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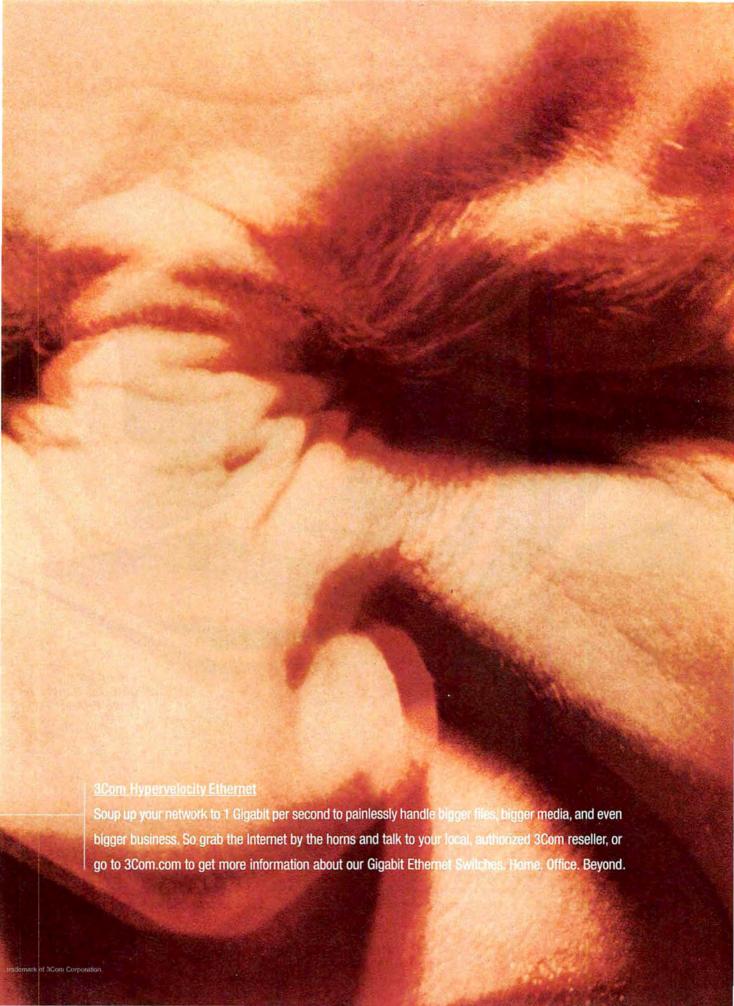
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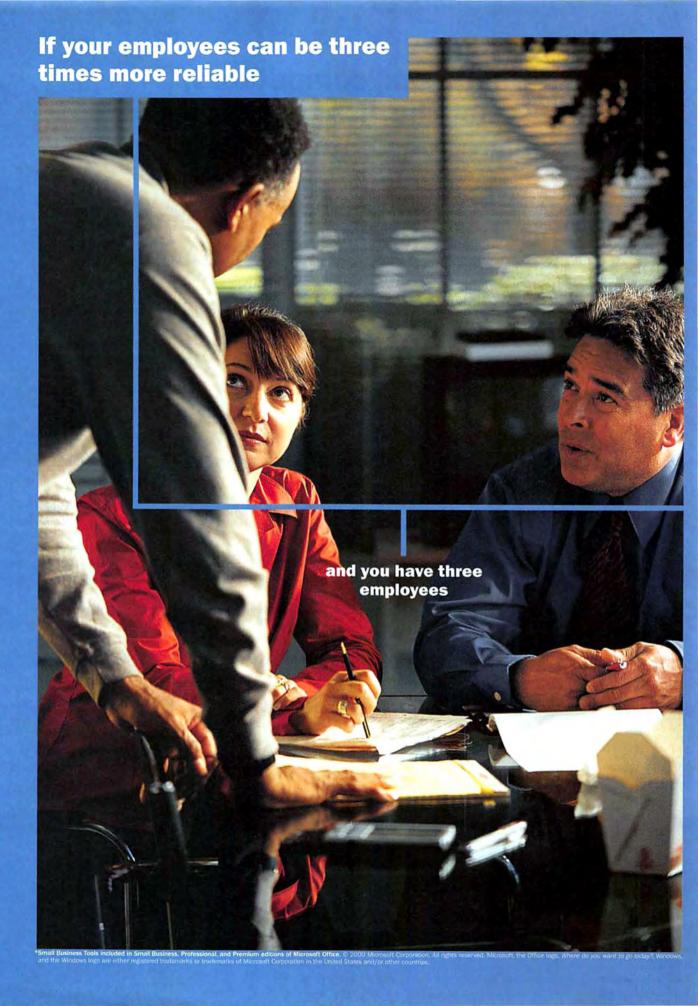
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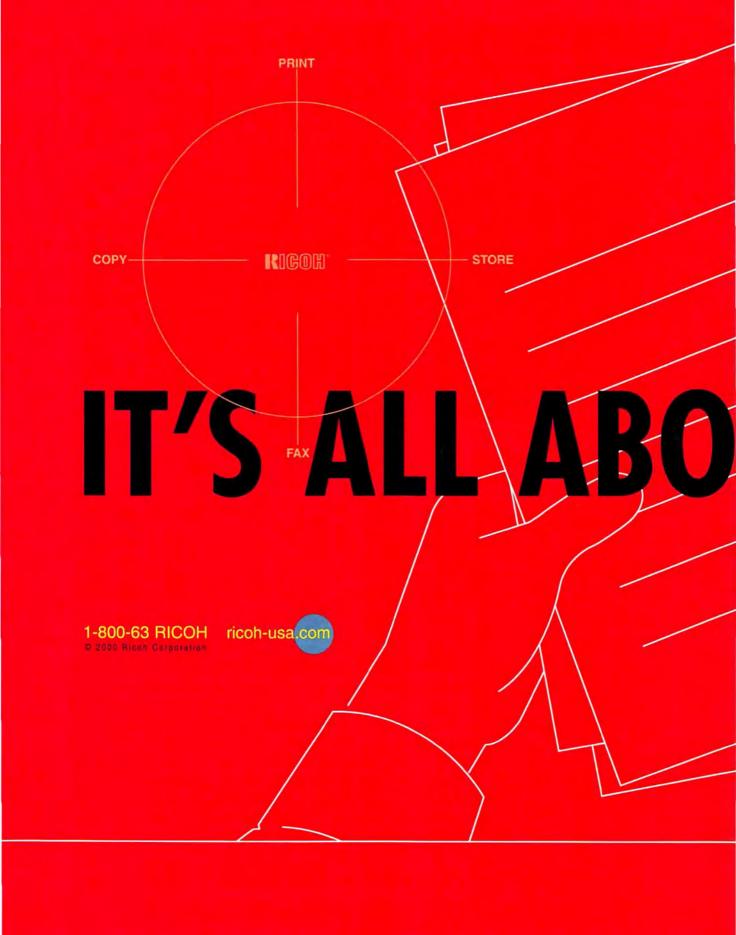


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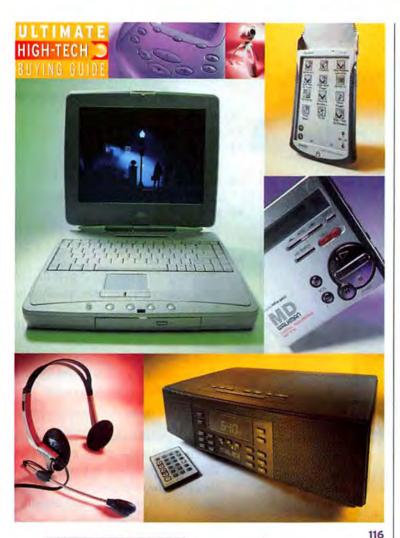
optional digital camera and countless other things

you'll want to snap up. Visit us online for availability.





VOLUME 18 • NUMBER 12



#### **COVER STORY**

#### 116 A FEW OF OUR FAVORITE THINGS

Glorious high-tech holiday gifts to please everyone on your list, from near-nerd to geek grand poobah. Here's a portable color bubble jet that permits you to print anywhere, a handheld e-book reader with built-in MP3 player, a PDA that lets you wear your address book on your wrist, an ultra-easy scanner, a globe-trotter's fantasy notebook-you get the picture.



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#### 135 POWER TO THE PEOPLE

HOME PCs Years ago, vendors treated home systems as an afterthought to business computers. But today, home PCs outsell their corporate cousins and match them in power and performance. We review 15 machines that deliver the goods for the new year and beyond.

#### 150 SHARP SHOOTERS

DIGITAL CAMERAS

If you've been looking for a digital camera that approaches the output quality and pricing of a film unit, we have good news: These products are better and more affordable than ever. We evaluate 15 models-including five priced at under \$500 and others with high-end featuresand find two Best Buys guaranteed to please the shutterbugs on your shopping list.

#### 177 GAMES GROWN-UPS PLAY

GAMES Just in time for the holidays, PC World editors survey the landscape of PC

games-from sports simulations to strategy games to trivia contests-and spot some winners to give to a deserving grown-up, like yourself. Find out what's hot this winter!

#### 191 VIRUSES: THE NEXT GENERATION

VIRUSES They'll be smarter. faster, sneakier, and more virulent online than before. But the worst thing about the coming generation of computer viruses, experts predict, is their infectiousness: You won't have to open an attachment to get nailed. We take a sober look at a scarily bug-infested future and at what the good guys are doing to help you fight back.

COVER Photography by Marc Simon

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N E W S Missteps and miscues have tarnished the chip giant's once-sterling image. We examine Intel's woes in depth.

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HOW-TO Want to learn the etiquette of the Internet age? We name the top e-mail faux pas and tell how to avoid them.

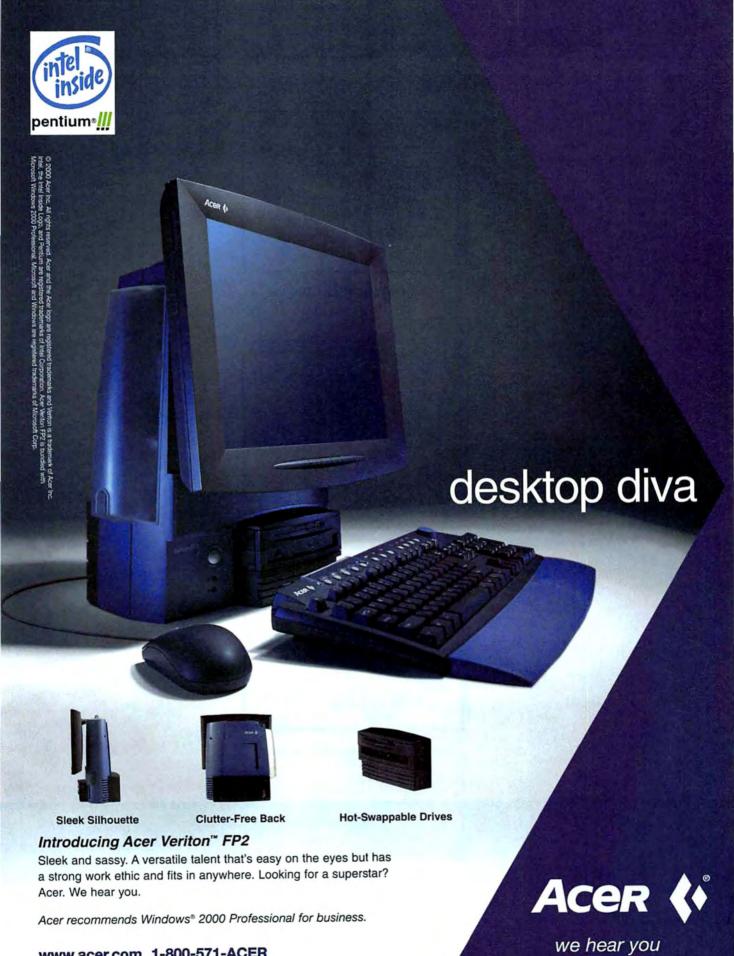
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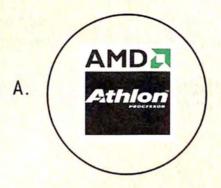
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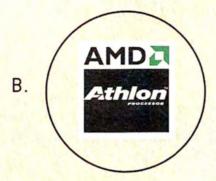
Adobe Photoshop 6.0

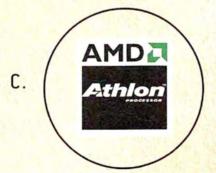


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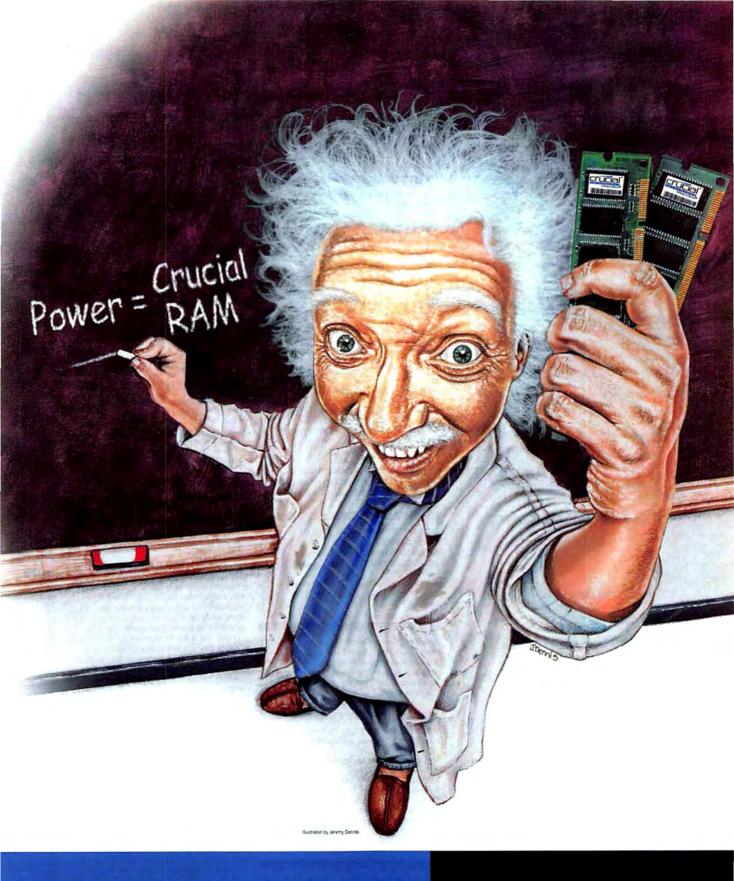
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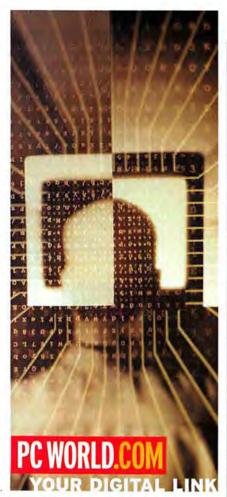
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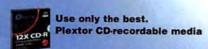
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Kevin McKean is editorial director of PC World.



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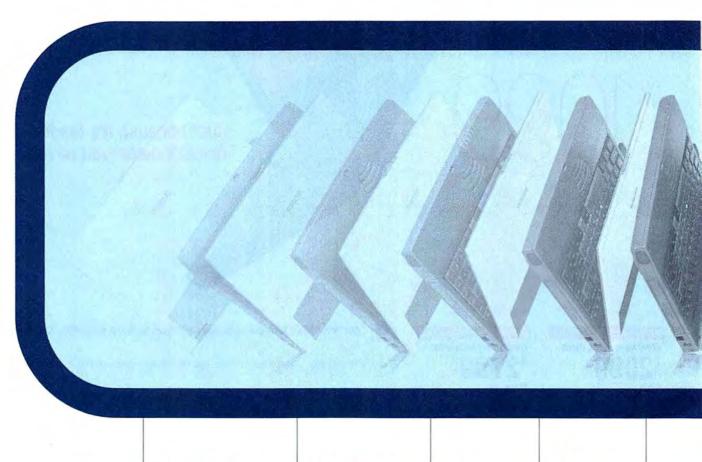
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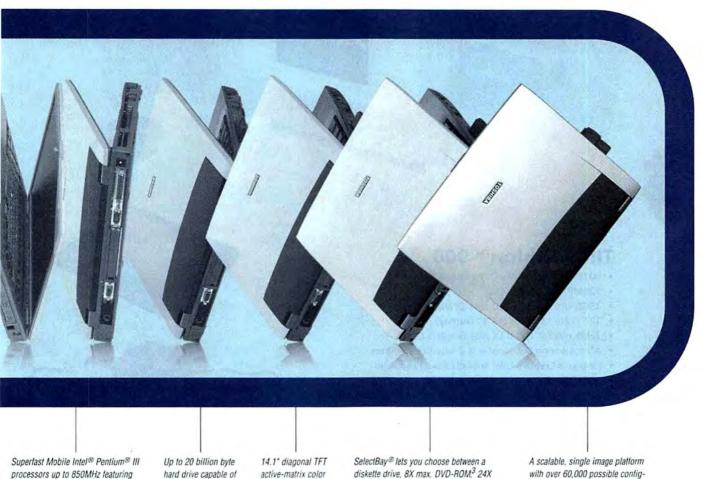
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#### YOUR TAKE ON: Registering Office • Backup habits • PC style • Wireless phones

#### **GOT OFFICE 2000?** PHONE TO UPGRADE

IF, AS OCTOBER'S Consumer Watch says, Office 2000's Registration Wizard indeed creates a unique identification code based on your hardware, how can I buy a new 1-GHz Athlon machine, say, and then install and run the software that I've already paid for? Does Microsoft provide a way for users to move software from an old machine to a new one?

Jim Wise, Palmdale, California Editor's response: We've received many letters like yours (see Hot Button, below). Yes, you can upgrade your PC and continue using your copy of Office 2000, but it may require a phone call, Microsoft says. If you upgrade your hard drive or other components, the Registration Wizard should realize it's still in the same system, according to Lisa Gurry, product manager for Microsoft's Office team. If you have problems, Gurry says, call the phone number in the Registration Wizardsupport techs will give you a code to continue using the software. You may also have to call if you replace your PC. -Ed Albro

#### DON'T TRIP OVER WIRELESS

"THE ULTIMATE Wireless Buyers Guide" [October] may have oversimplified a bit

when it says you don't have to limit yourself to a carrier's phones, "as long as you choose a phone that's compatible with the provider's system."

I bought a non-AT&T cell phone outside our AT&T service area. Although I checked with AT&T technical support to ensure that the phone would be compatible, it

could not be enabled. I finally learned that the Electronic Serial Number for the phone was not in the database of accepted ESNs for AT&T Wireless Services.

If you are going to buy a phone from a company other than the service provider, I suggest you first try to get the ESN of the phone and have your provider verify that the ESN is compatible.

> Fred Brown Dallas, Oregon

#### SAVE BACKUPS OFF-SITE

AS VP FOR A manufacturer of off-site storage units and an online backup provider. I appreciated "Hassle-Free Backups" [October]. The article correctly noted that online backups conform "to one

little-mentioned rule of backing up: You should always store backup media away from your computer."

It is frightening how few companies back up their data, much less do it on a regular basis; even fewer store those backups off-site. Many that do store them offsite have, shall we say, an interesting view of where to store them: in purses, trunks, glove boxes, dashboards, and the like. The business community-specifically, small businesses-needs to take more seriously the role backups can play in saving a company from disaster.

> Jerry Adcock Subterranean Data Storage Lewiston, Idaho

#### PCs AND STYLE

IN YOUR ARTICLE on "legacy-free" PCs ["Slim & Sexy," October], you quote a person as saying that styling amounts to false fronts on houses, and that the contents of the PC are more important. However, I think the issue has more to do with traditional industrial design than anything else. PCs are large, boring, noisy, dull machines. If PC builders really started to think about their design, we would >



HOT BUTTON

#### Registration Scheme Riles Readers

YOUR ARTICLE "Register Your Software-or Else!" [Consumer Watch, October] about Microsoft's now requiring Office users to register their software, adding a hardwarespecific identification code in the process, describes plain old copy protection, not registration. I want to be able to reinstall software at will on the same or another machine without jumping through Microsoft's hoops. In the future I'll use non-Microsoft products.

Joe Cointment, Dallas

WHEN A COMPANY promises not to market my registration information, I will feel a little more comfortable registering its software. It is hard to sympathize with companies' cries about software piracy when you fear they will market the information they are extracting. Ed Bell, Pittsburgh

IF MICROSOFT only wants anonymous registration of Office 2000, the company makes that hard to do. You may have to send in the registration card, which requires detailed information about the user. On my new laptop on which Office 2000 Pro came installed, I carefully checked Register Later under the Registration Wizard.

When I next opened Office to register it, no registration option appeared. The registration information I finally found said that if you didn't register the first time, you must send in the card or go to the Office Update site. That site clearly states you can't register there-you must use the card. Though the site has a link called Unable to Restart Registration Wizard, it proved unhelpful.

Stuart Haus, Springfield, Virginia

AS ALWAYS, the people most likely to get hurt by such policies will be the average, honest consumers-not the pirates and counterfeiters, who will quickly find ways around these protection schemes.

David R. Gipson, Austin, Texas

MICROSOFT, you're trying my patience. Maybe it's time to get an iMac.

Keith Piske, Westland, Michigan

not have to compromise between design and functionality or power. Think about the world around you-cars, houses, cameras, and watches are nearly always designed not only to be fully functional, but also to look good and be easy to use.

> Warren Johnson Noordhoek, Cape Town, South Africa

#### **ONLINE AUCTION RIGHTS**

IN THE ARTICLE on Internet auction scams ["Going... Going... Gotcha!" October], Nina Schuyler states, regarding bids, that "most sites will allow you to cancel [a bid] as long as you can give a reason." However, all sales transactions in the United States are governed by Article 2 of the Uniform Commercial Code, which states that a bidder in an auction may retract a bid at any time before the close of the auction, and the bidder has no obligation to justify the request.

Let me add that many auction companies, and corporations in general, post policies that highly restrict the rights of consumers but are directly contrary to statutory law. These corporations succeed in enforcing such policies only because consumers don't know their rights.

Karl Bateman, via the Internet Author's response: An attorney who specializes in Internet law tells us that parties can contract around the UCC, and that the UCC respects the freedom of individuals to bargain and create their own terms to a contract. She believes that the terms set between an online auction site and a buyerwho implicitly accepts the site's terms by participating in the auction-would trump the UCC. Exceptions to this usually involve terms that might be unconscionable under the law. -Nina Schuvler

#### NO PERFECT SEARCH ENGINE

IN YOUR SURVEY of search engines ["How to Stop Searching and Start Finding," September], I can't help but be a little upset at your conclusion that Google's search results have 100 percent relevance, while other engines that you tested, including Excite, had significantly lower percentages of relevance.

You state: "Google was less fortunate when we searched with the keywords world beat, hoping for information on music; the engine sent us to the Web site of travel publisher Rough Guides."

But this query-world beat-was one of your test queries for the actual scoring of results. It's listed as one of two examples at the bottom of the chart. So how could any search engine get a 100 percent score when it failed so clearly on one of the queries you had designed for this test?

Then you go on to state: "However, when we put quotation marks around the query ('world beat'), Google's luck (and ours) improved: It sent us to the highly relevant world beat page at the Internet Underground Music Archive..."

In other words, when this search produced a completely irrelevant link



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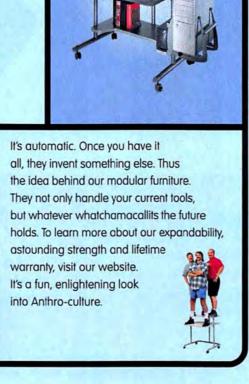
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#### LETTERS

right at the top of its results for one of your test queries, your reviewers changed the query to improve the results. The improved results are the ones you actually used in computing Google's score! But most real users probably wouldn't think of adding quotes to improve this query. And you did not write that any other search engine reviewed was offered the same second chance. If they were, then you would have noted that the top nine out of ten of Excite's Web results were about world beat music.

People who actually use Excite, Google, or any other search engine know that none of them is right all of the time.

Kelly Distefano Public Relations Manager, Excite@ Home Redwood City, California

Authors' response: We agree that no search engine is perfect, including Google. Our chart's ratings and relevancy rankings were based on specific queries performed at a specific time, while the paragraph you refer to was providing an example of what readers could do to improve their search results. The querying we described in this paragraph was conducted at least a month after the tests that were conducted for the chart. We should have made it clearer that we retested the world beat query at a later date; all search engines deliver varying results as their indexes are updated.

-Kim Zetter and Harry McCracken

PC World welcomes letters to the editor. Send e-mail to letters@pcworld.com. We reserve the right to edit letters for space.

#### CORRECTIONS AND CLARIFICATIONS

IN OCTOBER'S "Ultimate Wireless Buyers Guide," our features comparison chart for wireless services should have listed Cellular One and MCI WorldCom as using TDMA networks. Also, not all digital plans offered by Verizon Wireless come with free voice mail.

In the print quality samples chart for "New Ink Jets Offer Big-Ticket Quality at Low Prices" (October Top of the News), we neglected to point out that the left-hand picture in each pair shown was printed on plain printer paper and the right-hand picture on high-quality glossy photo paper.

PC World regrets the errors.



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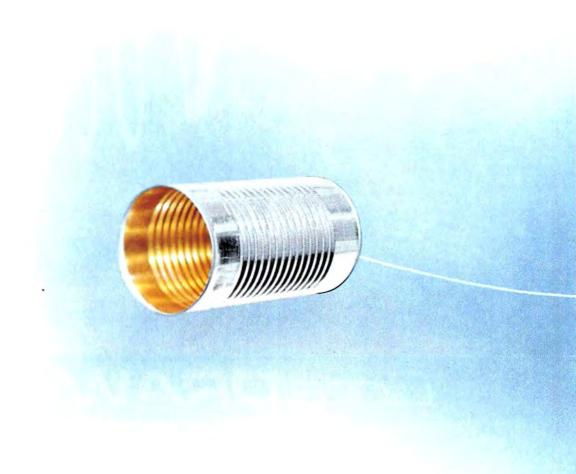
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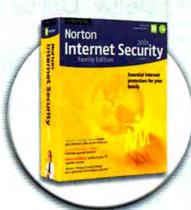
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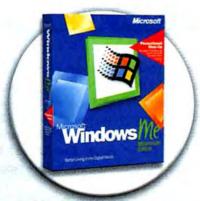
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# Help Without the Hold Music

Companies are pushing you to drop the phone and get tech support online instead.



MY PC VENDOR cares about me. I know this because I just got off the phone with its tech support department, whose recording earnestly assured me that my call was important-128 times. Sure, my PC continues to display cryptic error messages. And I've spent more than an hour with the phone pressed to my ear, never even reaching a real human being. But it's okay, because the folks that made my PC are concerned—in their own automated way.

Sound familiar? It's no secret to PC owners that most vendors simply don't have enough technicians sitting by telephones to meet consumers' needs. Smart hardware and software vendors recognize

that fact, and they also know they have to do better by their customers if they want their loyalty. But the vendors are in a bind. If they hired all the phone support techs they needed, the prices of their products would climb so high that few people would buy them in the first place.

#### THE WAY OF THE WEB

ENTER-WHAT ELSE?-the Web. More and more companies are bolstering their online support systems and trying to nudge-in some cases, shove-customers off the phone and onto the Internet for help. The Web approach saves companies money and, they say, gets customers better advice quicker.

Some vendors are taking an aggressive approach toward getting their customers to hang up and log on. Microsoft, for instance, recently announced that it will limit users of Win-

dows 98, Windows 2000, and the latest versions of Office to free phone support for only two problems. After that, customers must pay \$35 for each headache they call about. And users of Office 95 and Windows 95 who want free help will have to go to the Web from now on, Microsoft says. Symantec has dropped much of its free phone support, too. You can still get a phone technician to help you install the software, but for questions beyond that, you must either get your answers

online or pay for help over the phone. If your PC becomes ill, these companies argue, your browser may already be the best path to a cure. Suppose your machine is giving you indecipherable error messages on start-up, as mine did. And suppose you don't have the time-or the patience-to wait on the telephone. In the brave new world of online support, you'd simply e-mail a description of your problem to the vendor. A "snapshot" of your PC, including its model, its configuration, its drivers, and the names of any added software would automatically be sent to an unseen support rep. The tech would analyze the information, run it through a database of other reported problems, and provide you with a software fix. End of problem-in theory, anyhow.

This is the vision shared by a number of leading PC hardware and software manufacturers. Some, such as Micron and Dell, have already implemented sophisticated online troubleshooting and analysis techniques.

The approach certainly has its merits. But

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# CONSUMER WATCH

before vendors rip out all their phone lines, they should remember a few of the things phone support does well. Like providing answers when a customer's PC is too sick to access the Internet. Or tailoring information to the technical knowhow of the caller. Besides, some problems are the manufacturer's fault. We consumers shouldn't have to pay a fee to let Microsoft know about a bug in its software, even if we dare to pick up the phone.

Consumers I spoke with had mixed feelings about online tech support. Most expressed cautious optimism about the prospect of resolving problems without facing telephone queues. But some, like Bill Payne of Wilmington, North Carolina, have found little satisfaction. Despite e-mailing Compaq tech support numerous times, Payne is still waiting for a solution to a problem with his Presario. "I've received three responses from Compaq," Payne says. "The first was a solution that didn't work, and the others were requests to resend the original message."

#### ONLINE IS CHEAPER

WHAT'S DRIVING the trend toward online tech support? Ask the companies, and they'll say that their customers are demanding it. "Customers want the ability to get the information they need when they need it," says Genevieve Haldeman, Symantec's group manager of corporate communications. "Already more than 80 percent of our customers rely on the Web site for support, and the average customer finds a solution to their problem in less than 3 clicks or 5 minutes."

But the shift toward online support isn't purely altruistic. Cost plays a major role. It's cheaper for companies to receive tech support questions online than it is to pay an army of tech support professionals to field calls 24 hours a day, seven days a week. It's also more efficient: Automating the collection of basic information about your system saves you and the support person time and makes it easier to maintain a central database of problems and their solutions. And finally, responding via e-mail is usually quicker for the tech than talking a customer through a fix.

That's why online tech support makes

sense, says Bill Rose, founder and executive director of Supportgate.com, a source of information for tech support professionals. "Chances are, if you have a question, someone else has already asked it. Why not reuse that information?"

#### GOOD-BYE, TELEPHONE?

MOST COMPANIES probably won't eliminate telephone support any time soon. "It's partly a mindset issue. There will always be some customers who are more comfortable talking to a live person," says Ana Volpi, senior analyst of software support and integration services at International Data Corporation.

But companies are trying to coax users online with new tools. By the time you read this, Dell will have launched what it calls Resolution Assistant for the company's Dimension and Inspiron lines. One feature of its new troubleshooting system lets users connect online to a Dell technician. Resolution Assistant automatically provides the tech with the PC's original configuration; if the user agrees, the technician can also upload information about hardware and software subsequently added to the machine. The user describes the problem in an online chat. Often, if a software conflict or a driver problem exists, the technician can download a solution directly onto the malfunctioning machine-with the user's permission.

Micron has already implemented a similar system at its Connectedsupport.com site. And Gateway planned to have a remote diagnostics system in place for its business customer division by the time this article sees print.

Will Web-based tech support live up to the industry's breathless assurances? Initial signs look promising. But customers are so fed up with being on hold, almost anything would be an improvement. The bottom line is whether you can find the information you're looking for in a timely way. Companies must prove themselves by providing fast, accurate, and customized online support for their customers, not just by hanging up the phone.

Anne Kandra is a contributing editor for PC World.



# Share your world."

My friends said I would never do it. "Fly through the air with nothing but a little cord strapped to your ankles? We think not," they said. Well, I showed them.

I scanned my bungee jumping photo onto the computer with my UMAX AstraNET™ scanner and posted the picture to my new Web page. My friends couldn't believe their eyes. Now they're asking how I learned to be a computer techie overnight. Little do they know... that was the easy part.

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AstraNET scanner, you can

still create newsletters, greeting cards and color copies from your scanned images, just like a regular scanner, but you can also do so much more.

All AstraNET scanners come with a free ISP, Web building software and 50MB of Web storage on ImageOL.com\*. With this complete Web kit, you can build your own Web page and have your scanned pictures online, ready for viewing in a few simple steps. Sharing your life with friends and family has never been so easy. For more information, check out www.UMAX.com.

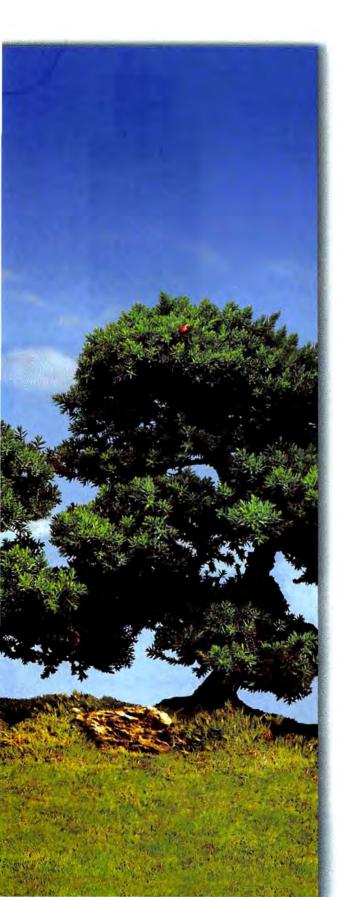
Share your World.

It's your Web."



■ With ordinary printers, you see the trees.







The ladybugs are the clue. See all six? Of course you do. And once you have, you realize what you thought were giant trees are actually small bonsai. Thanks to a tiny detail, the whole picture changes. It's just one example of the extraordinary image quality you get from an Epson printer. With 2880 dpi, there's no color or nuance so subtle it goes unnoticed. And just as you see here, it's those quiet little things that often speak the loudest. Only Epson color ink jet printers have: 2880 x 720 dpi • Micro Piezo technology, for a cleaner, smaller droplet - as small as 3 picoliters • Fast print speeds — up to 13 PPM black/ 10.5 PPM color (with the Epson SC 980) • Quick-drying inks • PC/Mac/USB compatibility. And remember, only Epson supplies guarantee Epson quality. For more info, call 1-800-GO-EPSON or visit www.epson.com.

Epson Stylus Color Ink Jet Printers. Sheer brilliance starting at \$99.



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# Can your palm do that?





# Not unless it's holding a **Pocket** PC.

Get the picture? With an HP Jornada Pocket PC, the Internet can be yours-with graphics in rich vibrant color\*. Because all Pocket PCs include a pocket version of Microsoft® Internet Explorer, you can turn your favorite web sites into "Mobile Favorites" to view offline at your leisure. Or with the addition of a Pretec CompactModem PocketPak (pictured above, sold separately) you can input any web address you like and browse live, shop securely or do business online\*. The easy, expandable and versatile Pocket PC, it's more than just an organizer!

Learn more at PocketPC.com



\*Some web site content may be unavailable. Connect time charges may apply, check with your ISP.

# When Your PC Vendor Vanishes

THE COMPLAINTS STARTED in midsummer: A few customers of mail-order PC vendors CyberMax and Quantex wrote to report difficulty reaching both companies. By late August, I had heard from hundreds of angry Quantex and CyberMax owners, all with similar tales of woe.

Judith Grizanti of Liverpool, New York, was a typical victim. "My CyberMax PC stopped working in July, and since then

I've spent hours listening to a recording that assures me that my call is extremely important. I have sent e-mails and faxes, and written to the company's presidentall to no avail."

CyberMax and Quantex wouldn't talk to us, either. Eventually, we learned that their closely allied supplier, Fountain Technologies, had filed

for Chapter 11 bankruptcy (see November Top of the News, www.pcworld.com/ nov2000/fountain\_bankruptcy). This form of bankruptcy lets a company continue operating while it reorganizes its finances. But that's little consolation to customers such as Grizanti.

Can't get a satisfactory response from a PC vendor? Submit complaints to the Better Business Bureau (www.bbb.org), to

> your county consumer affairs office, and to the attorney general of your state. You can obtain contact details at www. pueblo.gsa.gov.

> There's no guarantee that even a well-known vendor won't vanish unexpectedly, but you can nudge the odds in your favor before you buy. Research the company in question thoroughly.

Check consumer-opinion sites such as Deja.com for recent customer feedback. If the company is public, you can obtain financial facts at Company Sleuth (www.company.sleuth.com). For private companies, Companies Online (www. companiesonline.com) can provide a Dun & Bradstreet report for less than \$25.





UBid Shipper Shock: After winning a bid on a \$15 speaker system, a reader authorized payment and was stunned to find a charge of nearly \$20 for shipping and handling-on top of the \$15 for the speakers. When he complained, he was told, "All sales are final." UBid representatives report that customers now see full shipping and handling charges before they place a bid. Good idea. Too Little, Too Late at Microworkz: One of the many folks who was burned by cheap-PC vendor Microworkz last year reports that he recently visited the company's Web site (www. microworkz.com) and was surprised to find a link for refunds. The reader sent in a request and was offered an EMachines PC worth \$500. When I contacted Microworkz, I was curtly told that the offer is "not official" and won't be offered to everyone who lost money to Microworkz. The reader says he doesn't want the EMachines unit, just his \$1500 back. Diamonds Aren't Forever: One-time industry leader Diamond Multimedia/S3 has discontinued its graphics board line in order to focus on Internetrelated and wireless devices, such as its Rio MP3 players. The company will continue to provide full support and warranty coverage for its graphics boards. For more information, visit www.diamondmm.com.



# LETTER OF THE MONTH

I BOUGHT A hard drive and a controller card from an online vendor that I had never heard of. Upon receiving the shipment, I saw that the company name and address on the box weren't those of the online store I had ordered from. The packing list lacked a company name and contact information. The drive and card

were packed in unmarked boxes; neither item included a warranty card. and the drive lacked any documentation. Did I purchase stolen goods?

> Richard L. Wiringa Middleton, Wisconsin

## GOTTEN A RAW DEAL?

Or a great one? E-mail the details to onyourside@ pcworld.com. We'll investigate and publish items of the broadest interest. Anne Kandra is a contributing editor for PC World.

On Your Side responds: The vendor may simply be passing orders to warehouses (which would explain the different address). But some shady sites sell equipment that's refurbished, obsolete, or meant for sale overseas (meaning it could support standards that make it unusable in the United States). Before you buy from an unknown vendor,

> check it out. Look for a street address and a phone number. Ask about return policies, and get warranty details. If you still have doubts, contact the item's manufacturer and ask whether the site is an authorized reseller.

# introducing the PC camera with a split personality.

→ inside it takes on the identity of a PC webcam and goes by the name of the Intel® Pocket PC Camera. attach it to your PC and record video and still pictures, you can make live video phone calls, create video e-mail or share images on the web.

→ outside its alter ego is a digital camera but still goes by the name of Intel® Pocket PC Camera. it fits in your pocket and goes anywhere you go so that you can take still photographs or record live video to share on the web. to learn more go to → intel.com/pccamera/2in1)

intel.

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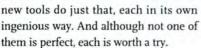
intel

# Better Ways to Browse the Web

IT'S LIKE Winston Churchill said: The Web browser is the worst way to navigate the Net...except for all the others. Well, okay, he was really comparing democracy to other forms of government, but you get the idea. Internet Explorer and Netscape Navigator have faults aplenty, but

ultimately, they work.

Maybe that's why so many radical alternatives to browsing have died on the vine. (Anyone remember Microsoft's Active Desktop?) But while trying to replace the browser seems to be a fool's errand, reinventing it is another matter. A bunch of





RIGHT NOW, I'm perusing a single Web page bursting with news from the Washington Post, the Times of London, CNN,



NBC, and my hometown paper. I engineered this media megamerger myself, thanks to Quickbrowse.com. This site stitches Web pages together into a single, extralong page you can browse or receive via e-mail. You can piece together one of these pages out of

any set of URLs you specify (which is what I did), or choose sites from readymade lists in categories such as business, stocks, entertainment, and comic strips.

In short, a Quickbrowse page is an allyou-can-eat content buffet piled high with stuff from your favorite sites. The infoglutton in me loves to dig in. Still, it takes a lot of scrolling to traverse a megapage

# New on the Net...



Names for Nothing: So it's official: You've decided to claim the domain name www. LegalizeFerretsNow.com for your new site. Until recently, you'd have needed to pony up a registration fee (usually \$70) to make it your own. But now a trio of competing sites-DomainZero.com, NameDemo.com, and Namezero.com-will register any available domain name for free. But Name-Demo and Namezero place ads on your site, and DomainZero makes you accept emailed "promotional offerings" from 18 (!) sources... That's Mister Spam Victim to You: Lately I've been besieged by a new breed of spam: Messages with subject lines that jauntily address me by name, as if they were from a buddy. ("Harry, Check out these auctions from Egghead.com!") The goal, presumably, is to get me to take a second look before I reflexively drag them into my trash folder. (It works.) Among the offending dot coms: ECircles, Egghead, and Quickdot.

that consists of three, four, or more Web pages in their entirety. That's even more true when those pages are already larded with text, graphics, links, and ads.

So ultimately, I prefer the pickier approach that Octopus (www.octopus.com) permits. Maybe all you really need from Lycos's superbusy home page is the search box. Fine-just grab it (using a button that Octopus installs on your browser) and plunk it on a custom page. That page (a view, in Octopus parlance) can also contain bits and pieces of content from all over the Web-weather forecasts, sports scoreboards, news headlines, and anything else you care to snag. Views have a refreshingly minimalist feel, since they consist entirely of items you've chosen, and Octopus tends to strip out ads, colors, and graphics. (Click a link you've

# GIMME FIVE

# Top Sites for News You Can't Use



PULITZER, SCHMULITZER! The breaking news at these entertaining sites is insignificant, offbeat, and occasionally downright fictional.

- 1. News of the Weird: Ever hear about the time the SkyDome's hot-dog cannon went berserk? It's all in a day's news at this Web home for Chuck Shepherd's long-running column. www.newsoftheweird.com
- 2. Modern Humorist: Deadpan satire on politics, culture, and society at large; more consistently clever than the better-known Onion, www.modernhumorist.com
- 3. Page Six: The celeb watchers at the New York Post dish out gossip galore, paparazzi pictures, and other trashy, tabloid-style delights, www.pagesix.com
- 4. The Good News Network: Come here for relentlessly cheerful reporting that celebrates "the glorifying, not the horrifying." www.goodnewsnetwork.org
- 5. Weekly World News: Coming to you straight from the checkout aisle, America's strangest tabloid provides psychic advice and updates on the legendary Bat Boy of West Virginia. www.weeklyworldnews.com

included in your view, though, and Octopus launches a new browser window and dumps you at the originating site.)

Octopus users have published scads of views for public consumption, most of which pull together disparate content on a single topic, be it alien abductions or Ziggy Marley. But as far as I'm concerned, the best way to use Octopus is to weave together subjects that have nothing in common, except that you're interested in them. (My favorite view combines stuff on old wristwatches and Burt Bacharach with the contents of my Yahoo Mail in-box.)

The Web was never meant to be so malleable, so it's a wonder that Octopus works at all-and truth to tell, it only works most of the time. Sometimes I can't pry a Web element loose from its originating page: other times elements don't function properly after I've deposited them in a view. And even when Octopus operates as advertised, it still requires some studying and fiddling.

The same caveats apply-only more so-to a couple of its rivals. OnePage (www.onepage.com) resembles Octopus in feel and features, but it's a tad less flexible and less intuitive overall. Meanwhile. DataBites (www.databites.com) is stuffed with tantalizing tools: It can display bitesize chunks of Web content in unobtrusive desktop windows, and shuttle those content chunks to a PDA or Web-ready cell phone. The beta version I tried was certainly promising, but also tricky to figure out and prone to crashes. (Check the DataBites Web site to see if a more polished update is available.)

## ALL-IN-ONESPACE

FINALLY, THERE'S Enfish's Onespace (www.enfish.com). Part personal information manager, part file manager, and part browser, this free, exceptionally powerful Windows application herds together Web pages, office documents, contacts, e-mail messages, appointments, and

SO LONG, SNAIL MAIL? In a new survey, 80 percent of respondents say that e-mail has replaced postal delivery for most of their business correspondence.

SOURCE: VAULT.COM

probably some other items I'm forgetting right now. It does all this via bookmarklike links that tie related items together via multiple tabbed windows.

Onespace does many things that traditional PIMs can't. However, the sheer range of its features can prove daunting, and its idiosyncratic interface doesn't help. So at times, I have to agree with Churchill's verdict: Onespace is a riddle wrapped in a mystery inside an enigma.

All right, he was really talking about Russia. But you get the idea.

E-mail PC World Executive Editor Harry McCracken at websavvy@pcworld.com.



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# **Business Moves Way Too Fast**

# FireWire/1394 Helps You Keep Up

In this fast-paced world of long hours and impossible deadlines, we have designed a new line of scanners that won't slow you down. Introducing the FireWire/1394 scanners from UMAX. Up to twice as fast as a typical SCSI scanner, the FireWire/1394 interface provides blazing fast scan speeds—and with three models to choose from, there is something for everyone.

The Astra 6400 features 600 x 1200 dpi resolution and 42-bit internal color. It includes Adobe Photoshop LE and

a FireWire/1394 PCI card for Windows PC users. The Astra 6450 has the same great features plus we've added a transparency cover for scanning transparent media. And, for creative professionals, we have the PowerLook 1100, achieving a high 3.4 Dmax and 1200 x 2400 dpi resolution. With the PowerLook 1100, you get a transparency adapter with auto detect slide holders for auto cropping and a choice between six different software bundles. For more information, check out www.UMAX.com.

# We wrote the book on home networking.



The company that invented consumer networking has written the definitive guide on the subject. This booklet explains everything you need to know about sharing a broadband high-speed Internet connection — and the benefits and how-tos of networking your home or office. This handy guide is easy to read and understand, and features lots of photos and diagrams.

And it's yours free, just for asking. Simply visit SOHOware online at: sohoware.com/offer.html. Get your copy today while supplies last. Then check out SOHOware's complete line of home networking products at the stores featured here.













# Keep Web Snoops at Bay

LET'S SAY YOU invite me over for dinner. While you're busy in the kitchen, I'm hiding eavesdropping devices by the TV, next to the mail slot, and under the bed. Once I'm gone, I observe your behavior without your knowing it. You think this is a little far-fetched, right?

Nope, something similar is likely happening right now via your PC. You're going to be ticked off when I describe how companies and individuals trample on your privacy. Rest assured, I know of a few nifty tools to combat these invasions.

A show of hands: How many of you use GoZilla, RealPlayer's RealDownload, PkZip for Windows, or GetRight? Adsponsored versions of these and similar programs are often called spyware. Such programs put tracking applets on your PC to manage their ads. Even if you uninstall the programs, the tracking applets may stick around, passing data about your computing habits back to their servers.

For a better understanding of the spying problem, visit Steve Gibson's site at grc.com/optout.htm as well as his privacy newsgroups at grc.com/discussions.htm. Then grab a copy of LavaSoft's AdAware from PCWorld.com's Downloads (the company's site is at www.lavasoft.de). This excellent freebie detects, reveals, and removes most spyware applets.

## **WEB BROWSERS ANONYMOUS**

I KNOW AN EASY way to become invisible to Web sites and protect myself against nasty Web bugs (more on those beauties below). I just raise my privacy shield with Zero-Knowledge's \$50 Freedom software, which routes my e-mail,

#### Freedom

\$50 list, Zero-Knowledge, 877/691-3733 www.freedom.net



# Hackers can read our e-mail as easily as they can peruse the morning paper.

my Web and newsgroup browsing, and my IRC chats through anonymous servers. When you read my Freedom mail or find me on your Web site, you won't get any trace of the real me. For more info on this crucial subject, see last March's Top of the News article, "Hide Your E-Mail Tracks With New Privacy Tool" (www.pcworld. com/mar2000/e-mail\_privacy).

Web bugs are undetectable bits of code planted in e-mail messages, mostly by spammers who send lots of mail simply to verify that e-mail addresses in their possession are valid. Once you view or open a piece of booby-trapped e-mail, a hidden receipt immediately wings its way back to the senders. The bug also lets the senders determine your e-mail address and track you if you surf their site. To see a Web bug in action, go to www.mackraz.com/ trickybit/readreceipt-and be ready for an unpleasant surprise. Then load the trial version of Freedom (available at PCWorld. com's Downloads), try it again, and watch the bug get blocked. For more facts about Web bugs, visit Richard M. Smith's privacy site at www.privacyfoundation.org.

#### AS PRIVATE AS A POSTCARD

IF YOU DON'T think the Net makes theft of financial and other personal data easier, visit the Federal Trade Commission's site on ID theft (www.consumer.gov/idtheft).

If you're a victim, call the FTC's Identity Theft Hotline at 877/438-4338. We provide many details about ourselves to Web sites we visit and in e-mail we send. With the right tools, hackers can view our personal information stored on Web servers and read our e-mail messages over the Internet as easily as they can peruse the morning paper.

I don't keep every e-mail message I send private, but I consider sacrosanct messages to my doctor, CPA, broker, and barber (who keeps my Grecian Formula secrets). I use Sigaba, a program that encrypts my e-mail and embeds a

unique key to identify me. The only people who can read the messages are those I send them to. Sigaba is free, easy to use, and unobtrusive once it's configured. The program integrates with my e-mail package's menu bar. When I reply or send a new message, I can encrypt it with a click on the Sigaba icon (see "Sigaba Enhances E-Mail Security" at www.pcworld.com/ news/sigaba).

To read encrypted e-mail, you must register with Sigaba at www.sigaba.com. You can avoid installing the program by receiving all of your encrypted messages on the company's Web site. I can use my existing e-mail account, add attachments, and restrict when others can read the messages I send. The service supports most mail programs, but it didn't work with AOL as we went to press.

Excuse me, but I must run. We had some guests over for dinner tonight, and I need to do a quick check for bugs.



You'll find files mentioned in this article at www.pcworld.com/ downloads. PC World Contrib-

uting Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached at steve\_bass@pcworld.com.

# Nikon Melds Optics From Mustangs and Digital Technology in Coolpix Cameras

Bruce Dale loves to talk about cameras. If only he had more time to talk. "A herd of 100 horses just raced by my window a moment ago," says a distracted Dale, from his first-floor motel room somewhere in the desert Southwest. "I think I know where they're going. I'm going to ask the ranchers if we can follow them for a while." After 30 years exploring the planet for National Geographic, Dale is finally his own man, taking pictures for photography magazines and commercial clients.

Even before starting his successful freelance career, Dale amassed an enviable list of awards and accomplishments. The National Press Photographers Association twice tapped him as their "Magazine Photographer of the Year," and the White House News Photographers Association once named him "White House Photographer of the Year."

## PASSING THE TORCH

Dale combines digital and traditional tools when he teaches his craft to shutterbugs among the cottonwoods at the Pecos River Cabins Retreat (pecosrivercabins.com) near Santa Fe, N.M. He encourages his students to be "ready for the unexpected," as he leads them through Hispanic villages and the ruins of the Pecos Pueblo, through ponderosa pines and high desert locations.

As a professional mentor, Dale offers an opportunity for all of his students to try his digital cameras, which he uses for ad work and for photo-illustrations, as well as for his personal portfolio. "My digital cameras have replaced my [instant camera] for sure," he says. Dale also uses digital cameras to take photo-

> them to get instant feedback on their photographic exercises and assignments. "[Digital cameras]

graphs for stock libraries, while his students use



are excellent for scouting loca-

The Coolpix digital cameras: the 990, above, and the 880, right.

Nikon



"The [Coolpix] 990 does a super job with closeups...In this picture, these infinitesimal beads looked beautiful, like pearls on a necklace."-Bruce Dale

tions and setting up shoots," Dale adds.

Until recently, that's all digital cameras were good for-providing an "assist" to traditional methods. "The resolution [of the cameras] never reached a level that made them useful for full-sized, print reproduction," Dale says. He recently added a new tool to his picture-taking arsenal: a Nikon Coolpix 990. His comment: "For the money, I have to say that this is a spectacular camera."

Nikon leverages its reputation for award-winning photography throughout its Coolpix series digital cameras, from the consumer-level Coolpix 880 to the more advanced Coolpix 990. The Coolpix 990 incorporates a 3x Zoom-Nikkor lens (that's a 35mm-equivalent coverage of 38mm-115mm) with 4x step-less digital zoom. The camera boasts a shooting range from 11.8 inches to infinity. In addition, Macro mode on the Coolpix 990 can focus 0.8 inches from a subject. "The



Kayaking in Cohasset, Massachusetts, taken with the Coolpix 990 camera.

990 does a super job with close-ups," Dale says. The photographer took advantage of a recent foggy morning to catch water droplets clinging to a spider's web. "In the picture, these infinitesimal beads looked beautiful, like pearls on a necklace."

Dale could not have achieved that delicate image without the 990's incredible image quality. The Coolpix 990 and Coolpix 880 each yield clear, sharp pictures at resolutions up to 2048 x 1536 pixels, for prints 11"x14" or greater. Furthermore, both cameras can capture up to 40 seconds of QVGA-size motion picture images at 15 frames per second. Coolpix 990 users can store up to 40 images at full resolution (2048 x 1536 pixels, basic jpg) on the camera's 16MB Lexar Media CompactFlash™ (CF) Card, while the Coolpix 880 ships with an 8MB Lexar Media CF Card. Any Coolpix user can purchase optional CF Cards of any size. Storage sizes currently go up to 256MB.

#### **FUSION OF ART AND SCIENCE**

The veteran picture-taker credits the Coolpix 990's state-of-the-art digital technology for making his spectacular images possible. "Its automatic white-balancing and exposure-metering options often make my life a lot easier," Dale says. In fact, the Coolpix 990's electronic shooting menu includes white balance, metering, image adjustment and sharpening. Plus, the Coolpix 990 and the Coolpix 880 each feature Nikon's Best Shot Selector, which captures con-

SUPPLEMENT SPONSOR:

Nikon Inc. www.nikonusa.com secutive shots, chooses the image with the sharpest focus, and discards the rest to save CF Card storage space and to streamline the editing process.

His magazine experience may predate desktop publishing by a quarter of a century, but Dale is an Adobe PhotoShop expert. Coolpix 990 and 880 cameras are USB-ready and fully functional with Microsoft Windows™ 98, 98SE and 2000, and with Apple MacOS 8.6 or later. Users of Windows 95/Windows NT 4.0 or Macintosh 8.1 or earlier will need to purchase a serial cable to use the Coolpix 880 or Coolpix 990. Nikon bundles its own Nikon View software with the Coolpix series, plus Altamira Group's Genuine Fractals™ 2.0 LE for scaling images, Internet Picture's iPIX for immersive imag-

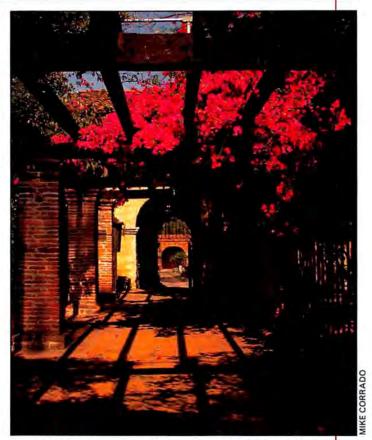


Image taken in San Juan Capistrano at the Mission with the Coolpix 990 camera, using Nikon's exclusive Matrix Metering in the Program exposure mode.

ing, Software Architects' Great Photo!™ for image manipulation and correction, plus Cantos Cumulus™ 5 demo version for image organization.

#### HARDWARE COMPLETES THE PACKAGE

Dale is also hooked on Nikon's optical hardware. "Nikon's history," he says, "gives the company a leg up on other digital camera makers." Experienced photographers will appreciate Nikon's optional lenses for the Coolpix family. Options range from the high-quality ED glass in Nikon's 3xTele-Converter lens, to the expanded coverage from its Fisheye and Wide-Angle Converter lenses, to a 2xTele-Converter lens.

Nikon offers a number of external flash accessories for the Coolpix cameras, including an external multi-flash bracket unit and flash adapter. The optional remote cord (MC-EU1) for the Coolpix 880 and Coolpix 990 enables features such as remote shutter release, zoom setting, interval shooting and playback. And Nikon's optional slide/film copying adapter (ES-E28) copies 35mm-format positives and negatives directly to the Coolpix 880 or Coolpix 990.

Casual users and professionals alike enjoy an array of accessories that is rare for any other digital camera system. Dale says photographers should settle for nothing less. "That's the kind of flexibility you'll need to get dynamite pictures from your camera."

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E

IE holes • Fastest PCs lose data • Two new Palm viruses • Hotmail hogs MSN Explorer

# Security Holes Put Online IDs at Risk

IF YOU'RE NOT the type of person to pounce on every single Internet Explorer update, here's something that might change your mind: A security hole in older versions of IE could expose your identity if you use Web-based services like Hotmail. The problem is actually a new way to exploit an old security hole in IE versions 4.x through 5.01. The danger? A mischievous surfer with nothing better to do could steal the cookie that identifies you, at sites such as Hotmail, and masquerade as you. That means

The vulnerability only affects sites, including Hotmail and Yahoo Mail, that use cookies as a way to immediately identify users, saving them the hassle of entering a user name and password each time they log on. Fortunately, most sites-in particular most e-commerce sites-don't use cookies to authenticate users like Hotmail and Yahoo Mail do. So you don't have to worry about this vulnerability at any site that requires you to type in a user name and password to enter secure portions of the site.

someone could send and receive e-mail through your account.

Microsoft says it has fixed its browser to stop an intruder from stealing cookies. So if you didn't upgrade Internet Explorer last time, do it now. To get the fix, download IE 5.5 from microsoft. com/windows/ie/download/ie55.htm. Alternatively, you can install IE 5.1 Service Pack 1, available at microsoft.com/windows/ ie/download/ie501sp1.htm.

#### LATEST PCs TOO FAST FOR COMFORT

IF YOU THIRST for speed, remember what you learned in driver's ed: Speed kills. And in the case of the hottest new computers on the market, speed could kill your data. Microsoft recently

# MSN Explorer Banishes Outlook Express

IF YOU DOWNLOADED Preview 2 of Microsoft's new Internet software, MSN Explorer, you may have run into an unpleasant glitch: MSN Explorer kicks out Outlook Express and installs Hotmail as the default e-mail program. Currently, as soon as you accept the enduser license agreement, your e-mail program is converted to Hotmail. Microsoft has promised to fix this problem so that you can tell MSN which e-mail program you want (Outlook Express is the only program bumped by the glitch). The fix should be available by the time you read this. For details, go to preview.msn.com.



# More Viruses Threaten Palm Devices

LAST MONTH WE reported on the Liberty Crack Trojan horse, which attacks Palm OS handhelds. McAfee.com has discovered two additional assailants. One, a virus known as Phage, causes screen blackouts and infects other programs; it can also spread through e-mail or an infected Web site. The other, called Vapor, is a Trojan horse that hides all the icons for your third-party apps as if they'd been deleted. McAfee.com has posted disinfection instructions in its Virus Information Library at vil.nai. com/vil. Once you're there, click Newly Discovered Viruses and scroll down to the links for Phage and Vapor. Alternatively, to get right to the details about Phage, visit vil.nai.com/vil/dispvirus.asp?virus k=98836, and for information about Vapor, hop to vil.mcafee.com/dispvirus.asp?virus\_k=98837&.

reported that superfast machines-933 MHz or higher-running Windows ME and Windows 98 can lose data when shutting down. The company says it's not to blame, though to date, similar problems have not been discovered on non-Windows systems. The problem, according to Microsoft, lies in the computers' hardware. Machines running at these racehorse speeds may be too fast for some hard disk drives.

When you save a file, for example, the data goes first to the disk cache, which serves as a holding area. Slower systems give the cache enough time to get the information onto the disk even if you save a file and shut down immediately. But the ultrafast processors shut the machines down so quickly that sometimes all the data doesn't make it. In addition, Windows carries out some other functions at the system level that you don't have any control over, like updating directory entries. These kinds of tasks would also be affected by the problem.

Microsoft says it has sent software patches to computer manufacturers to help fix the problem for now. Contact your PC maker to see if a patch is available. In the meantime, make sure you save what you're doing, then wait a little bit before shutting down your fast machine. For more information about the scope of the problem, see "Data Loss Threatens Fast Windows Systems" at www.pcworld.com/news/shutdown.



You can find files from this article at www.pcworld. com/downloads. Stuart J. Johnston is a journalist and tech columnist based in Bellevue, Washington.

UGGED

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2505LS	Pentium® III 750MHz	20GB	128MB	Win ME	12.1" XGA TFT	CP16609	90/mo.	2999*
Z505LSK	Pentium* III 750MHz	20GB	128MB	Win 00	12.1" XGA TFT	CP16610	93/mo.	3099*



VIO.

#### ▲ VAIO® model 7505,JE shown

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F580K	Pentium® III 650MHz/SS*	12GB	64MB	DVD-ROM	Win 00	15" XGA TFT	CP15848	87/mo.	2799**
F590	Pentium® III 750MHz/SS*	18.1GB	128MB	DVD-ROM	Win 98	15" XGA TFT	CP15901	99/mo.	3399
F690K	Pentium® III 850MHz/SS1	30GB	128MB	DVD-ROM	Win 00	15" SXGA+ TFT	CP16602	119/mo.	4099



▲ VAIO\* model F590 shown

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XG28K	Pentium* III 650MHz/SS†	12GB	128MB	DVD-ROM	Win 00	13.3" XGA TFT	CP15851	87/mo.	2899*
XG39	Pentium® III 850MHz/SS†	30GB	128MB	DVD-ROM	Win ME	14.1" XGA TFT	CP16603	113/mo.	3699**

Price AFTER manufacturer's \$100 mail-in-rebate. Before rebate: \$2699 (CP16608); \$3099 (CP16609); \$3199 (CP16601); \$2199 (CP16601); \$3099 (CP16604). Product must be purchased between 10/1/2000 and 1/31/2001. Rebate coupon available at www.warehouse.com/rebate/sony or call 1-800-390-0706. Rebate must be postmarked by 2/28/2001.

"Price AFTER manufacturer's \$200 mail-in-rebate. Before rebate: \$2899 (CP15808); \$2999 (CP15848); \$3999 (CP16603). Product must be purchased between 10/1/2000 and 1/31/2001.

Rebate coupon available at www.warehouse.com/rebate/sony.or.call 1-800-390-0/706. Rebate must be postmarked by 2/28/2001.
† Price AFTER manufacturer's \$100 mail-in-rebate. Before rebate: \$2999 (CP15851). Product must be purchased between 6/17/2000 and 11/30/2000. Rebate coupon available at www.warehouse.com/rebate/sony.or.call 1-800-390-0/706. Rebate must be postmarked by 1/23/2000.

<sup>§</sup> Leases are available to business & education customers with approved credit on product orders where at least one product totals \$750 or more. Payments are based on a 48-month Lease. Other leasing terms available. Leasing terms subject to change without notice. Call us toll-free for complete details.



▲ VAIO® model YG28K show

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RX270DS	Pentium <sup>e</sup> III 866MHz	40GB	128MB	DVD/CD-RW	CP16483	50/mo.	1699
RX280DS	Pentium <sup>e</sup> III 1GHz	60GB	128MB	DVD/CD-RW	CP16482	67/mo.	2299

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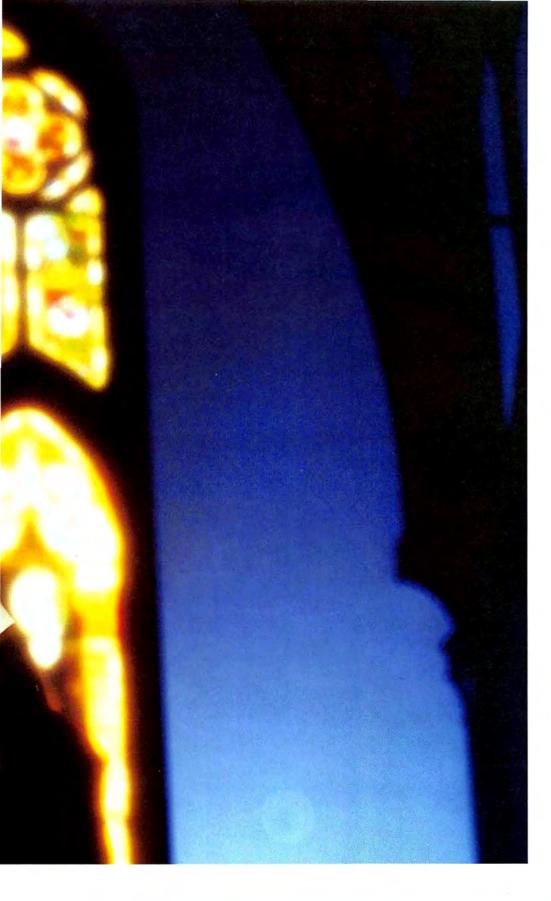
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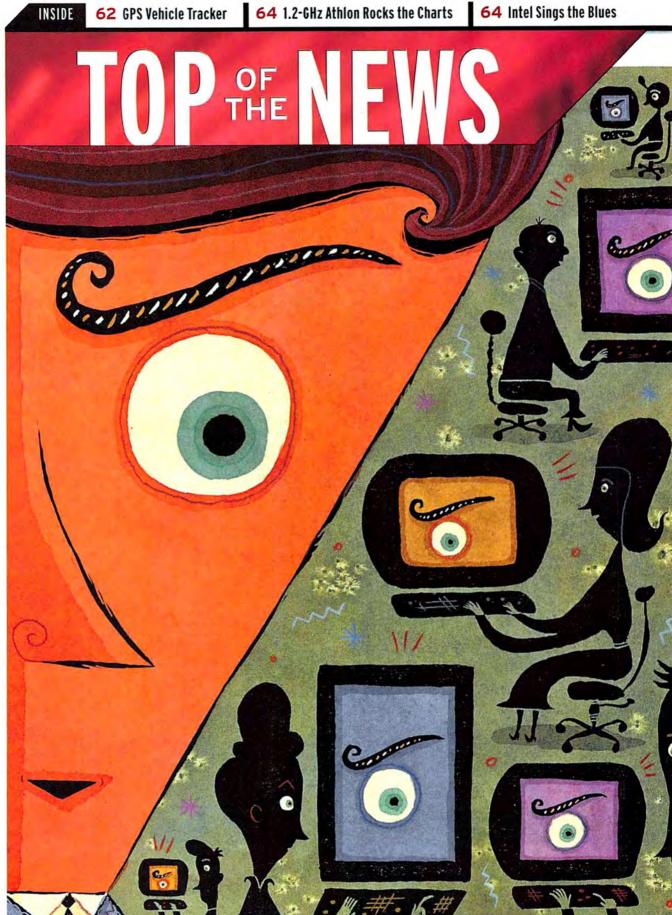




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# Is Your Watching home and small-business use:

New desktop snoopware products let anyone-boss, business partner, or spouse-track your PC habits.

IF YOU LIE awake at night fretting about personal privacy and your computer, consider this: The biggest threat may not be the government or the operator of the Web site you visited late last night, but your business partner, your boss, or even your spouse.

Products for monitoring desktop computers have been around for years. But until recently they were primarily designed for and marketed to large businesses that worried about employee misuse of Internet access and the company e-mail system. Now, a new wave of low-cost, easy-to-use monitoring products is available to home and small-business users. Dubbed snoopware, these products do everything their large-scale corporate cousins can-and in some cases, even more.

#### SPY ON THEM ALL

ADVERTISING for these products makes their intended use crystal clear: "Secretly Record Everything Your Spouse, Children, and Employees Do Online," invites one firm. Another vendor promises to help "companies understand how employees use their computers, especially, how much time they spend for non-business purposes or in ways that could result in legal exposure for the organization."

PC World tested four snoopware products intended for

Insight, a \$100 per seat product from Trisys; WinWhat-Where's Investigator (\$99 for a single-user license); and SpectorSoft's EBlaster (\$60 per package) and Spector 2.1 (\$70 per package). Our conclusion: Though each does its job a little differently, all are extremely effective at surreptitiously recording activity on a computer, whether it's in an office or in the family room.

We also discovered that it's possible, though not easy, to determine whether you're being monitored. But unless you know just what to look for, and where (see "To Catch a Spy," page 60), you may never know that someone else has been clandestinely observing your every keystroke.

Secret computer recording technology disturbs privacy advocates, who worry about possible abuse of spy software. For the moment, such software is virtually unregulated, and its use is spreading rapid-

ly, especially in the corporate world. Earlier this year, an American Management Association survey of



# **Product Pipeline**

➤ Colorful Visors: Handspring is selling two new Visor personal digital assistants, the \$299 Visor Platinum and the \$449 Visor Prism. Both devices feature a faster Dragonball VZ 33-MHz CPU and the latest Palm operating system, version 3.5. In addition, the Prism offers an impressive 16-bit color display, which makes some Springboard addons, such as a camera or a GPS module, even more enticing.

➤ Wearable Music: Pine Technology USA has announced a lightweight, wearable digital audio player, D'music Palmp-3. The 2.5-inch disk-shaped Palmp-3 plays MP3 files and has an FM radio, a voice recorder, and an electronic telephone directory that holds up to 100 contacts. The \$179 unit comes in a choice of four colors and has 32MB of memory (expandable to 64MB if you add a SmartMedia card).

# Tidbytes

➤ Social Security Online: Here's government paperwork reduction for the rest of us: As you read this, or shortly thereafter, the Social Security Administration expects to begin accepting applications for retirement benefits online. Other SSA online services include retirement-planning calculators and a monthly e-mail newsletter (www.ssa.gov).



GET UP-TO-THE-MINUTE news, including hot game demos, the latest reviews, and productivity

shareware, at PCWorld.com. Point your browser to www.pcworld.com/pcwtoday.

By Bill Wallace and Jamie Fenton

over 2100 member firmsmany of them among the biggest in the country-found that 74 percent monitored employees' communications, including Internet use, e-mail, computer files, and phone calls (see the chart on page

62). That's more than double the percentage found in a similar survey in 1997.

Exactly how often snoopware monitoring occurs in small businesses and homes is unclear. But the rapid emergence of products targeting this market suggests that vendors see financial opportunity in people's mistrust of their own families and employees.

## **ADULTERYWARE**

SPECTOR 2.1 from Spector-Soft (www.spectorsoft.com) is perhaps the best-known commercial snoopware aimed at home users. Company spokesperson Doug Fowler says that roughly 50 percent of the software's sales are made to people monitoring spouses, and at least 20 percent to people monitoring kids.

A memory-resident program, Spector 2.1 periodically captures screen shots of

> the desktop. Spector 2.1 can run in monitoring mode (with a small indicator visible on the screen) or in stealth mode (with no obvious indication to users that

the program is in place).

By typing a special key combination and an optional password, the owner of the program can invoke a VCR-like display of actions the computer's users have taken, as well as log info and keystroke data. An options screen lets the owner choose how often to take screen shots, what color depth to record the grabs in, whether keystrokes should be captured, and so forth.

The program works by recording information in a specified folder inside the Windows directory. The files have uninformative names such as 4FoBF6D8.TPS.

# REMOTE SNOOPING

TO SEE THE information a Spectorized computer has gathered, you must sit down at the machine-which could be awkward if the person you're keeping tabs on uses it all day long. To circumvent this problem, SpectorSoft has created EBlaster, a program that regularly sends e-mail reports of Spector 2.1's findings to a designated address. The reports include listings of each program executed, right down to the user keystrokes.

EBlaster can record anything transmitted from the host machine, even by popular chat software such as Instant Messenger and ICQ. It can also send screen shots.

The program works over networks and dial-up connections (even AOL) if the e-mail on the receiving end can handle attachments. Both Spector 2.1 and EBlaster require Windows 95 or later on computers that have 16MB of memory and 10MB of open disk space.

## ON-THE-JOB SPYING

WINWHATWHERE'S (WWW. winwhatwhere.com) Investigator software targets business users rather than the home market. Instead of taking snapshots of the user's desktop, it maintains detailed records of the times and dates when programs run and when keystrokes are entered on a computer. The program accumulates all of this data in an Access-compatible database, and it can either e-mail the information to the monitoring person or analyze it locally.

Registered owners can run the program in stealth mode. Under this arrangement, the software displays no toolbar tray icons or splash screens to hint that it is present and at work. Like most other snoopware, Investigator does not show up in Windows' Close Program list (which appears

# To Catch a Spy: How to Tell if You're Being Snooped

THE BEST COUNTERESPIONAGE tactic, obviously, is to refrain from conducting sensitive business-or pleasure-on equipment that other people can access. And never use company equipment for unauthorized activities. The courts have ruled, quite clearly, that employees do not have absolute privacy rights in their use of such equipment.

While not required to do so, honorable businesses will tell employ-

ees their policies on monitoring. But snoopware is available now to anyone willing to pay for it, including those with devious motives.

Although the snoopware available on the market today is specifically designed to go undetected by the PC's user, several methods can help you determine whether you are being surreptitiously monitored:

1 Check your computer's system folder for changes. All of the programs we evaluated make substantial alterations there.

One good way to monitor the situation is to regularly use a backup program that generates a report detailing files that have changed.

Any unexplained changes in the system folder-particularly changes that involve .dll and .exe files-are cause for suspicion.

- O Look for alterations in the Registry. These are harder to spot than system folder changes, but you can use a Registry-editing tool-such as Registry Tool, by the company of the same name-to track changes and compare the reports it produces over time.
- Watch out for odd file names that have the "hidden" property. checked. Snoopware programs typically use deceptive file names and activate the "hidden" file property feature. Good backup programs see through this. To inspect manually, enable the Show All Files option, under the View tab in the Folder Options dialog box; this is accessible under the View menu in the Windows desktop or in Windows Explorer. Look around the drive, especially in the system folder, for files with faded icons. Be careful: Important, legitimate system files are often hidden to prevent accidental and disastrous erasure.

One last headache for privacy sleuths: The snoopware that you're trying to detect may be recording your detection efforts.

For more details on countermeasures for products we evaluated, see pcworld.com/dec2000/snoopware. -Jamie Fenton

# Site to See: Orchestrate.com

MORE THAN JUST a messaging site, Orchestrate 2000 is a personal portal. You can get news, weather, contacts, calendar entries, and messages at one site, though you must use an Orchestrate e-mail address to do so for now. But only the My Orchestrate page, Message Center, Contact Manager, and telephone



Server or Windows 2000. Tri-

DISPATCH



SCREEN SHOT taken secretly by Spector 2.12 shows a user desktop.

when you press <Ctrl>-<Alt>-<Del>) or in the Add/Remove Programs window.

If you're more interested in the big picture of a PC's use than in minute, exhaustive details, Insight from Trisvs (www.trisys.com) might do the job. This program monitors employees' use of their computers but does not capture pictures of the monitor display or record the incoming and outgoing text. Insight has both desktop and server components. On the desktop, a

small monitoring-agent program observes user activity and periodically contacts the server to report on time spent by employees using various applications, including the number of mouse clicks and keystrokes entered.

Insight logs all Web pages the user visits-but only if Internet Explorer is the browser. It does not capture such precise details as the actual keys pressed or the contents of the Web pages. The server application can generate activity

tistics, another reason that Insight is more of a corporate or small-business application than a home product. **GOOD OR EVIL?** 

IN THE CORPORATE WORLD, snoopware has helped uncover crimes such as embezzlement and fraud, but the potential for abuse worries many civil liberties advocates, who view the new technology as eroding personal privacy.

reports for individual worksta-

tions or for an entire work-

group. Basic reports show

how much time employees

have devoted to different appli-

cations; if Internet Explorer

browsing is involved, you also

get information on the Web

pages that employees visited

and the length of their visits.

Insight's server component

runs on Windows NT 4.0

sys recommends

using SQL Server to

accumulate the sta-

"The changing structure and nature of the workplace has led to more invasive and

call services are free. You must pay \$10 to \$20 per month for features such as Conferencing, Calendar, e-mail, and Web content by phone, and for a onenumber follow-me feature.

# Top PC World Downloads

#### MotherBoard Monitor

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Displays temperature and fan data and alerts you to trouble.

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Improves system performance by removing unused DLL files.

#### O DLL Show

143KB, 3694 downloads

Displays a list of all running programs and comprehensive information about memory load.

#### Memory Cleaner

40KB, 3560 downloads

Releases memory tied up by closed applications.

#### Backup Maker

2.23MB, 3374 downloads

Sets automatic backups as frequently as you want and indicates how many copies to keep.

Find files on www.pcworld.com/ downloads/top5/dec2000.

# Snoopware Bills in Congress

CONGRESS IS ADDRESSING the issue of computer surveillance in several bills, but none would make monitoring itself illegal. Here are the details:

H.R. 4908-Notice of Electronic Monitoring Act. Sponsor: Rep. Charles Canady (R-Florida). Would require companies to notify employees that their computers are being monitored. Pending version does not envision penalties for violators. Introduced July 6, 2000. Currently before the House Judiciary Committee.

H.R. 4987-Digital Privacy Act of 2000. Sponsor: Rep. Bob Barr (D-Georgia). Would add e-mail messages and stored computer communications to communications now covered by federal wiretap laws. Would exclude them as evidence in criminal cases if intercepted without probable cause that they related to a criminal act. Would establish a reporting requirement when e-mail evidence is sought in criminal cases, and would set time limits on nondisclosure of intercepts. Introduced July 27, 2000. Referred to House Judiciary Subcommittee on the Constitution.

H.R. 5018-Electronic Communications Privacy Act of 2000. Sponsors: Reps. Charles Canady (R-Florida) and Asa Hutchinson (R-Arkansas). Would extend existing federal statutes on interception of electronic communications to cover e-mail messages, requiring law enforcement monitoring to adhere to standards currently applicable to pen registers and telephone wiretaps. Would exclude e-mail evidence collected without probable cause. Introduced July 7, 2000. Sent to House floor.

# Workplace Monitoring Is on the Rise

CONCERNS OVER employee misuse of desktop PCs have greatly expanded the use of business monitoring.

EMPLOYERS' MONITORING ACTIVITY	1997 '	1998 '	1999 '	2000
Any type of monitoring activity	35%	43%	45%	74%
Record and review telephone conversations	10%	11%	11%	12%
Store and review voice-mail messages	5%	5%	6%	7%
Store and review computer files	14%	20%	21%	31%
Store and review e-mail messages	15%	20%	27%	38%
Monitor Internet connections	not asked	not asked	not asked	54%
Video-record job performance	16%	16%	16%	15%

<sup>&#</sup>x27;Results reported in March of each year. Numbers reflect percentage of companies reporting activity.

SOURCE: AMERICAN MANAGEMENT ASSOCIATION ANNUAL SURVEY ON WORKPLACE MONITORING AND SURVEILLANCE

often covert monitoring practices that call into question employees' most basic rights to privacy and dignity," Electronic Privacy Information Center executive director Marc Rotenberg said last summer in support of congressional efforts to curb such practices.

Virtually no laws currently restrict employer monitoring of PCs in the workplace, much less home use of snoopware.

Pending legislation to tighten these rules (see "Snoopware Bills in Congress," page 61) focuses on requiring notification of employees if their computer activity is being monitored, a disclosure not required today. Several federal bills also mandate court warrants for e-mail interception in criminal cases but are silent on the use of such tactics to monitor how employees work with PCs. The National Labor Relations Board recently ruled against employers who fired workers over e-mail messages that promoted union organizing and criticized workplace conditions-but even those rulings didn't attempt to restrict the monitoring itself.

In the past two years, Dow

Chemical, Xerox, and other large employers have fired dozens of employees for surfing the Internet on company time or for sending and receiving improper e-mail. In most cases, the conduct was detected via snoopware. With the low-end products now available, small businesses-not to mention your own familycould emulate the practices of Fortune 500 companies.

So if you work in a small business or use your home PC for activities you'd prefer to keep private, you might investigate whether you're being monitored (see "To Catch a Spy," page 60). You may not be able to stop the snooping, but at least you'll know whether you're under surveillance and can respond accordingly.

The moral: Big Brother may be nearer-and more familiar-than you think.

# I Put a Tail on You: Snooping by Satellite

EVER WONDERED where your lowestproducing salesman spends his time? Do you harbor dark suspicions about your spouse's unexplained absences? Computer-monitoring software can snoop on people sitting at desks, but what if your target is mobile? You could play Dick

Tracy and try to follow your suspect yourself. Or you could do what the government does: Use a satellite-or more precisely, 24 satellites,

the array that makes up the Global Positioning System (GPS). Developed primarily for the U.S. military but now widely used for civilian activities such as aviation and trucking, the GPS provides highly accurate worldwide positioning and navigation information 24 hours a day. Security companies have found GPS trackers to be very useful, too-for example, to monitor couriers or track endangered corporate executives.

Now, the GPS is being used with products for nosy consumers: private eyes, spouses, parents, employers, or anybody else who wants to tail someone. TravelEyes from Advanced Tracking Technologies (www.traveleyes. com) is one such virtual PI. Advertised as concealable, this \$600 system includes a GPS receiver that's smaller than a pack of cigarettes, a magnetic mount antenna with a cable that plugs into the unit, and a cigarette-lighter power adapter. To connect the device, you can use an optional \$12 cable for direct wiring to a fuse box or vehicle battery. The antenna can be hidden under the dashboard or seat.

The unit can record up to 20 hours of travel per use. You transfer data from the unit to a PC via serial cable. Your monitor displays a

> map that shows where the vehicle went, including street addresses for stops made, the time spent at a stop,

and the total mileage involved.

In our tests of a shipping unit, the TravelEyes system performed perfectly. The customized maps that it produces are simple enough for anyone to figure

out. Though it doesn't rank as high on the coolness scale as those tiny hidden tracker gadgets in James Bond flicks, TravelEyes works impressively well.

-Bill Wallace and Jamie Fenton

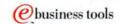


TRAVELEYES uses a GPS device to track a vehicle's route.



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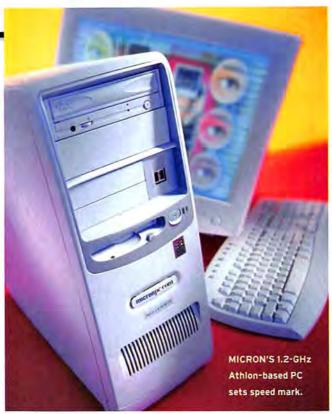
# AMD's 1.2-GHz Athlon Packs Power at a Friendly Price

FIRST LOOK

AMD IS ON A ROLL. Hot on the heels of its speedy 1.1-GHz Athlon chip comes yet another CPU star, the 1.2-GHz Athlon. And what's new goes beyond just the chip: In our tests of the first 1.2-GHz system from Micron, the pairing of a 1.2-GHz Athlon processor with Double Data Rate SDRAM memory proves to be a match made in speedster heaven. It's a great deal, too.

While Intel has been set back by the recall of the 1.13-GHz Pentium III and a delay in the Pentium 4 launch (see "Intel's Sorry Season"), AMD has forged ahead with everfaster versions of its Athlon chip and a new motherboard chip set that supports DDR SDRAM. Based on SDRAM technology, DDR's evolutionary memory keeps pace with the 1.2-MHz Athlon's new 266-MHz front-side bus (previous Athlons used a 200-MHz bus, while the Pentium III bus maxed out at 133 MHz). DDR competes with Rambus (RDRAM), the nextgeneration memory that Intel has backed for the past year and that forthcoming Pentium 4 systems will use.

Micronpc.com is one of the first vendors to offer a system based on the DDR-Athlon combination. The \$3025 preproduction PC we tested came with a robust configuration: 256MB of DDR SDRAM, a 30GB hard disk, a 19-inch monitor, Windows Me, an NVidia GeForce2 GTS graphics card with 64MB of DDR SDRAM, and Ricoh's new combination 8X DVD-ROM and 12X/10X/32X CD-RW drive with JustLink technology (which Ricoh says cuts down on write errors). Expect similar Athlon-DDR systems from vendors such as IBM and



Polywell in the near future. Meanwhile, 1.2-GHz Athlon systems with PC133 SDRAM should be available from vendors like Gateway and HP in November, but were unavailable in time for testing.

#### SPEED BLOWOUT

JUDGING FROM the results of our tests, these systems are a heck of a value: The Micron Millennia XP outperformed 1-GHz PIII PCs with SDRAM. yet costs about the same.

The Millennia XP blew away every other desktop system running Windows Me that we've seen, earning a score of 180 on our PC WorldBench 2000 tests. You may be able to save a few bucks and still get that level of performance in a system with a 1.1-GHz

# Intel's Sorry Season: Glitches Plague CPU Giant

HOPING TO FIND a Pentium 4 for the holidays? It will be close, but the first PCs based on Intel's latest CPU should ship just in time. Because of a minor glitch in the 850 chip set accompanying the P4, the launch,

originally anticipated for late October, is now expected in late November. Intel officials have downplayed the delay, saying only that the company always planned a launch sometime in the fourth quarter.

Retailers will have to hustle to obtain systems in time for the gift-giving season, but companies such as Dell, Gateway, Hewlett-Packard, and IBM are confident they'll be able to ship the machines by then. Most mainstream PC buyers, however, are likely to shy away from expensive new P4 systems in favor of less-pricey PCs equipped with Pentium III or Athlon processors, says analyst Nathan Brookwood of the

research company Insight 64.

# Chips Awry

THE P4 DELAY fuels a growing impression that Intel is off its game, says Rob Enderle, vice president of Giga Information Group. Putting the launch on

hold for a month closely followed the company's September decision to cancel Timna, a CPU that was to include integrated graphics and memory controllers, and in which Intel had invested years of research and development (Intel cited market changes for the drop). In August, Intel stopped production of its limited-release 1.13-GHz PIII-on the same day that AMD launched its 1.1-GHz Athlon. And in May, Intel's problem-plagued 820 chip set returned to the news because of trouble with the Memory Translator Hub (used in close to a million motherboards to connect the chip set to SDRAM instead of RDRAM). Intel recalled the MTH-equipped 820 motherboards and offered to replace them with RDRAM-equipped equivalents.

The launch of the P4 could bolster Intel's image. But if a high-speed PC is on your holiday wish list and the P4 slips anew, consider a fast Athlon-based system instead. -Tom Mainelli







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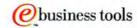
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### BUSINESS AND GRAPHICS APPS

TEST REPORT

# Red-Hot 1.2-GHz Athlon Sizzles Through CPU-Hungry Apps

SYSTEM	Processor	(all 256MB)	PC WorldBench 2000 score
Micron Millennia Max XP	Athlon-1200	DDR SDRAM	180
Average of two systems	Pentium III-1000	SDRAM	163
One system¹	Athlon-1100	SDRAM	180
One system	Athlon-1000	SDRAM	167
			Faster

I	Unreal Tournament (frames per second)
	83
Ì	68
Ì	68
	2
ı	Faster

Photoshop 5.5 (seconds)	AutoCAD (seconds)	MusicMatch (seconds)
115	448	66
143	607	105
126	491	72
2	2	2
Faster		

HOW WE TEST All systems are tested with PC WorldBench 2000, PC World's application-based benchmark. In the AutoCAD 2000 test, we time the Autodesk User Group International's AUGI Gauge benchmark, which runs computer-aided drafting tasks. In the Unreal Tournament test, we run the included demo and report its results. For the Photoshop 5.5 test, we time CENTED the running of a macro that applies a series of filters to a 1.6MB image file. During the MusicMatch encoding test, we time the conversion of a raw 14.3MB .wav file into an .mp3 file using MusicMatch Jukebox. Number highlighted in red represents best score. 1 Reference system. 2 We did not perform this test on the unit.

Athlon chip: For comparison, we upgraded a shipping 1.1-GHz Athlon computer, boosting its memory to 256MB of SDRAM, and it too scored 180 on our test suite. These results are nearly 8 percent higher than the score achieved by a 1-GHz Athlon PC we tested previously and about 10 percent above the averaged scores of two 1-GHz PIII systems (all tested with 256MB of SDRAM and Windows Me). The majority of users should notice this performance difference.

The 1.2-GHz Athlon system took over as the undisputed champ in additional tests with CPU-intensive applications. Improvements in these tests ranged from a 24 percent performance boost over the 1-GHz PIII systems for Photoshop 5.5 to an impressive 59 percent jump for the Music-Match encoding test. The 1.2-GHz unit also outpaced our souped-up 1.1-GHz Athlon system on these tests, but by a relatively modest 9 percent.

## TIME TO BUY?

IF YOU'RE doing complex calculations, multimedia creation, and the like, you'll definitely notice the performance gains that a 1.2-GHz Athlon system delivers. For example, users who rip CDs into MP3 files might benefit from the speed; gamers might too. For

most daily tasks, however, the improvements are less significant, and you may be better off buying a system one or two notches below the top and saving some money. But power users should take a close look at these new Athlon systems.

-Anush Yegyazarian

#### Micron Millennia Max XP

Street price: \$3025: 888/719-5031, www.micronpc.com

# More Than Just a Pretty Interface: AOL Moves Up to Version 6

AMERICA Online has always appealed more to Internet novices than to more-experi-

enced users. The e-mail client in particular has been years behind the times-and the competition. That's finally changing: AOL 6, the service's new front end, offers a solid email client, with multiple sorting options and industry-standard formatting-features that users of Outlook Express and Eudora have long taken for granted.

The new version delivers other improvements as well. The calendar and ad- INTERFACE-LIFT: AOL dress book now work 6's toolbar replaces online and off, and you buttons with icons and can play MP3s and drop-down menus. watch videos without

File Edit Print Window Sign Off Help

America Unline

Read Write

installing additional software.

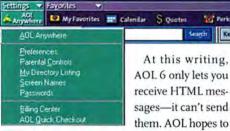
I looked at a beta of AOL 6; the final version should be available on CDs in junk mail and cereal boxes by the time you read this.

The best thing about AOL 6 is the vastly improved e-mail

Negt Chat i Shop (II) Internet

Type Keywords or Web Addresses here

client, Previously, AOL users could share HTML-formatted messages only with fellow subscribers. With AOL 6, you can share them with anyone using Eudora, Outlook, or just about any other up-to-date email client.



fix this before 6 ships (the problem lies with the company's server, not with the desktop software I tested).

Seagth Key

Another improvement: The software now permits you to sort messages by date, e-mail address, or subject, so you



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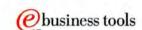
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can easily find all the messages on a particular thread or from Aunt Bertha. The address book now resembles a complete contact manager, allowing you to store addresses, phone numbers, birthdays, and other information. It's not the world's greatest personal information manager-you can't, for instance, add custom fields-but it's considerably more capable than the old name-and-e-mail-address list of earlier versions.

# HERE, THERE, AND **EVERYWHERE**

THE NEW address book is more portable than the one in earlier incarnations: Version 6 stores it both on your computer and on AOL's server, where you can access it from any sys-

**AOL Media Player plays** standard audio and video formats without extra installations.

tem that has AOL 6 software. Similarly, AOL's Web-based calendar-which previously stored your appointments only on AOL's server-now keeps a copy of them on your hard drive as well, so you can find out what's on your schedule without having to venture online. Unfortunately, your address book isn't available on the Web site. And you can't get your bookmarks when you are away from your desktop, something remote copies of Microsoft's MSN let you do.

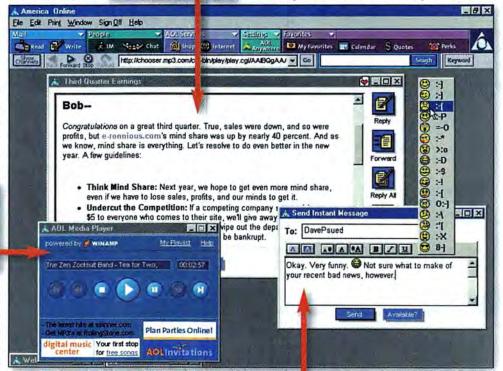
What if you don't have access to a PC? AOL Anywhere lets you check e-mail and other information with a modemequipped palmtop or Webenabled cell phone. AOL 6 introduces an AOL Anywhere icon. The icon takes you to a

Web page where you can specify what information you want to come up when you access AOL via your Web-enabled cell phone. Soon, AOL by Phone will allow you to check

your e-mail and get stock quotes and weather reports from any telephone.

Want multimedia? AOL 6 tant rates the site and lists competing online stores. Since the Shopping Assistant works only with stores that partner with AOL, however, its range is limited. For the stores

I visited, the rat-Finally! AOL supports ings-by marketing research HTML e-mail, so you can share formatted company Elrick & Lavidge-all messages with nonhad four- or five-AOL members. star ratings out words that you've used before. You can change the order of entries quickly in your Buddy List. Both Chat and Instant Messaging will convert keyboard-character emoticons into graphics on the fly, so you can type :-) and get a bright yellow smiley face. And the toolbar is clearly divided into five sections, each with one or more icons and a pull-down menu. You still get those irri-



WHAT'S NEW: AOL 6 offers multimedia, better e-mail, and prettier instant messages.

comes with the AOL Media Player, which plays MP3, Real, WAV, and other formats. If you access AOL through a broadband connection, you automatically get AOL Plusa collection of specially prepared AOL content with integrated multimedia (no need to launch the player separately).

The AOL Shopping Assistant is a bar that pops up when you visit the site of an AOL merchant partner. The Assis-

**AOL Instant Messaging and** Chat now convert typed emoticons into graphics-and let you pick the image if you don't remember what to type.

of a five-star maximum. An AOL spokesperson explains, "We choose our merchant partners very carefully."

#### THE LIVING IS EASY

MINOR CHANGES to the interface make AOL a bit simpler to use. An autocomplete feature finishes entries of Internet addresses or keytating ads whenever you log on, though.

With MSN Explorer competing for the business of Net novices (see November's New Products, www.pcworld.com/ nov2000/msn\_explorer), AOL can't afford to rest on its laurels-and wisely, it's not. If you're using AOL, upgrade to version 6 as soon as a CD-ROM floats your way-if only for the improved e-mail client. Whether you conduct business via e-mail or surf the Web for fun, AOL 6 is a major step forward.

—Lincoln Spector >





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intel inside inside

# Transmeta's Chip Comes In: Notebook Runs Longer but Slower

#### REALITY CHECK

WHAT BUSINESS traveler wouldn't want a laptop with double the normal battery life?

Naturally, many mobile-PC users took note when Transmeta promised a batteryfriendly notebook processor that would dramatically increase the run time between recharges while offering Intelcomparable performance. It took a while, but the first device to use this chip, Sony's VAIO PictureBook PCG-C1VN, is finally here. Some of Transmeta's battery-life claims stand up-but be ready to pay a hefty performance penalty.

Unlike Intel's and AMD's chips, which are x86 CPUs that do all their work in hardware, Transmeta's Crusoe uses code-morphing software to change x86 instructions into language it understands. Shifting the instruction work to software affects performance but lets Transmeta build a smaller chip that uses less power and generates less heat. Combine that economy with Transmeta's LongRun technology-which shifts the chip into low or high speed and voltage depending on app needs-and you have a more power-efficient CPU.

The \$2299 Sony Picture-Book we tested came with a 600-MHz Crusoe TM5600 CPU, 128MB of SDRAM, and Windows Me. It also had a 12GB hard disk, an 8.9-inch TFT display with 8MB of graphics RAM, a built-in 56kbps modem, a built-in camera, and both Memory Stick and PC Card slots. Fujitsu, Hitachi, IBM, and NEC have

also announced plans to ship notebooks with Transmeta's chip, but none have given a date for a U.S. launch.

## PICTURE PERFECT?

IN OUR battery tests of the preproduction PictureBook, the unit lasted 2 hours and 32 minutes-50 minutes longer than one of Sony's most recent PictureBooks, the PCG-

C1XS, which we tested for comparison. The comparison unit had a similar configuration,



save for a Pentium II-400 CPU, 64MB of RAM, and 2.5MB of graphics RAM. For a closer comparison, we upgraded the PCG-C1XS from Windows 98 SE to Windows Me.

Most serious mobile users wouldn't sneeze at the extra 50 minutes. And overall, 2.5 hours is a good battery life span for this class of product.

But at what cost? The mininotebooks traditionally score poorly on performance tests, so we didn't expect the new PictureBook to break any PC WorldBench 2000 records but its score of 66 was shockingly low. Even with half the RAM of its sibling, the older

## Sony VAIO PictureBook PCG-CIVN

Street price: \$2299; 800/476-6972; www.sony.com

Mini-notebook users don't typically demand the highest performance levels, so some may not care about the loss. During hands-on testing, the Crusoe-based unit easily handled the basics such as word

> processing. It did slow noticeably during some video-editing tasks, however.

#### WAIT AND SEE

FOR SOME, improved battery life will offset the performance loss. And future products based on Transmeta chips may lessen the performance hit and be that much more appealing.

As for the sharp-looking PictureBook, it offers a lot to users who need a very mobile package-it weighs just over 2 pounds and comes with both video- and photo-editing apps. If top performance isn't an issue, it may suit your needs.

-Tom Mainelli

lose a noticeable 19 percent in performance (maybe more, since the older unit would likely perform better with equivalent RAM).

SYSTEM PERFORMANCE

TEST REPORT

# Take Your Pick: Long Life or Speed

Pentium II-based Picture-

Book scored an 81-so you

SYSTEM	Processor	Memory (SDRAM)	PC WorldBench Faster 2000 score	Battery life (hours: minutes)
Sony VAIO PictureBook PCG-C1V	Crusoe TM5600-600	128MB	66	2:32
Sony VAIO PictureBook PCG-C1XS	Pentium II-400	64MB	81	1:42

HOW WE TEST All systems are tested with PC WorldBench 2000, PC World's application-based benchmark. A higher score is better. For more details on PC WorldBench and how we run it, see www.pcworld.com/benchmark. To test battery life, we drain and fully recharge the battery twice and set power-saving options to match a consistent profile where possible. Office workers use Windows 9x applications, periodically saving and allowing regular idle times. Notebooks are rotated among workers. We report the time elapsed when the notebook shuts itself off. Data based on testing conducted by the PC World Test Center. All rights reserved.







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# The Joy of X: Mac's Hot New OS Boasts Brains and Style to Spare



DON'T CALL Apple's new operating system Mac OS "Ex." Apple wants you to call it

Mac OS "ten," possibly to prevent the word sex from rolling

off your tongue as you say it. That effort is not likely to succeed: The Mac platform's beautiful new interface is as sexy as they comeand it has a brand-new high-performance engine to match.

In the past, Windows has often borrowed from the Mac OS. This time, Apple takes some cues from both Windows and Unix. For example, it includes a new dock reminiscent of the Windows taskbar (but

better looking). On the minus side, the new operating system discards some favorite features from previous versions. We examined the public beta of the OS, which Apple plans to ship by early next year.

#### MAC MEETS UNIX

THANKS TO the Unix platform on which it's based. OS X promises a faster, more stable Mac. Preemptive multitasking lets you run several operations at once, such as beginning an intensive database query and then switching over to your e-mail application. Symmetric multiprocessing makes more-productive use of multiple processors, and protected memory allows the system to keep running even if one app crashes. Various versions of Windows offer some or all of these attributes.

To take advantage of these new features, however, developers must update their applimultiple tasks simultaneously, such as starting up a couple of applications, copying files, and closing windows. But most older peripherals needed new drivers to work at all.



I'M LOOKING THROUGH YOU: Mac OS X's new Agua interface makes menus and the new taskbar-like dock (bottom) semitransparent.

cations-and unfortunately. the list of X-compatible apps is painfully short. But most of Apple's core developers (including Adobe, Macromedia, and even Microsoft) have committed to updates.

In the meantime, Apple says, the majority of existing applications do run on OS X but can't use its new features. Our tests confirmed this. When we installed Mac OS X on a Power Mac G4 Cube with one 450-MHz G4 processor and 128MB of RAM, individual applications crashed periodically, but never the entire system. And though our beta ran slowly, we could perform

In the stunning new "Aqua" interface, dialog boxes and drop-down menus are semitransparent-where they overlap solid objects, you can see through them faintly (a feature we'd love in Windows).

#### A PERFECT X

IN WINDOW title bars, three little gumdrop buttons in the upper left corner glow red, yellow, and green, respectively, when you pass your cursor over them. They close, minimize, and maximize your window, just as the corresponding buttons in Windows do (the old operating system let you roll windows up under their title bars, not minimize them).

The dock at the bottom of the screen functions similarly to Windows' taskbar, but it can also house favorite applications. As you run your cursor over the icons in the dock, they grow beneath it. Click on an icon in the dock, and it bounces gently up and down a couple of times until the app is up and running. Luckily,

> you can adjust the level of icon magnification to the size you like, shrink the size of the bar, or autohide it if you find all the movement distracting.

Other departures may faze some users. The old Mac OS used a vertical hierarchy in file windows (similar to the left pane of Windows Explorer); OS X adopts a horizontal hierarchy. Old-timers may miss the familiar Apple menu, which included useful features

such as menus for recently used applications, servers, and documents. File names are harder to read than they were in the old Mac OS.

But if gaining an operating system that performs better and doesn't crash means sacrificing some old comforts, many Mac users are likely to jump quickly from the dinghy to the speedboat, Mac OS X could even attract some Windows users looking for a chic alternative, as long as they're comfortable with a shorter list of available applications. If Apple doesn't convince the developers to join up, we can only hope that Microsoft's designers take note of OS X's style innovations.

-Alan Stafford ■





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#### IMPROVE YOUR NET VISION

# ONLINE LEARNING

# IN OFFLINE HOURS

t the end of the day, many computer professionals are eager to break away from cathode rays and keyboards, bug fixes and FTP uploads. But some, like Sean McCabe, a technical administrator for a

Massachusetts-based book publisher, can't seem to get enough of computing and Internet surfing. That's because McCabe is something of a 21st century Renaissance man who produces short films, music and multimedia projects that focus on the nexus where art, science and psychology meet.

While the Net has become a major source for legitimate—albeit offbeat—information, new digital toys and broadband connections are making it

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simply irresistible to people seeking a creative outlet, self-improvement, or just a good time. When used wisely, the Internet can provide unique services, skills, and resources to challenge the minds of users young and old.

challenge the minds of users young and old.

McCabe says the Net, which he has used for research since 1992, brings him into contact with physicists and philosophers at the front lines—and often at the fringes—of current metaphysical and scientific understanding. "I tend to gravitate towards the mystical, even the paranormal," he says. "Only on the Net will you find this kind of direct interaction between artists and scientists." McCabe regularly corresponds with scien-

tists and paranormal researchers via e-mail and

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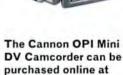
through live, one-on-one chats.

For artists as well as for scientists, the Net is an equal-opportunity medium. "Now anyone can publish their own work to some degree," McCabe says, "and most search engines don't discriminate [against them]." Once they have met his own critical standards, McCabe plans to submit some of his short films and animated works to online venues such as NewEnglandFilm.com, Undergroundfilm.com, DFILM.com and IFILM.com. Many of these sites provide free file conversion,

encoding and streaming services to filmmakers and video artists. McCabe thinks these sites are becoming a great place to get noticed. "Half of the studios in Hollywood have people surfing the Net full-time, trying to find up-and-coming talent," he says.

McCabe is also looking for a good place to exhibit his still images. One site, PhotoAlley.com, provides a free forum for photographers to share their work with family, friends and fellow artists. PhotoAlley also sponsors photo contests in which contest winners collect cash and other prizes. And friends and family can log on to PhotoAlley at any time to browse pictures from weddings, reunions or other events.

Professionally inclined Photo Alley members can learn about photography and solicit peer reviews of their work through the site's live Forums and PhotoFeedback community. In the Photo Alley Forums archives, photographers will find interviews with photojournalist Mary Ellen Mark, outdoor photographer Rob Sheppard, and other experts.



PhotoAlley.com.

## DEVELOPING SKILLS AND PICTURES

McCabe still takes most of his pictures with 35mm and other large-format cameras. He then scans the results on a professional-grade flatbed scanner. He's also in the market for new film and digital cameras. "I think it's important to remain open to different kinds of technology," he says. Photo Alley partners with leading photography magazine publishers to keep their users abreast of the latest photographic tools and techniques. Visitors to Photo Alley can read articles from photography's leading how-to magazine, *Petersen's PHOTOgraphic*, which boosts the skill levels of both amateur and professional photographers by

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Real pros can learn even more at Photo Alley by reading free articles from *Photo District News*, which focuses on copyright and legal news, new products and trends, and the latest work by hot photographers. Casual shutterbugs can visit Photo Alley's Digital Resource Center to learn about attaching photos to e-mail and incorporating them into Web sites and online albums. The Photo Alley site not only teaches the craft of photography, it also sells the leading cameras and accessories to make the process easier.

But even without the added efficiencies that the Internet provides for his photographic and other artistic pursuits, McCabe still wouldn't mind spending up to 20 hours a week online. "It has dramatically changed the way I work on all kinds of levels," he says. "For me, there have been very few downsides to the experience."

#### **TOO MUCH OF A GOOD THING?**

The Net offers most adults limitless opportunities for growth and recreation. But some people are getting hooked on the experience. To find out whether they are Net addicts, "people need to look at the impact their computer time is having on the important things in their lives," says Kathryn Wright, Ph.D., a psychologist and co-founder of WomenGamers.com, which produces content for the fast-growing women's gaming market. Wright's

clients must exhibit extreme behavior before she will consider a diagnosis of Net addiction. "Everybody's needs are different, after all," she says. "If someone is young and single, for example, I might be less worried about their late hours and the extent or complexity of their game-playing."

Online role-paying games (RPG) can be as healthy an escape as movies and novels, Wright says. And, because RPG are interactive by nature, they can be more beneficial than watching television. "But if someone becomes so enamored of their online characters that they substitute them for normal, everyday social interactions, or if they are skipping meals and showing up late for work, then they could be headed for serious trouble," she says.

RPG enthusiasts, meanwhile, are striving to see the brighter side of their sometimes murky virtual world. Brittany Cloud, a college student in Dallas, manages to shoehorn 20 hours per week of role-playing between her full-time work schedule and caring for her new baby. "It sure helps with my English classes," she says. "Creating characters in RPG definitely develops your writing skills. In fact, many [RPG] players are aspiring writers, and you can learn a lot from them."

#### WHAT ABOUT THE KIDS?

Adults are safely and successfully using the Net to connect with other adults. But are children benefiting from their participation in online communities? They are, says Rick Berg, Ph.D., a Web content developer at the Children's Discovery Museum of San Jose. In an article posted at Family Wonder.com, a family entertainment Web site, Berg writes, "Issues of violent content and other potentially objectionable material aside, games are intended to entertain. But children learn from games—all games. Even video games."

Berg says that role-playing games especially "provide opportunities for reading," and cites the story of a six-year-old nonreader who came to appreciate the value of language through role playing. As for older kids, Berg acknowledges that "the image of the loner in front of a video-game screen is a popular one," but he sees many social benefits. "[Older kids can] develop complex strategies, seek out mentor-friends, and talk with others about games," he writes.

Brittany Cloud will no doubt pass her love for online activities to her child. But Berg encourages all grownups to take a closer look at the Net's power to teach. "Ask [your child] questions while she plays," he writes. "What secrets has she unlocked? What skills did she need to find that hidden door? You'll be surprised by what she's learned."



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Intel 820 chipset with AGP4X
256KB L2 cache
128MB/712MHz ECC RDRAM
20GB Ultra ATA/66 hard drive³
nVIDIA TNT2 Pro graphics
7 slots, 5 bays
S710 17" monitor (15.7" viewable)
48X Max CD-ROM drive³
1.44MB floppy disk drive
Intel Pro 100+ NIC (PCI) with WoL and AoL
Microsoft Windows NT® Workstation 4.0
Compaq Premier-Sound™ audio
3-year limited warranty⁴

#### Configure-to-order options:

128MB 712MHz RDRAM: \$440 9x5, 4-hour, on-site warranty: \$99

#### **MULTI-TASKER**

#### ARMADA NOTEBOOK E500S

\$2099

#### Lease for \$60/month

#### > QuickAccess Code: 431X31-12943

Mobile Intel Pentium III processor 600MHz featuring Intel SpeedStep™ technology 13.3" TFT panel 8MB video memory 5GB SMART hard drive¹ 64MB SDRAM 24X Max CD-R0M drive³ Mini PCI 56K V.90 modem³ Weighs just 5.9 pounds Microsoft Windows 98 2nd Edition Microsoft Office 2000 Small Business® 3-year worldwide limited warranty\*

#### Configure-to-order options:

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#### Compaq recommends Microsoft® Windows® 2000 Professional for business.

Prices shown are Compaq prices; reseller and retailer prices may vary. Prices shown are subject to change and do not include applicable state and local sales tax or shipping to recipient's destination. "Some restrictions apply. See your local retailer or company com/smb/windows2000 for details. 'Compag Financial Services. Financing available through Compaq Financial Services Corporation (CFSC) to qualified commercial customers in the U.S. Financing is subject to credit approval and execution of CFSC documentation. Monthly payments are based on a 48-month Fair Market Value lease, and do not include taxes, or shipping charges. Other fees and restrictions may apply and CFSC reserves the right to change or cancel this program at any time without notice. For hard drives, GB=billion bytes. '24X Max CD-ROM data transfer rates may vary from 150 to 3600 KB/s, 40X Max rates vary from 150 to 6000 KB/s, and 48X Max rates vary from 3000 to 7200 KB/s. Some restrictions and excitations apply. Call (800) OK COMPAQ for



#### **BUSINESS BUILDER**

#### **PROLIANT ML330 SERVER**

## \$1649

#### Lease for \$47/month

#### > QuickAccess Code: 431X31-17X59

Intel Pentium III processor 733MHz 64MB 133MHz ECC SDRAM (exp. to 2GB)2 9.1GB Ultra2 hard drive (exp. to 218.4GB) Integrated Single Channel Wide-Ultra2 SCSI controller

5 Bays: 3 removable, 2 hard drive 40X Max CD-ROM drive3 10/100 TX UTP NIC (WOL) 6 Slots: 2 64-bit PCI, 4 32-bit PCI Server setup and management software 3-year limited warranty

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#### **PROLIANT ML350 SERVER**

\$2123

#### Lease for \$60/month

> QuickAccess Code: 431X31-16559

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Protect your equipment and data from damage due to power surges, spikes, and outages.



# prints at an affordable price.







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# 800-MHz Budget PCs: A Look **Beyond Processor Power**



HOME PCS

GOOD PROCESSOR speed and an attractive price don't always add up to a great PC deal. You can find home systems with Pentium III or Athlon CPUs running at 800 MHz or greater priced at less than \$1200. Invariably, however, you take a hit in the quality or quantity of other system components.

After looking at two shipping models of these sub-\$1200 systems, the Gateway Essential 866 and the Polywell Poly 830KX, I found that I'd get more for my money by focusing less on the PC's processor and more on its monitor, graphics card, sound system, and memory.

Gateway's Essential 866 lives up to its name by packing only the most critical components into a handsome whiteand-gray, 12.7-by-11.8-by-4.16inch case. The system sets up either vertically or horizontally and could be an ideal fit for a cramped home office. The case opens like a box of matches: Press two release buttons, and (after some effort) slide out the chassis; inside you'll find a Pentium III-866 CPU and not much else.

The CPU is mounted on a motherboard based on Intel's underpowered 810E chip set, which has low-

quality integrated sound and graphics -a pairing akin to seating an ele-

phant on a tricycle. And 64MB of RAM was a bit lean for a system running Windows Me, especially since the integrated graphics steal between 2MB and 11MB of system memory. Despite its hefty CPU, the Essential 866 fared comparatively poorly in our performance tests, posting an anemic PC WorldBench

#### **Gateway Essential 866**

PRO: Handsome legacy-free system with a nice keyboard.

CON: Low RAM allotment and integrated graphics undermine potential benefits of fast processor.

VALUE: Compact design is ideal for a cramped home office that doesn't require top performance.

List price: \$1179

Gateway

800/315-2536

www.gateway.com

2000 score of 129, largely because of its limited RAM. All other PIII-866 systems we've reviewed have carried 128MB of RAM, and their average score exceeds 150. Nevertheless, the Essential has enough pep to easily handle basic tasks like Web surfing, e-mail, and word processing.

For \$1179, the Essential 866 includes a diminutive 7.5GB hard disk, a puny 15-inch Gateway EV500 monitor, and small Boston BA265 speakers. Gateway disposes of all legacy ports (parallel, serial, and PS/2), providing five USB connections instead. I did like the comfortable, virtually silent keyboard, which has two additional USB ports.

Unlike the Gateway, Polywell's Poly 830KX eschews design innovation in favor of better performance. The dull beige minitower houses an Athlon-800 processor, 128MB of RAM, a 13.6GB hard drive,

#### Polywell Poly 830KX

PRO: This is a fast Athlon-800 budget system.

CON: Comes with an abysmal monitor and sound system.

VALUE: Paired with a better monitor, this would make a good, no-frills system for a home office with a very tight budget.

List price: \$1199

Polywell

800/999-1278

www.polywell.com



evaluated using tests designed

PHOTOGRAPH: MARC SIMON

and a low-end NVidia TNT2 M64 graphics card with 32MB of SDRAM. Running Windows Me, the 830KX earned a 146 on PC WorldBench 2000, about equal to the results turned in by similarly configured Pentium III-800EB PCs.

But the Polywell's better graphics system is wasted on its 17-inch Optiquest Q71 monitor. The unit produced a headache-inducing screen flicker until I bumped its refresh rate to the maximum 85 Hz-and then it displayed distracting gray scan lines.

The Poly 830KX's sound system was annoying, too: The Sound Force 550 speakers crackled when I played music from the CD-ROM drive.

Many budget systems offer speed and plenty of other amenities (see "Power to the People," page 135). But the Essential 866 and the Poly 830KX show that you should look beyond the processor speed to find the best system.

-Seán Captain



THE COMPACT ESSENTIAL 866 from

Gateway won't crowd your desk.

# ThinkPad X20 31U Notebook: Skinny, Fast, and Xtra Xpensive

NOTEBOOK-TOTING travelers usually have to choose between portability and power. IBM's 3.5-pound ThinkPad X20 310 delivers both-but you pay a hefty premium to get them.

The 1.2-inch-thick X20 31U has the horsepower (a 600-MHz Mobile Pentium III) usually found only in larger and heavier notebooks.

And this notebook recorded a PC World-Bench 2000 score of 149, a high rating even in comparison to power notebooks in the same processor class and certainly to other ultraportables. Its battery lasted an exceptional 4 hours,

13 minutes (the battery life for most other ultraportables maxes out at about 3 hours).

But X20 prices start at \$2199, and the preproduction 31U model that I tested costs \$2899 (\$2999 with ethernet)-without the external USB floppy drive (\$99) that comes standard on competing ultraportables.

Toshiba's PIII-600-based Portégé 348oCT, for example, has a price tag starting at \$2499 and includes a floppy drive port and a LANPort

THE IBM THINKPAD X20 31U: Great, but pricey.

Replicator. (A docking station for the ThinkPad costs an additional \$199.)

The 31U is blessed with IBM's great-for-typing keyboard, probably the best available on a subnotebook. Key placement could be an issue for some users, though: The notebook-specific <Fn> key is located where touch typists expect to find the <Ctrl> key. The innovative ThinkLight, a sort of miniature spotlight at the top of the 12.1-inch TFT (active-matrix) display screen, illuminates the keyboard so you can work in low light.

But for all IBM's clever design, I found that the case's beveled edge made grabbing and opening the pair of door switches considerably more difficult than necessary.

Despite the machine's power, long-lasting battery, innovative design elements, and

#### CONTEN

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- **EMachines MSN Companion**



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style, the high base price and lack of desirable extras ultimately negate the value of the ThinkPad X20 series. The 31U is a light notebook with heavyduty power that's great-if your IPO went well.

-Michael S. Lasky

#### IBM ThinkPad X20 31U

PRO: Innovatively designed with a keyboard light; ultralight and thin; great keyboard.

CON: Too pricey, difficult to open.

VALUE: A power machine in a small package if money is no object.

List price: \$2899

IRM

800/426-4968 ibm.com/thinkpad



S T THIS PRODUCT has been evaluated using tests designed by the CENTER PC World Test Center.

# FlexScan L771: A Peck of Pricey Pixels

#### MONITOR

IF YOU LONG to gaze at a big, beautiful LCD monitor but have balked at the cost, consider the Eizo Nanao FlexScan L771. This LCD has a 19.6-inch screen, only slightly smaller than the viewable area of the 21-inch beauties priced as high as \$8000. But the \$5499

#### Eizo Nanao FlexScan L771

PRO: Sharp text, unique controls, four downstream USB ports. CON: It costs an arm and a leg. VALUE: Good choice for stockbrokers, CEOs, upscale reception desks. Street price: \$5499

Eizo Nanao 800/800-5202 www.eizo.com

L771, while obviously not dirt cheap, is far more affordable.

A shipping L771 generally produced acceptable image quality in my subjective tests. On Web pages, photos, and other graphics, however, some colors looked slightly off. Reds, for instance, appeared bright and intense, but yellows seemed muddy. The L771 rendered text more sharply than graphics, in part because its 0.25mm dot pitch is a bit finer than that found in most LCDs. On spreadsheets and word processing documents, letters remained crisp and legible in fonts as small as 8-point.

The four USB downstream ports let you connect digital cameras, scanners, and other devices. Two negatives: The L771 isn't designed to pivot into portrait mode, and the complicated screen controls made me do more button pushing than I liked to adjust the picture. The panel does provide a few unusual controls, including a Smoothing adjustment that sharpens blurred text and graphics.

With its top-notch combination of sleek design, impressive text quality, and ample viewable real estate, the L771 seems perfectly suited for a financial brokerage, a well-



A FINE MONITOR: Eizo Nanao's 19.6-inch FlexScan L771.

heeled CEO's office, or a tony reception area-but be prepared for sticker shock.

-Mick Lockey

## Internet Extras Bolster McAfee Office 3.11

UTILITIES MY TESTS OF McAfee Office 3.11—the major utility suite competitor to Norton System-Works-revealed a vastly improved and well-integrated utility suite. And I didn't run into any of the annoying lockups or error messages that troubled prior versions.

McAfee has largely eliminated redundant and overlapping utilities, leaving a core set of useful programs. These include virtually unchanged versions of McAfee VirusScan

SOUTH OFFICE энимания паю 🦰 🔞 VirusScan McAfee Utilities Internet Guard Dog Pro AND VITES 2 amel **McAfee Firewall** Protection Uninstaller update MCAFFE

A CRISP, CLEAR INTERFACE: The various components of McAfee Office 3.11 are easy to find in the utility suite's new upgrade.

and McAfee Utilities, which is designed to organize your hard drive and back up essential system files, among other uses. You also get a better version of McAfee Uninstaller. which detects unneeded files left on your hard drive by Windows' uninstall function. Finally, the suite adds three utilities for Internet security that in the past were sold separately: Internet Guard Dog Pro, which blocks cookies and protects your personal information; McAfee Firewall; and PGP Personal Privacy, which handles encryption. The \$69 McAfee Office 3.11 works with Windows 95, 98, and Me.

I installed a shipping version of the suite on two test systems. The new setup let me specify what to install and which features to run automatically. A full installation requires 122MB of drive space.

Overall, McAfee Office 3.11 is considerably cleaner and less buggy than prior versions. One caveat: Like any utility suite that delves deep into your system, it can cause problems, especially on systems with odd combinations of older hardware or with slow processors and limited RAM.

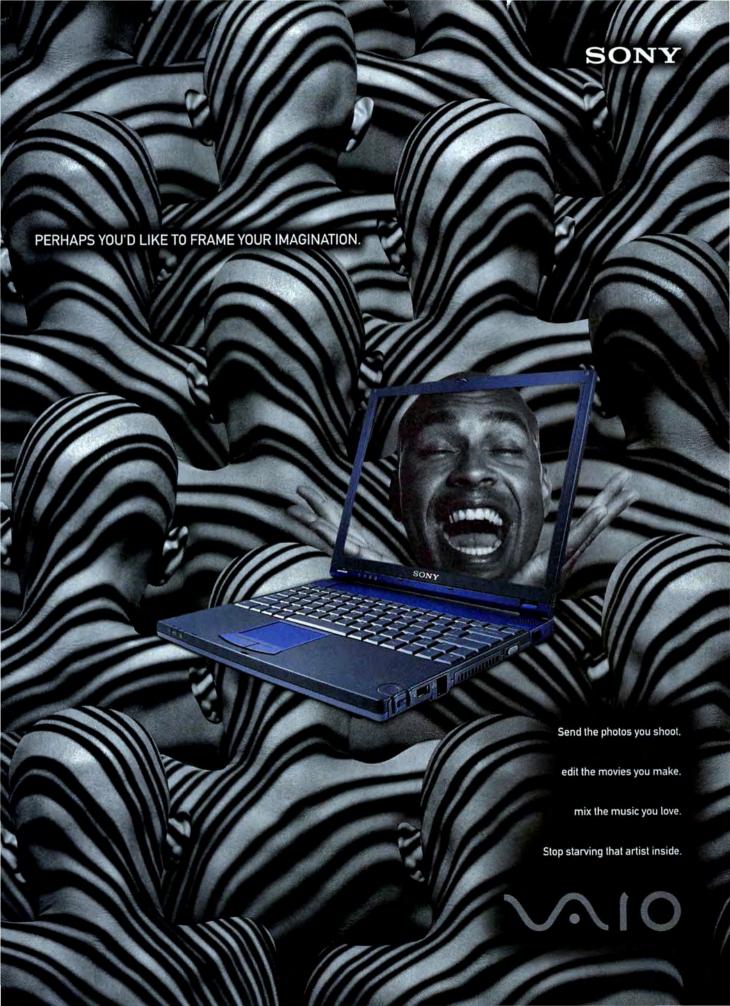
—Stan Miastkowski ▶

#### McAfee Office 3.11

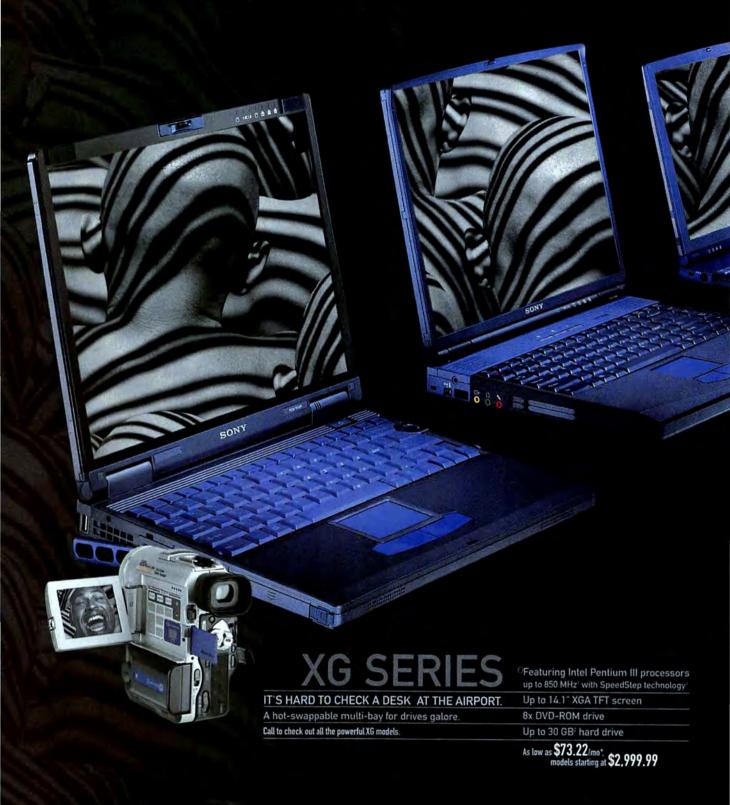
PRO: Well-integrated utility suite, better interface, less crash-prone. CON: Still a disk-space and RAM hog if you install everything. VALUE: Included Internet security products make it an excellent deal. Street price: \$69, free within 90 days of buying McAfee Office 2.0

McAfee 800/338-8754

software.mcafee.com



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SN-1200-PWI Includes Windows® Millennium Edition—the home version of the world's favorite software.

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# The Check's in the E-Mail-Really

#### ONLINE PAYMENTS

FOR SMALL businesses, billing and dealing with paper check payments can be a timeconsuming headache. At a minimum, you have to deposit paper checks and mail out paper invoices; all too often, you must make follow-up calls to ensure that the check is in

#### CheckSpace

PRO: Easy-to-use, inexpensive online billing and payment service for small businesses; can download records to many financial software programs.

CON: Both parties must register; doesn't easily integrate with large, formal accounting packages.

VALUE: Handy alternative to paperbased billing and payments if both sides participate.

Street price: Recipient pays 95 cents per transaction.

CheckSpace 206/749-0966

www.checkspace.com

the mail. Consequently, some businesses add surcharges for handling paper checks.

CheckSpace streamlines the entire billing and payment process by moving it to the Web and to e-mail-if both parties agree to use it. Check-Space effects direct transfers between the bank accounts of its members.

When you sign up, you provide CheckSpace with your bank account and routing information. Activation occurs immediately if you use a credit card for address verification: if not, CheckSpace verifies the data with your bank and sends you an activation code via snail mail. Once you've signed up, sending bills or payments to fellow members is as simple as entering their e-mail address (that's how CheckSpace identifies users) and filling in the amount on a form at the CheckSpace Web site.

When you're ready to set up a payment, tell CheckSpace when you want it to transfer the funds; to request a payment, set a deadline. Checkwhen the person you've billed submits instructions for payment. In my tests, payments showed up when promised. You can export transactions to Excel, Money, QuickBooks, or Quicken file formats.

Convincing larger compa-



CHECK IT OUT: CheckSpace's online payment service for small businesses uses a familiar check-like interface.

Space makes its money by charging the recipient 95 cents per transaction (after the first five, which are free). This expense makes the service impractical for small payments but worthwhile for larger sums. Payments are limited to \$500 per week unless you undergo further credit checks. CheckSpace e-mails you

nies with more complicated accounting procedures to use CheckSpace might be difficult. But consultants and small-business owners who don't have dedicated accounting departments could certainly benefit from this simple and straightforward alternative to paper-based payments.

-Yardena Arar

# Fleet, Petite Portable Storage From Maxtor

DIGITAL VIDEO fans, music lovers, and photo buffs hungry for fast access to massive amounts of portable storage should check out Maxtor 1394 External Storage drives, available in two sizes: 80GB (\$400)

and 40GB (\$280).

STORAGE

Each attaches to your PC or Mac via an IEEE 1394 highspeed connection, more than 33 times faster than Universal Serial Bus 1.1. While this does not match the peak rating of the latest internal IDE hard drives, it's good performance for a secondary hard drive.

A shipping version of the 8oGB model provided an impressive amount of storage space. For example, I found I could squeeze in about 20,000 4-minute, 128-bit-rate MP3 files. In tests using my 128MB PIII-700 system, I discovered that transferring a single 100MB image file (8.59MB per second) went quickly. Transfer speeds were much slower (about 1.7 mbps), however, for a folder stuffed with 100MB of smaller files.

The IEEE 1394 interface lets

you attach the hard disk to your PC or Mac without rebooting, making the Maxtor an excellent choice for resource sharing among multiple PCs. And this 5400-rpm drive is small-1.6 inches by 6 inches by 8.6 inches.

The catch: Few PCs currently include an IEEE 1394 port, so most users will have to install a 1394 PCI adapter card. At press time, Maxtor offered a \$50 rebate on the purchase of its drive and either a \$50 Maxtor 1394 PCI Adapter Card or a \$99 1394

PC Card adapter for notebook computers.

Maxtor's use of slower 5400-rpm disks has allowed it to keep costs down, making this drive one of the most affordable around.

-Tom Spring

#### Maxtor 1394 External Storage

PRO: Holds all your digital extras. CON: You'll probably have to install an adapter to use it.

VALUE: Solid second hard drive at a great price.

List price: 80GB \$400, 40GB \$280

800/262-9867

www.maxtor.com

# Never before has 8U made such an impact on network availability

APC's NEW Symmetra® RM; the first N+1 rack-mountable Power Array™ with all the reliability of Symmetra's patented redundancy and scalability.

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APC introduces Symmetra RM, the first rack-mountable Power Array with N+1 redundancy. Symmetra RM fits into a standard 19" rack, is scalable up to 6kVA of power capacity and has an integrated Web/SNMP Management Card for remote monitoring over the network.

Symmetra RM is compatible with APC's multiple management accessories, like the MasterSwitch™ family for remote rebooting or the Environmental Monitoring Card for temperature and humidity monitoring.

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Symmetra Rack-mount Features:

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modules that eliminate downtime.

· Integrated Web/SNMP management.

· Rack-mountability which saves floor space.

• N+1 Redundancy in just 8U of rack space.



The Symmetra RM fits into any standard 19" enclosure and takes only 8U of space. Its power modules are hot-swappable, so you can scale them up without any downtime. Symmetra RM is also easily manageable with the industry-leading network platforms.

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# Chic Internet Access With 3Com's Audrey

#### NET APPLIANCE

Audrey, 3Com's new \$499 device for accessing the Web and e-mail, displays such a keen sense of style, its last name should be Hepburn.

This slab of off-white-col-

ored plastic with shiny steel buttons frames a responsive 4.75-inch-by-6.25-inch color touch screen. The unit, from 3Com's Ergo line, would look right at home in a wellappointed kitchen or a hip doctor's office. To set it up, just tap an on-screen rosette with Audrey's scepterlike stylus five times to calibrate the screen, and then enter your ISP's basic log-in information. The stylus is

Audrey's crowning touch: When not in use, it rests in a recess atop the unit like an Internet antenna; when you have e-mail, its top blinks with a

persistent green glow.

Some of the 60 keys on Audrey's wireless keyboard were a little too narrow for my large hands. But instead of typing e-mail messages, you can use the stylus to write one on the touch screen (your scribble is sent as a .gif file attachment) or use the built-in microphone to record a message (as a .wav file) up to 3 minutes long.

My preproduction Audrey's custom browser made Web browsing easy. Audrey works with any standard dial-up connection or (if you add an optional \$59 ethernet adapter) with high-speed Internet connections. In my tests, the 56kbps modem regularly connected at creditable speeds, and Web pages loaded quickly.

Interact with the Internet in style with 3Com's Audrey.

-Peter Olafson

#### 3Com's Audrey

PRO: Cool, different, fun to use.

CON: Some keys a little narrow for large fingers.

VALUE: Great for sophisticated Internet newcomers who demand

style in their devices. Street price: \$499

3Com

800/638-3266

www.3Com.com/ergo



SPEND QUALITY Internet time with the Audrey.

# **Corel Graphics Suite Gets Animated**

CorelDraw 10, the latest upgrade to Corel's graphics suite, adds several compelling featuresincluding a new vector animation program-that many people, especially Web developers, should find attractive.

SOFTWARE

The \$569 suite includes ten graphics tools, ranging from drawing and painting applications to font- and media-management utilities. The dis-

#### CorelDraw 10

PRO: Web-animation and image optimization; ten applications and utilities in one handy package. CON: Stiff upgrade price; difficult to navigate between apps. VALUE: Excellent all-around graphics suite for new users; worthwhile upgrade for Web developers.

List price: \$569, upgrade \$249

800/772-6735

Corel

www.corel.com/draw10

parate tools are comprehensive but could be better integrated. As always, the program supplies templates and clip art galore for business and home users, and it has the depth to satisfy desktop publishing pros. Yet CorelDraw 10 costs much less than comparable drawing and painting applications-such as Adobe Illustrator and Photoshoppurchased individually.

The new animation program, Corel RAVE, has a surprisingly simple timeline interface that even novices can use to animate text and graphics. Control object properties (such as position, size, transparency, and blending) over time and save the resulting animations in several formats, including Flash for the Web. RAVE is also great for creating Web buttons. My favorite feature in the beta version of CorelDraw 10 I looked at is its new Image Optimizer, which helps you reduce Web file sizes with visual previews of various compression schemes. You can view up to four different JPEG quality levels side by side, for example, to quickly determine the best one for your project.

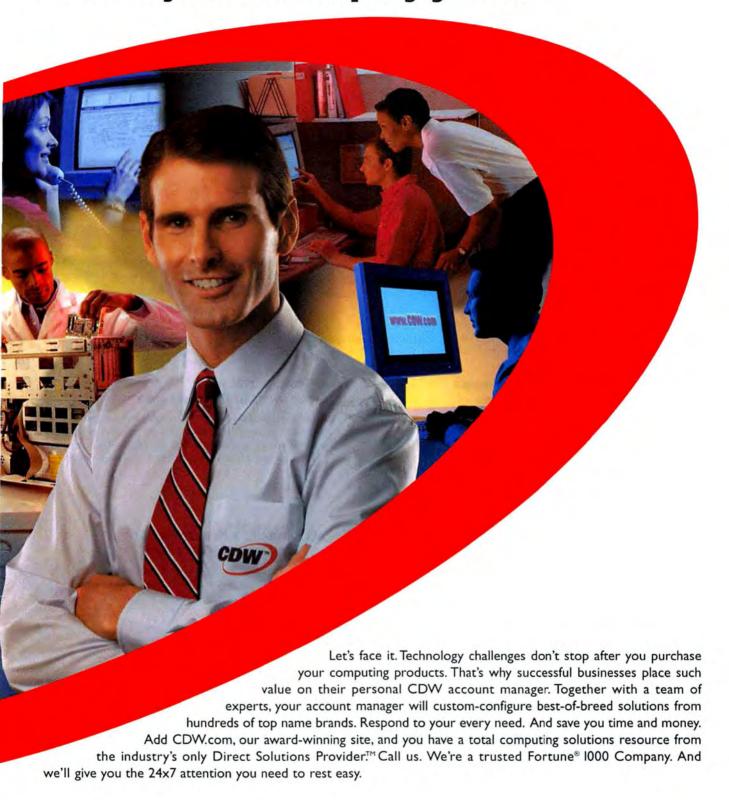
If you own an earlier edition of CorelDraw and need the new Web-production features, by all means upgrade to version 10. Print-oriented folks should look a little closer to see if the slightly steep \$249 upgrade cost is justified.

-Becky Waring



COREL 10'S WEB IMAGE OPTIMIZER lets you easily see the effect of compression on images and pick the best combo of size and quality.

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Save space without losing power with this server solution which offers uncompromising performance and flexibility in a slim package. If space is of the essence for your business, log onto CDW.com for more details and use **SC#16100.** 

#### Compaq ProLiant DL360 Series servers\* 800MHz Intel\* Pentium\* III processor with dual processor capability

The highly acclaimed, space saving Compaq ProLiant DL360 Series servers offer unbeatable performance and unprecedented configuration flexibility. It's the perfect solution for companies requiring ultra high-density rack servers for Web farms and other high volume deployments. The 1U (1.75") rack form-factor houses up to 42 servers in a standard Compag 42U rack.

\$4799.75

CDW 219206

\*\$1000 instant rebate when you purchase FIVE servers (CDW 219206) on the same invoice; certain restrictions apply; call your CDW account manager for complete details (offer ends 12/31/00)



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#### Sony Spressa CD-RW drive 8X4X32X internal EIDE CD-ReWritable drive

Sony Spressa CD-RW drive is ideal for creating your own original data CDs or CD-to-CD copies to add creativity and innovation to your next presentation.

\$206.05 CDW 221048

#### Sony 650MB CD-R 10-pack

Holding up to 650MB of computer data, Sony's 650MB CD-R discs cannot be changed or erased, but have the ability to be added to at anytime.

\$11.34 CDW 209140

# COMPAQ



Hard drives sold separately

# HP ProCurve 2524 Switch 24-port 10/100BASE-TX managed switch

The HP ProCurve 2524 Switch is a stackable and managed 24-port switch with 10/100BASE-TX autosensing per port. This switch offers HP Auto-MDIX on all 10/100BASE-TX and 100/1000BASE-T ports and is ideal for low-cost migration to 10/100BASE-TX managed switching with unlinks

\$789.91 CDW 245297

#### APC Smart-UPS 1400 RackMount 2U 1400VA battery back-up with 6 outlets

With the most advanced performance features available, the slim-line, rack-mount APC Smart-UPS 1400 delivers premium uninterrupted power through brownouts and overvoltages.

\$679.79 CDW 199324



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COMPAQ







SONY









macromedia what the web can be:

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# Carry along compatibles

From security to entertainment, this notebook solution has everything the on-the-go business professional needs. To get organized and learn more, log onto CDW.com and use SC#16101.

#### VAIO PCG-F630 550MHz AMD K6\*-2+ processor

SONY

Packing a fully functionally PC into an easy carrying case, the Sony VAIO PCG-F630 provides an all around computing

solution for your business. From digital entertainment capabilities to mere Internetworking, you'll have everything you need to conduct your business and have a little fun too.

CDW 241634



Digital camera and cable sold separately

#### Simple Technology 128MB memory module For the Sony VAIO PCG-F630

Ensure you have the power you need before you leave the office. Enhance your performance with a 128MB Simple Technology memory upgrade.

\$119.94 CDW 197422

#### Sony Cyber-Shot DSC-S70 3.34 megapixel digital camera

With a maximum resolution of 2048 x 1536 and Memory Stick™ storage, the Sony Cyber-Shot® DSC-S70 digital camera redefines picture quality found in digital imaging.

\$799.95 CDW 213371

#### InFocus LP335 Projector

Weighing only 4.8 pounds, the InFocus LP335 Projector combines 1000 lumens with enhanced video quality and connectivity.

\$4629.40 CDW 217843

#### Handspring Visor Handheld With 8MB of memory

Manage your busy schedule with the Handspring Visor™ Handheld. With a memo pad, address book and calendar, the Visor packs everything you need into one handheld device.

Graphite \$249.00 CDW 226010

# Dependable value

Add value and performance to your office with this desktop solution. To meet your business' computing needs, log onto CDW.com and use SC#16102.

#### AXIS 2100 Network Camera

Ideal for security and surveillance, the AXIS 2100 Network Camera is a digital indoor camera, with direct network attach. No PC is required for this standalone camera, which offers resolution up to 640 x 480 and captures up to 10 frames per second.

\$469.00 CDW 195376

#### NEC/Mitsubishi MultiSync FE700 17" truly flat CRT monitor

With improved brightness and contrast, the NEC/Mitsubishi MultiSync FE700 17" flat-faced monitor, with 16" viewable image size, delivers outstanding features and benefits for your business.

\$275.16 CDW 187171

#### Macromedia Flash 5 FreeHand 9 Studio

Ideal for high-impact Web development, Macromedia's Flash™ 5 FreeHand™ 9 Studio offers complete cross-media publishing solutions, from multi-page layouts to built-in Flash animations.

Upgrade

**Full version** §229.35

CDW 230540

§549.52 CDW 230537



#### HP Brio BA410 Series desktop computer

733MHz Intel\* Pentium\* III processor

Connect to the Internet in an instant with the dependable HP Brio BA410 Series. Each system includes the HP Internet Center™ and an e-business start up kit, allowing virtually anyone to bring their work to the Web. Whether you plan to launch a website or take advantage of e-services, these computers prove to be the simple solution for handling your business needs.

CDW 240710

Monitor sold separately





**Computing Solutions** Built for Business® www.cdw.com 800-306-4239

# Stylish Digital Camera Fits in Your Hand

#### DIGITAL CAMERA

LOOKING FOR A digital camera with style, substance, and an affordable price? Check out Kodak's new DC3800.

Sporting a sleek metallic case, the camera fits conveniently in one hand. It also features a comfortable right-hand grip designed to enhance surefingered snapping.

The DC3800's technical specs are impressive as well. It has a 1.5-inch LCD for framing or viewing images, and its 2.1megapixel CCD (charge-coupled device) can capture bright photographs at up to 1792 by 1184 resolution and can produce lustrous 5-by-7-inch prints and so-so 8-by-10-inch shots. The unit's simple menu system makes changing camera settings easy, too. The included 8MB CompactFlash card can store 15 pictures taken at the camera's Best photoquality setting, 32 at Better, and 58 at Good.

For transferring your snapshots to a computer, Kodak provides a USB card reader that you can attach to a Windows 98- or 2000-compatible PC. The package also includes two standard AA alkaline batteries (rechargeable batteries are optional) and ArcSoft's

#### Kodak DC3800

PRO: Mostly bright pictures, pocketable and lightweight, easy to use. CON: No optical zoom lens, low-light shots appear a bit dark.

VALUE: Affordable, stylish digital camera that's easy on your wallet. List price: \$499

Kodak

800/235-6325

www.kodak.com



Photo Impression software for editing your pictures.

There are, however, a couple of drawbacks. Although the KODAK'S TINY DC3800 won't stretch your pocket or your pocketbook.

DC3800 does give you a 2X digital zoom. it lacks the better optical zoom

lens option. Most indoor and outdoor shots appeared bright and colorful in my tests using a preproduction camera, but some pictures looked a tad fuzzy. The camera worked less impressively when used to take photos under poor lighting conditions (at night or in cloudy weather). In low light, the DC<sub>3</sub>800 captured relatively dark photos, perhaps due to its small flash or because you can't adjust the shutter speed (an advanced setting, by the way, that most high-end digital cameras do offer).

If you need an optical zoom lens or a higher-magnification digital zoom, consider spending a couple of hundred dollars more for the Canon Digital Elph. But if your demands are relatively modest, the DC3800 is a reasonable buy at \$499.

-Grace Aguino

## Web Features Enhance PhotoSuite 4

#### IMAGE EDITOR

IN THE LATEST iteration of its photo editor, PhotoSuite 4, Platinum Edition, MGI Software couples an elegant interface with improved imaging controls. But the package still contains a few quirks.

The software's unintimidating interface includes step-bystep walk-throughs to help you complete tasks. The approach is helpful, but sometimes you must take multiple steps to accomplish common imageediting chores. For example, to rid one photo of the wildeyed alien monster look, I had to go to Prepare/Touchup/Remove Red-eye. In most other packages, a single button takes you to red-eye removal. Furthermore, it's all too easy to adjust a picture to get it just right-and then forget to hit Apply before returning to the previous menu screen, thereby losing your changes. And while the interface resembles a Web browser, I missed having a universal Back button for jumping to a previous screen.

The parallels to a browser are natural, since this shipping version of PhotoSuite incorporates Microsoft Internet Explorer 5. This integration let me seamlessly tap into the Internet without leaving the PhotoSuite environment. For example, I could share photos via a direct interface with Intel's GatherRound.com photoediting site or upload images to Kodak's PhotoNet.com.

Better still, new Web features make it a snap to do everything from generating a Web page using a handful of templates to creating animated GIFs. Plus, you can now create your own screen savers, stitching together as many as 48 images. As bonus, MGI throws in a handy file viewer.

Quirks notwithstanding,

PhotoSuite 4 is an excellent imaging option for people who want a one-stop-does-it-all package. And at \$50 (with an additional \$10 rebate option for registered users), the price is right. If you already have a previous edition of the package, however, upgrade to version 4 only if the program's improved Internet integration strongly appeals to you.

—Melissa Perenson ▶

#### MGI PhotoSuite 4, **Platinum Edition**

PRO: A generally friendly, easy-touse image editing tool; has seamless integration with the Web.

CON: Interface interaction is occasionally counterintuitive.

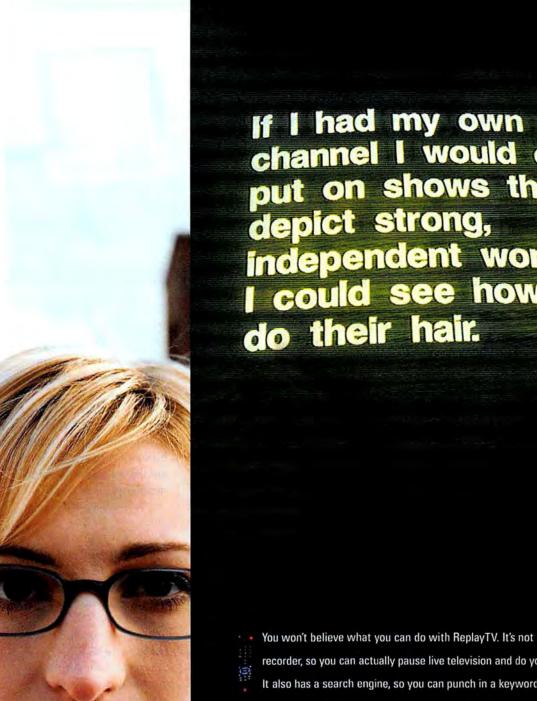
VALUE: Versatile imaging and creativity package for a great price.

Street price: \$50, \$40 for registered users after \$10 mail-in rebate

MGI Software

888/644-7638

www.mgisoft.com



If I had my own channel I would only put on shows that independent women so I could see how they

You won't believe what you can do with ReplayTV. It's not a VCR — it's a digital video recorder, so you can actually pause live television and do your own live instant replays. It also has a search engine, so you can punch in a keyword, say, "Golf," and it will find and record any golf program that comes on - all without videotape. If you're away from home, no problem — just go to MyReplayTV on YAHOO! (tv.yahoo.net) where you can find and record shows on your ReplayTV from anywhere. All this and a free lifetime subscription are why ReplayTV is the critics' choice. Call us at 877-replaytv or visit www.replaytv.com.



# **Dedicated to Dazzling Color Photos**

#### PHOTO PRINTER

THE Olympus P-400 printer has one mission in life; to print photos. And it does an excellent job-albeit at a cost.

The P-400 is a dye sublimation continuous-tone printer. In place of the liquid ink found in ink jets, it uses a wax dye that the printhead heats and then transfers onto special glossy photo paper.

The resulting prints lack the dither patterns typically found on photos printed by ink jets.

#### Olympus P-400

PRO: Dazzling prints.

CON: Expensive printer, can't do large prints.

VALUE: Best for the dedicated amateur or semipro photographer.

List price: \$999

Olympus

877/337-1507

www.olympus.com

Instead, images come out of the machine with rich, true colors and subtle shading, especially in difficult areas such as flesh tones or blue skies. The P-400 also applies a special UV overcoat to protect these prints from losing their luster over time.

If you captured your original image at a decent resolution (say, with a 2-megapixel or better digital camera), the P-400 will print images on its special paper that are virtually indistinguishable from conventional photographs. Although the printer can't provide the level of color matching you get with a high-end professional printer, its driver software offers a good degree of control over how colors are rendered. And it's fast. In an informal test of a shipping unit, a full-page photo took about 2 minutes to

print-impressively speedy, considering the quality.

All this quality comes at a cost: a cool \$999 for the printer. But each print will set you back only \$1.90 in consumables (the required dye sub ribbon cartridge produces exactly 50 prints)-approximately the same cost as with an average ink jet printer.

There are a couple of oddities. Maximum print

size is 7.6 by 10 inchessomewhat narrower than the 8-inch width of standard photo paper. It also can't print to paper larger than that. In contrast, the \$899 Epson Stylus Photo 2000P, one of Epson's top-of-the-line photo ink

OLYMPUS'S truly impressive P-400 photo printer.

> jets, can print to A3 paper, which is 11.7 by 16.5 inches.

Despite its limitations, the P-400 will definitely appeal to photographers who value stunning prints over price.

-Richard Baguley

## HP's Photo Printer for All Seasons

#### PRINTER

MULTIPURPOSE printers are like soap opera actors: They can turn their hands to any role, but they're unlikely to win an Emmy. This holds true for Hewlett-Packard's Photo-Smart 1218 printer, which the

company claims can do double duty as a photo printer and as a document printer.

Though not exceptional at either job, the PhotoSmart 1218 is pretty good at both.

THE PHOTOSMART 1218 from Hewlett-Packard.

The image quality my shipping unit produced was good on text, with only slight blurring at the edge of letters that is typical of ink jets. You'll see some dithering, especially on subtle gradients and in skin tones, but overall the photo

image quality was reasonable for this class of productthough understandably not as good as you'd get with the Olympus P-400 (see above), a dedicated photo printer.

In my informal tests, a typical page of high-quality text

> took approximately 70 seconds to print while a full-page photograph took just under 4 minutes-fair performance but not terribly speedy.

The printer has a sensor that automatically detects paper type. HP also provides CompactFlash and SmartMedia card slots. which allow you to take your media straight from a digital camera and print indexes or images directly.

Though it's not the fastest printer on the block, the Photo-Smart 1218 will get the job done and should suit most home or small-office needs.

-Richard Baguley

#### HP PhotoSmart 1218

PRO: A good multipurpose printer. CON: Not outstanding in any particular category.

VALUE: Moderately priced, good for general home or small-office use. List price: \$499

Hewlett-Packard

800/752-0900

www.hp.com



# Quite a site to see. www.iiyamadirect.com



**TrueFlat** 17" i70A - \$245 19" i90A - \$450



15" TFT - \$849



**Shadow Mask** 17" S700 – \$199



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Corporate inquiries welcome. Call (800) 914-9264







# Netscape Offers Small-Business Help Site

SOME 28 MILLION U.S. companies have fewer than 10 employees, and many of them seek business help online. Netscape's new Netbusiness. com is an easy-to-use collection of third-party offerings-professional services and products, marketing and sales tools, and small-business news and information. The site is informative, easy to navigate, and full of helpful services for a wide range of businesses. But it is not unique.

Netbusiness.com consists of three sections: My Industry,

#### Netbusiness.com

PRO: Free all-in-one destination site for small-business help.

CON: No original content.

VALUE: Provides the ABCs and more for small-business newbies.

Free

Netscape

www.netbusiness.com

My Business, and My Life. My Industry provides daily news updates (via Web content provider YellowBrix) of small-business news. You pick an industryengineering, accounting, or the like-from a drop-down menu, and you thereafter receive just news items related

to that area (you can change your industry designation at any time). If you don't choose an industry, the default option presents you with computer news, networking, industry chat, trade association links, research and references from a major online business info



SMALL-BUSINESS INFORMATION is easy to find at Netscape's new site, Netbusiness.com.

provider, and daily business tips from Inc., the magazine.

I especially liked the state and local government services part of Netbusiness.com, useful for locating city home pages, state travel guides, and government contacts.

In the My Business section,

users can post a Netbusiness card listing their business information (contact info, products, services, and so on) for other site visitors to access. The card data is also listed automatically in AOL's Yellow Pages. You can buy office products and special goods and services from featured providers like Federal Express, Office Depot, and ADP. The Market & Sell section features vendors such as Bigstep.com, a Web page building site, and EFrenzy.com, which bills itself as a global marketplace.

The relatively weak My Life section doesn't venture beyond the usual message boards and business chat rooms plus wire service news.

You can find small-business information at other sitesthe small-business channel at Yahoo, NBCi's AllBusiness. com, and newcomer Small-Business.com, for examplebut Netbusiness.com has the widest and deepest offerings.

-John F. Thorsberg

# Stomp's Click'N Burn Masters the CD

IF YOU'RE LOOKING for an alternative to Adaptec's ubiquitous \$89 (direct from Adaptec) Easy CD Creator Deluxe CD-mastering software, try Stomp's \$60 Click'N Burn CD Pro version 1.5. Click'N Burn Pro is priced \$29 lower than its rival, uses less disk space (5MB compared to 55MB), and lets you master up to four CD-R/RW drives simultaneously. Click'N Burn comes with a bonus: Stomp's CD Stomper Pro labeling kit, which has a handy label-press-on tool.

CD SOFTWARE

In performance, Click'N Burn more than equals Adaptec's offering. In my informal tests of a shipping version with a PlexWriter 12/10/32a, the program created discs from image files 10 to 20 seconds faster than Easy CD Creator Deluxe 4.02, and 20 to 30 seconds faster when writing from cache. Click'N Burn also integrates video CD creation, a feature Easy CD Creator Deluxe implements as a separate included program.

Though Click'N Burn is fast and reliable, its interface is less intuitive than Easy CD Creator's. It does, however, offer a starter page for beginners. You can drag and drop files to your CD layout from Windows Explorer, but the process is neither as quick nor as convenient as Easy CD Creator's built-in file browser. And the program handles only 44.1-KHz MP3 files, which is annoying if you have either higher- or lower-quality files. Click'N Burn's HTML help file is hard to navigate and less useful than its main rival's.

But if you don't mind the

occasional extra steps or the lackluster help file, Click'N Burn offers a good value, especially if you want to burn multiple CDs at once.

-Jon L. Jacobi ▶

#### Stomp Click'N Burn CD Pro 1.5

PRO: Fast, comparatively inexpensive, writes to four CD-R/RW drives simultaneously.

CON: Interface isn't intuitive, HTML help file is a bit weak.

**VALUE:** Performance and features make up for a tough learning curve. List price: \$60

Stomp

949/250-6771

www.clicknburn.com



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The sleek vertical design of the EzPro gives you outstanding performance, extended lamp life, and minimizes "keystoning" — the problem which can result when flat projectors are angled up toward the screen. This means consistent image quality from top-to-bottom and side-to-side. Single-cable connectivity and auto-sync features



Inimizes Keystoning



Ordinary Flat Projectors Can Give You 'Keystoning

make setup fast and flawless every time. DLP "technology ensures consistent brightness, photographic, true-to-life colors and high resolution. With its remote control you can easily manage your presentation from anywhere in the room.

#### FOUR EzPro MODELS TO CHOOSE FROM

FOUR EZPTO MIDDELS TO CHOUSE PROME			
MODEL	RESOLUTION	BRIGHTNESS	Z00M
EzPro718	XGA	1100	YES
EzPro710	XGA	800	
EzPro705	SVGA	800	YES
FzPro702	SVGA	800	a Calling

EzPro's precise data, sharp video and room-filling audio let you deliver your message in the most powerful way imaginable. And, when you get home you can even play your favorite computer game with life sized characters or watch the latest video projected on the expanse of your family room wall.



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# Now You Can Sign on the Digital Line

#### E-SIGNATURES

A RECENT federal law makes electronic signatures as legal as the pen-and-ink variety-at least for contracts that fall within federal jurisdiction. But to be binding, an e-signature must have built-in features proving that you applied it and that the document has not been changed since.

OnSign does the job with a minimum of fuss and no cash outlay whatsoever. We tested a pair of betas-one for Word 97 and 2000, and the other for Outlook 98 and 2000 and for Outlook Express 5 or later. Final (still free) versions should be available for download from OnSign's site by the time you read this.

The first time you run the software, it asks you to scan an image of your signature into your PC and uses this to create your e-persona-a file combining the image with RSA public/private-key encryption technology. If you can't provide a scanned image of your signature, the software gives you a form to sign and fax to OnSign, which will return your e-persona file by e-mail.

After installing your e-persona, you can start e-signing, either by clicking a new toolbar button in Word or by selecting an Outlook menu item (you must also use HTML or RTF formatting to use OnSign with Outlook). The software prompts you for your selected password before the signature appears in either case.

Recipients who have OnSign see your signature; if the document has been changed, it's marked invalid. Recipients without OnSign can click a link to install a viewer. The process isn't too difficult with Outlook, but the viewer didn't work in our tests with Word. An OnSign spokesperson said the problems could have any of several causes and recommended installing the full app instead of using just the viewer.

Also, you can't apply more than one e-signature to a single document; to do that, you need Silanis Technology's corporate-level ApproveIt (\$149 per person). Since the majority of legal documents require multiple signatures, this restriction limits OnSign's realworld usefulness. Still, it's a free introduction to a technology that may someday save quite a few trees.

-Yardena Arar

#### OnSign

PRO: Free, secure e-signature software; company will generate image of faxed signatures.

CON: Works only with recent versions of Word and Outlook, only one signature per document; the software's Word viewer was a bit difficult to install.

VALUE: Previews technology that may soon become common. Free downloads

OnSign

www.onsign.com

# Snazzy New MP3 Player Hits the Gym

#### MP3 PLAYER

NOW INSTEAD of schlepping a portable CD or MP3 player along on a jog, you can grab a ruggedized MP3 player-S3's palm-size Nike PSA Play 120.

This \$300 device looks cool in the palm of your hand or attached to your waistband. Or clip the PSA Play onto a handy elastic band and exercise; it stays firmly in place on your arm. The gray, oval player and its headphones feature snazzy opalescent details.

Navigating the rubberized controls on the player itself is a no-brainer, even when you aren't looking at the buttons. A small remote control sports a circular LCD that shows the current track title, its number,

#### Nike PSA Play 120

PRO: Small, unobtrusive during a workout, looks cool. CON: MultiMedia cards costly. VALUE: Highly portable, tough for music-loving sports buffs. List price: \$300

800/468-5846 www.nike.com



MP3s ON THE GO: S3's new audio player is designed to keep the music flowing smoothly while you are sporting around.

and the length of the song. I found the remote's tiny player controls difficult to depress.

The player connects to a PC via USB, runs for about 11 hours on one AA battery, and comes with a neatly collapsible headset and with software for creating playlists and transferring tracks. You can also use the software to burn CDs and play back songs on your PC. The PSA Play 120 has 64MB of internal memory, which S3 claims can hold up to 2 hours of .mp3 and .wma files. I managed to fit

only 60 minutes' worth at varying levels of compression, however. You can expand the player's storage by adding a MultiMedia Card: A 32MB card costs about \$80, and a 64MB card about \$170.

Sound quality was very good, and the unit withstood some light mountain biking and jogging without a problems-while keeping me happy with a succession of about 15 high-quality tracks. A smaller-capacity version will soon be available.

-Kathleen Cullen



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# Tons of Sweet Music, Too Many Rough Edges

MP3 PLAYER

THE ATTRACTION of hard disk-based MP3 players like SSI's Neo 25 is obvious: They allow you to store loads and loads of music in a portable package. Unfortunately,

NEOPLAYER THE NEO 25 holds over 200

CDs in files.

this particular player has more than its share of problems.

Slightly larger than a handheld cassette player, the device holds a sizable 12GB hard drive. A typical CD encoded at

> 128 kilobits per second (which yields near-CD-quality audio) takes around 55MB of space, so you could fit more than 200 CDs on the Neo. You'll hear only a few of those

CDs on one set of batteries, though: The unit lasted around 3 hours in informal tests of a shipping model.

The player connects to your

PC via a USB port; you install a driver, and the hard drive in the Neo appears as a new hard disk. But I ran into snags: On several PCs I tried, the driver crashed, forcing me to reboot both the PC and the Neo. You get no software to upload MP3 files either. Instead, you have to use Windows Explorer to transfer files. The package also lacks any CD-ripping or MP3encoding software. Many freely downloadable programs will rip CDs and create MP3 files, but having to use a separate program makes the process of getting music onto the Neo more complicated.

The player itself is not well

designed. In particular, the keypad that includes the fastforward and rewind buttons is too small, which makes it easy to press the centrally located menu button by accident.

The Neo 25 costs the same as Creative Labs' much better designed Nomad Jukebox, which I'd recommend instead.

—Richard Baguley >

#### SSI Neo 25

PRO: Holds hundreds of hours of MP3 music files.

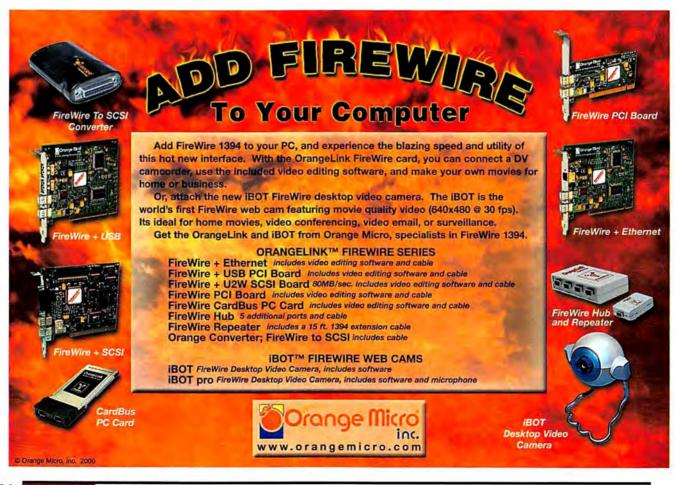
CON: Plenty of rough design edges. VALUE: Attractive category, but the Neo falls short of its competition.

List price: \$499

SSI America

732/560-1996

www.ssiamerica.com



How can you protect your confidential data, as well as your client's data from security threats on the Internet? The answer is SonicWALL—a solution that is hard to hack, yet easy to use.

With a SonicWALL Internet security appliance, you'll benefit from firewall protection and a comprehensive array of integrated security services, including anti-virus, virtual private networking (VPN), strong authentication using digital certificates and Web content filtering. Your data is protected, and your employees remain productive. Plus, SonicWALL's easy installation and low maintenance provides an affordable turnkey security solution without hiring expensive IT consultants. Our products practically maintain themselves, providing automatic free updates so that you can focus on your day-to-day business.

According to International Data Corporation, the average new DSL connection experiences three attempted "hacks" in the first 48 hours. SonicWALL security solutions are the perfect and necessary complement to always-on Internet connections such as DSL and cable. And with more than 75,000 installations worldwide, we're the market leader in Internet security appliances for small and medium-sized businesses. To find out how SonicWALL can benefit your company, contact us at 408.745.9600. Or to learn more,

download our white paper: "Security Issues and Solutions for Small and Medium Business" at www.sonicwall.com/pw3.html



# HARD TO HACK. EASY TO USE.

www.sonicwall.com/pwg.html



### Make Your Own Music Station With Echo.com

ON A QUEST for a station that plays your kind of tunes? Turn off the radio and point your PC's browser to Echo.com. a new Web site that lets you create your own streaming music station. It's easy: You sign up, choose a name for your station, and then select from a diverse list of 80-odd musical genres. From goth rock to gospel, there's plenty here, except for classical music. You can't choose individual songs or artists, however.

Echo.com lets you invite friends to tune in and hear your station's program along with you, chat online, and rate music. The ratings help customize Echo's song selection to your liking, and a skip button is useful for the occasional unappealing tune. Other sites

TARDS COUNTER 592 invite others to listen Ottotunes 0 Playing SKIP ech O suggests ARTIST: Collective Soul ALBUM: Dosage BUY

YOU'RE THE ONE in charge at Echo.com.

like Launchcast and Live365 offer similar streaming music services, but in many cases the programs are too much influenced by other people's tastes.

> With Echo, only you and those you invite rate the music. Another plus is Echo's loyalty program: Listen long enough, and you can convert the points you earn into rewards such as CDs or PC speakers.

> I also liked how the Echo player's interface named the song, artist, and album-great to use for discovering new music-and you can

click to purchase what you find from online music vendors.

My gripes? Songs are often separated by an annoying gap (up to 20 seconds long), and occasionally a song cuts out. But once this beta version's gaps are filled-Echo says a bandwidth boost is coming soon-the site will be sweet music for picky ears.

-Tim Koerner

### Echo.com

PRO: Music that you can fully customize to your own taste.

CON: Frequent annoying gaps between songs, occasional cutouts.

VALUE: This is a great, no-cost way to discover new music.

Free

Echo Networks

www.echo.com

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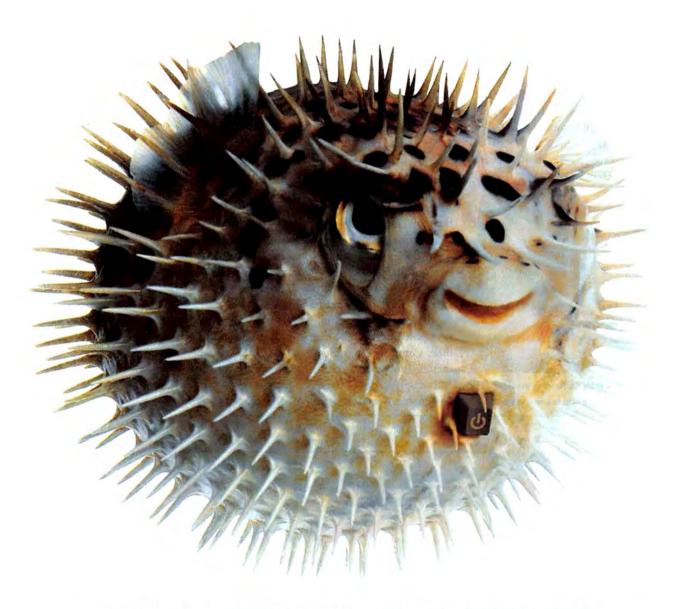
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### An Easygoing Internet Companion

### NET APPLIANCE

THE MSN COMPANION from EMachines is designed for uncomplicated e-mail and Web browsing. In my tests of a preproduction unit, I found

THE EMACHINES MSN Companion provides easy and inexpensive entrée into the online world.

it an easy and inexpensive but rather bulky path to the Web.

The need for a monitor makes this Companion bodyguard-size. Its vertical cabinet is only roughly the size of a

standard hardcover book, with indicator lights in front (including one to signal you when new e-mail is on hand), speakers on the sides, and a handful of ports at the rear. But whereas other Companions include integrated LCD displays, this one doesn't. When I added a 15-inch CRT to the Companion's PS/2-size keyboard and separate mouse, the unit took a up lot of space.

It was definitely easy to use. To get started, I first plugged in local access numbers. A scant 30 seconds after hitting the power button on a keyboard liberally endowed with shortcuts, I gazed at a colorful, easy-to-read display, with email, Web browsing, instant messaging, a search engine, and news at my fingertips. Navigation is easy with the mouse or via plainly labeled icons at the bottom of the screen. If you commit to a 36month MSN package at \$22

per month (a \$792 investment), the \$349 unit is more than covered by a \$400 rebate. That leaves \$51 to apply toward a VGA or SVGA monitor (typical cost: \$100 to \$150).

-Peter Olafson

### **EMachines MSN Companion**

PRO: Easy to set up; easy to use; right price.

CON: Bulkier than competing units, monitor costs extra.

VALUE: Good for Web newbies with spare room but not spare bucks. List price: \$349 (less \$100 to \$400

rebate with 12- to 36-month MSN Internet service contract at \$22 per month); monitor extra

**EMachines** 

877/566-3463

www.e4m.com



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DELL" POWEREDGE 300
Featuring Intel\* Pentium\* III Processors



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So, it comes as no surprise that more people are putting their trust in Dell™ Dell offers the latest technology to choose from – like desktops with Intel® Pentium® III processors and RDRAM, and workstations with 4X AGP Pro graphics, dual processor capability, multi-monitor solutions, and a wide range of software apps. Dell also helps maintain your systems with services like File Library® to keep up with technology and software upgrades. And OpenManage™ on your Dell OptiPlex™ desktop and Dell Precision™ workstation systems provide you with utilities to manage Dell hardware, allowing you to troubleshoot and help prevent system downtime. Now that we're past trust, here's some figures you could really live with.



Dell™ Precision™ Workstation



Dell™ Dimension™ Desktop



Dell™ OptiPlex™ Desktop



### DELL™ DESKTOPS & WORKSTATIONS:

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- Intel® Celeron® Processor at 600MHz
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- Intel® 3D® AGP Graphics; 48X Max CD-ROM
- SoundBlaster 64V Integrated Sound
- Integrated Intel® 10/100 NIC
- MS\* Windows\* Me & MS\* Works Suite 2001 & Norton® AntiVirus™ 2000
- 3-Yr Ltd Warranty<sup>2</sup>; 1-Yr NBD On-site Service<sup>3</sup>

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BUSINESS LEASE: \$19/MO., 48 MOS. ■ 17" (16.0" vis) E770 Monitor, add \$80

■ harman/kardon\* Speakers, add \$30

### DELL" DIMENSION" L

### Affordable Business Desktop

- Intel® Pentium® III Processor at 800MHz
- 64MB SDRAM (up to 512MB)
- 10GB5 (5400 RPM) Ultra ATA HD (up to 20GB5)
- 15" (13.8" vis) E551 Monitor
- Intel® 3D® AGP Graphics; 48X Max CD-ROM
- SoundBlaster 64V PCI LC Sound Card
- harman/kardon\* Speakers
- 3Com® PCI 10/100 NIC
- MS\* Windows\* Me & MS\* Works Suite 2001 & Norton® AntiVirus™ 2000
- 3-Yr Ltd Warranty<sup>2</sup>: 1-Yr NBD On-site Service<sup>3</sup>



899 @ E-VALUE CODE 03814-591108

BUSINESS LEASE: \$25/MO., 48 MOS." ■ 20GB<sup>5</sup> (7200 RPM) Ultra ATA HD, add \$60

### DELL" DIMENSION 4100

### NEW-Advanced Business Desktop

- Intel® Pentium® III Processor at 866MHz
- 64MB SDRAM (up to 512MB)
- 20GB<sup>5</sup> (7200 RPM) Ultra ATA HD (up to 80GB<sup>5</sup>)
- 17" (16.0" vis) E770 Monitor
- 16MB ATI Rage" 128 Pro Graphics
- 48X Max CD-ROM
- Integrated Audio with SoundBlaster Pro/16
- Integrated Intel® 10/100 NIC
- MS\* Windows\* Me & MS\* Office 2000 & Norton® AntiVirus™ 2000
- 3-Yr Ltd Warranty'; 1-Yr NBD On-site Service'



E-VALUE CODE 03814-591111

BUSINESS LEASE: \$33/MO., 48 MOS."

■ 128MB SDRAM, add \$100

### DELL" OPTIPLEX" GXIIO

### Network-Optimized Managed PC

- Intel® Pentium® III Processor at 800MHz
- 64MB SDRAM (up to 512MB)
- 10GB' SMART\* II ATA HD (up to 40GB')
- 15" (13.8" vis) E551 Monitor (up to Flat Panel)
- Intel® 3D® AGP Graphics
- Integrated 3Com® 10/100 NIC
- MS\* Windows\* 2000 Professional
- OptiFrame™ Small Form Factor Tool-less Chassis
- 3-Yr NBD On-site Service<sup>3</sup>

E-VALUE CODE 03814-391109 BUSINESS LEASE: \$28/MO., 48 MOS."

### DELL" OPTIPLEX" GX200

### Network-Optimized Managed PC

- Intel® Pentium® III Processor at 866MHz
- 128MB RDRAM (up to 512MB)
- 10GB SMART II ATA HD (up to 40GB)
- 15" (13.8" vis) E551 Monitor (up to Flat Panel)
- Integrated 3Com\* 10/100 NIC
- Integrated 8MB 4X AGP Graphics
- Integrated AC97 Audio; 48X Max CD-ROM
- OptiFrame' Mini-Tower Tool-less Chassis ■ MS\* Windows\* 2000 Professional
- 3-Yr NBD On-site Service<sup>3</sup>

9 E-VALUE CODE 03814-391114a BUSINESS LEASE: \$41/MO., 48 MOS."

### DELL" PRECISION" 220

Advanced Performance Workstation

- Intel® Pentium® III Processor at 866MHz (up to 1GHz)
- Dual Processor/RAID Capable
- 128MB RDRAM (up to 512MB)
- 10.2GB<sup>1</sup> 7200 RPM EIDE HD (up to 73.4GB5 10,000 RPM SCSI)
- 32MB Diamond\* Viper V770D Graphics Card
- Integrated NIC & Sound; 48X Max CD-ROM
- MS\* Windows\* 2000 Professional
- 3-Yr NBD On-site Service<sup>3</sup>
- 7x24 Dedicated Workstation Phone Tech Support

699 @ E-VALUE CODE 03814-491116 BUSINESS LEASE: \$47/MO., 48 MOS."



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Dell™ PowerEdge™ Server

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299 @ E-VALUE CODE 03815-791112

BUSINESS LEASE: \$36/MO., 48 MOS."

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- Dual Processor Capable
- 64MB 100MHz ECC SDRAM (up to 1GB)
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- Intel® Pro/100+ PCI Ethernet Adapter
- 48X Max CD-ROM
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- 1-Yr NBD On-site Service, Years 2 & 3 Parts & Labor
- 7x24 Phone Support



999 @ E-VALUE CODE 03815-291109

BUSINESS LEASE: \$28/MO., 48 MOS."

- 2nd 10GB<sup>s</sup> 7200 RPM IDE HD, add \$109
- 2nd Intel® Pentium® III Processor at 800MHz, add \$499

### DELL" INSPIRON" 3800

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- Intel® Celeron® Processor at 600MHz
- 12.1" SVGA Active Matrix Display
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- Modular 24X Max Variable CD-ROM
- 8MB AGP 2X ATI Rage Mobility™ 128 3D° Video
- MS\* Works Suite 2000
- MS\* Windows\* Me
- 1-Yr NBD On-site Service<sup>1</sup>



BUSINESS LEASE: \$34/MO., 48 MOS."

- Upgrade to 14.1" XGA Display, only \$200
- Add Internal 56K Capable<sup>6</sup> Modem, only \$39
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- Upgrade to CompleteCare Service from 3-Yr NBD On-site Service, add \$169

DELL" INSPIRON" 4000

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BUSINESS LEASE: \$47/MO., 48 MOS."

■ 3-Yr NBD On-site Service<sup>3</sup>, add \$149

3-Yr NBD On-site Service, add \$169

■ Upgrade to 128MB Memory, only \$150

■ Upgrade to CompleteCare™ Service™ from

■ Upgrade to 10GB¹ HD, only \$100

■ Intel\* Celeron Processor at 600MHz

■ Modular 24X Max Variable CD-ROM

■ MS\* Office 2000 Small Business

■ 59WHr Li-lon Battery

■ MS® Windows® Me

■ 1-Yr NBD On-site Service3

### DELL" POWEREDGE" 1400

NEW-Small Business Value Solution

- Intel\* Pentium\* III Processor at 800MHz (up to 1GHz)
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- 9GB<sup>s</sup> 7200 RPM Ultra3 (Ultra 160) SCSI HD (up to 36GBs 10K RPM)
- Up to 144GB Internal Storage Capacity
- Integrated NIC/SCSI Controllers
- 48X Max CD-ROM
- Dell' OpenManage' Server Management Solutions
- 3-Yr NBD On-site Service<sup>3</sup>; 7x24 Phone Support

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BUSINESS LEASE: \$44/MO., 48 MOS.

- 2nd 9GB<sup>5</sup> 7200 RPM Ultra3 SCSI HD, add \$219
- MS\* Windows\* 2000 Server, add \$799

### DELL™ POWEREDGE™ 2400

NEW-Style, Freedom, Simplicity Notebook Scalable Workgroup Server

- Intel® Pentium® III Processor at 733MHz (up to 1GHz)
- Dual Processor/RAID Capable ■ 128MB 133MHz ECC SDRAM (up to 2GB)
- 9GB<sup>s</sup> 7200 RPM Ultra2/LVD SCSI HD
- (up to 73GB 10K RPM)
- Up to 364GB Hot-swappable Internal Storage Capacity
- Integrated NIC/SCSI Controllers
- 40X Max CD-ROM
- Dell™ OpenManage™ Server Management Solutions
- 3-Yr NBD On-site Service3; 7x24 Phone Support

999 © E-VALUE CODE 03815-291119



BUSINESS LEASE: \$55/MO., 48 MOS."

- 2nd 9GB<sup>5</sup> 7200 RPM Ultra2/LVD SCSI HD, add \$279
- NEW Red Hat\* Linux\*\* 7.0, NOW \$0



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ULTIMATE
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BUYING GUIDE

# A Few of Our Favorite

Scanning of the Second of the

PDA watches and wafer-thin scanners

MP3 players with multiday planners

Flat-panel speakers, a handheld that sings

These are a few of our favorite things.

E-mail on TVs and chairs ergonomic

Build-your-own robots and headsets Plantronic

Portable printers, a notebook that swings

These are a few of our favorite things.

When your drive fails

When your app jams

When the network's down

Just plug in and power up our favorite things

And watch your PC come 'round.\*

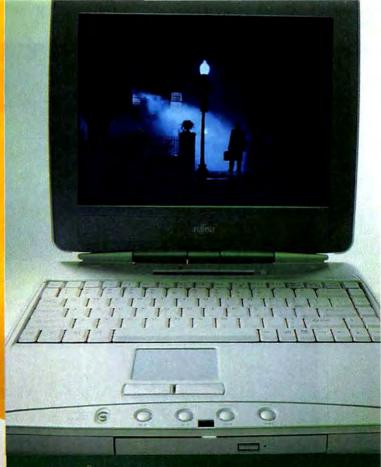
\*With apologies to Rodgers and Hammerstein.

A tech aficionado's shopping guide to the best of this year's gear.

# Things

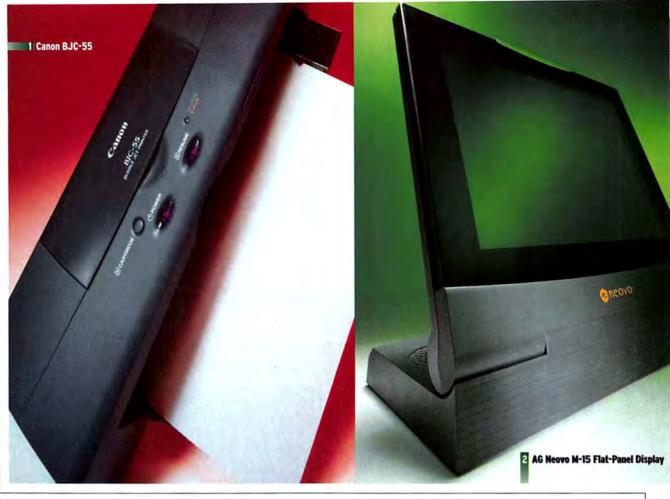
By Michael S. Lasky and Dennis O'Reilly

Photographs By Marc Simon



HAVE YOU EVER BOUGHT a gift for someone because you really wanted the item yourself? That's what happened to us with this holiday gift-buying guide. We looked over dozens of high-tech products, and these are the ones—we admit it—that we coveted for ourselves.

We think you'll want some of these cool tools for yourself or, yes, even as gifts for people on your list. At the end of each review, we sum up the pros and cons (since no product is perfect), and our geekfactor ratings will help you determine the technical know-how, and interest, each product demands (see "Just How Geeky Is That Gift?" page 119).



### Canon BJC-55

### Print Anywhere-Really!

SLIGHTLY LARGER THAN a three-hole paper punch, the bantamweight Canon BJC-55 bubble-jet color printer lets you print wherever you are. Powered by a lithium ion battery or an AC adapter, the printer connects to your PC via a USB or built-in Fast IrDA port. Though it prints only one manually fed sheet at a time (an automatic sheet feeder is available for \$59), the BJC-55 can produce 720-by-360-dpi printouts in a jiff, making it a convenient notebook accessory. It prints only 5.5 pages per minute with black ink, and about 2 per minute in color. An optional \$99 cartridge fits in the ink slot and transforms the printer into an instant scanner. The printer works with any Windows 98/2000/CE, Macintosh, or Palm machine, making it a perfect mobile printer for anyone on the go.

What's hot: Lightweight bubble jet prints anywhere on the fly.

What's not: One hand-fed sheet at a time.

### Geek factor: Medium

· List price: \$349, Canon Computer Systems, 800/652-2666, www.canon.com

### AG Neovo M-15 Flat-Panel Display Expensive, and Worth Every Penny

WANT TO TORTURE your PC-using friends? Invite them to try a flatpanel display such as AG Neovo's

M-15 15-inch LCD for a week, then make them switch back to their old CRT. They won't forgive you until they get a flat-panel display of their own. A CRT's screen flicker is an irritation you may not notice at first, like dress shoes that are just a bit too tight. You sure notice when the irritation's gone, though. Do your poor, beflickered eyes a favor and let them gaze at an ergonomic computer display. The M-15's 1024 by 768 resolution is as sharp as a sunny winter day. If you're a book lover who doesn't read much for pleasure on a PC, you'll find the prospect much more tempting on a flat-panel screen. And if text looks so much better on an LCD, imagine how

lively video becomes. Without question, a look into a flat-panel display such as Neovo's is a glimpse into the future of PCs.

What's hot: Good-bye, eye fatigue! What's not: Good-bye, bank balance! Geek factor: High

 List price: \$949, AG Neovo, 866/246-3680, www.neovo-usa.com

### Creative Nomad Jukebox MP3 Player on Steroids

IT LOOKS LIKE a portable CD player, but Creative Labs' Nomad Jukebox is really an MP3 player that holds more than 100 hours of music. Pow-

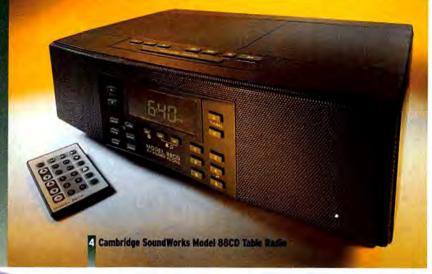
ered by four rechargeable AA batteries (two sets included), the Jukebox plays for 4 hours straight. Its 6GB hard drive, accessed by an onboard Music Library organizer, stores a vast library of MP3 audio files. Transferring MP3 files is easy and quick via the supplied USB cable and PlayCenter 2 software, which doubles as a CD-track MP3 converter (ripper). Integrated EAX controls let you adjust

### THE GEEK FACTOR

### Just How Geeky Is That Gift?

SHOPPING FOR gifts at an electronics store can be risky if you don't consider the recipients' technical savvy or interest. Your eyes may light up when you open a PC's case, but not everyone goes gaga over the latest 64bit graphics board. To avoid mismatches. check each gift's geek-factor rating after gauging the recipient's digital literacy.

High geek: Can actually program a VCR. Medium geek: Still uses a 1999 graphics card. Low geek: "If that's a mouse, where are its little whiskers?'



Creative Nomad Jukebox

Its acute FM tuner helps signals leap through steel buildings in a single click, so you'll be able to hear more radio stations static-free. The integrated subwoofer's bass response gives sound depth and clarity. Auxiliary inputs in the back let the Model 88CD serve as space-saving PC speakers, or you can use the ports to add an audio component, such as a cassette or MP3 player. The built-in speakers are inseparable, but the radio's Wide setting will fool your ears. Also provided are a clock with a large, ambient-light-adjusting backlit LCD and dual alarm settings, and a small remote control.

powered PC speaker set.

MAMBA

What's hot: Great sound, compact size, and it doubles as a PC speaker set.

What's not: CD player is not programmable. Geek factor: Low

 List price: \$349. Cambridge SoundWorks. 800/367-4434, www.cambridgesoundworks.com

What's hot: Holds 100 hours' worth of easyto-load MP3 tracks.

the sound for different environments (audi-

torium, hallway, living room, and so on).

Packed with 20 hours of preloaded music

(jazz, classical, and rock) and audio book

content, the device provides near-CD-quality

sound and works equally well as a home

stereo component or musical road warrior.

What's not: Sheer number of customizable features can overwhelm at first.

### Geek factor: Medium

This Nomad is going places.

 List price: \$499, Creative Labs, 800/998-5227, www.creative.com

### Cambridge SoundWorks Model 88CD Table Radio Audio to Make Your PC Sing



IT RESEMBLES A boxy clock radio with a CD player, but Cambridge SoundWorks' \$349 Model 88CD

Table Radio/CD player by Henry Kloss moonlights as a remarkable, compact subwoofer-

### Eizo Nanao FlexScan L3300

### The LCD for the Rest of Us



FLAT-PANEL LCDs are like six-pack abdominal muscles: attractive and sexy but hard to come by. While abs

of iron require thousands of reps, an LCD monitor has always demanded a gym bag full of cash. Eizo Nanao's FlexScan L330 15-inch LCD is one of the new exceptions to this rule. At \$949, the diminutive monitor provides a 15-inch-diagonal viewing area that effectively replaces your bulky 17-inch CRT. The RGB analog image has 16.7 million colors, but it requires the native 1024 by 768 resolution to avoid a grainy look. Setup is Windows Plug and Play, and user-configuration controls are on the front panel. Your stomach may not be as flat as you'd like, but at least now you can enhance your desktop's appearance with an eye-pleasing flat panel.

What's hot: Easy setup and controls. What's not: Grainy at low resolutions.

Geek factor: Medium

 List price: \$949, Eizo Nanao Technologies, 562/431-5011, www.eizo.com

### Casio PC-Unite BZX-207SCR

A PDA Watch for the Three-Handed YOU SAY A PALM is too much com-

puter for you to lug around? Why not try wearing your Outlook address book on your wrist, along with your schedule, contact list, and to-do list? The PC-Unite BZX-20 has 24KB of memory for storing as many as 340 records in its Schedule (up to 16 characters per record), another 340 items in its To-Do list, and as many as 100 longer Contact records. You can browse text files with up to 8100 characters, but doing so on the watch's 16-character display requires the eyesight of an eagle-and the memory of an elephant. You'll also need the dexterity of a lemur (or the wrist of a squid) to work the eight tiny control buttons under the display window and the two others on either side. An infrared PC link transfers data at 115.2 kbps.

but at a maximum distance of only 8 inches. What's hot: Your Outlook address book



is always one (very small) button away. What's not: The tiny 16-character display. Geek factor: High

• List price: \$129 (online), Casio, 800/836-8580, www.casio.com

### **Green Designs Computer Desk** Elegance and Function for the Office



CONSTRUCTED of high-quality solid mid-Atlantic cherry wood, Green Designs' pricey computer desk

dares to combine elegance and ergonomic functionality. The Green Designs desk arrives unassembled, but putting it together is simple and fun. Most desks consist of particleboard and screws, but this artisan-crafted furniture uses interlocking joinery in the hardwood, so its five components fit together in minutes, much like a jigsaw puzzle. It's the first all-wood desk to have a full-length, 45-inch sliding tray for a keyboard, mouse, and papers. You can easily tuck computer cables into an opening in the top of the desk, where they're held in place with walnut covers. Beneath the desk, brass clips help orga-

nize the cables. Sure it's pricey, but show us any last-a-lifetime art that isn't.

What's hot: Beautifully crafted ergonomic computer desk is functional art.

What's not: Extravagantly priced. Geek factor: Low

 List price: \$2725, Green Designs, 800/853-4234, www.greendesigns.com

### Fuiitsu LifeBook I-4177 Notebook A Moveable Feast



FUJITSU'S LIFEBOOK I-series notebook is a globe-trotter's fantasy. Its built-in DVD drive and 3D audio

make this 500-MHz Celeron system a bargain at \$1499. Sleek lines set off the brushed-silver and blue case. The versatile 6.6-pound I-4177 easily substitutes for a desktop when desk space is scarce. A crisp 12.1-inch TFT screen provides a generous viewing area, and a 56-kbps V.90 modem connects you to the Internet. The S-Video port lets you watch movies on your TV, and a dedicated control panel gives you one-button access to applications, e-mail, and CD

audio controls. With so

many helpful buttons for music and movies, you'll be hard-pressed to get any work done on this wonderful notebook PC.

What's hot: Bargain-priced DVD notebook works as a desktop substitute.

What's not: Awkward keyboard design.

Geek factor: Medium

 List price: \$1499, Fujitsu PC, 877/372-3473, www.fujitsupc.com

### Franklin EBookMan

### A Book and Music Library in Your Pocket



SIZE COUNTS. One look at the display on the Franklin EBookMan, and you can see why. The slim, pocket-

size combo PDA/e-book reader/MP3 player boasts a generous 240-by-200-pixel grayscale LCD screen that displays much more text than the screens of Palms and Pocket PCs. Its name gives away its primary function, but the EBookMan is not just for reading. The built-in speaker, microphone, and headphone jack let you listen to audio books



# At 4:05 my computer **Crashes**. In a few minutes I'm **back up**and running again. Now that's a PowerQuest® **Solution**

Thank goodness I had PowerQuest solutions on my computer, so I could get it back up and running again in minutes. Because I had created multiple partitions with PartitionMagic\*, my applications and personal documents were separated and safe. Not only that, I had previously installed SecondChance™ so all I had to do was roll the system back to the moment before I downloaded the new music application. And, just in case, I had used Drive Image\* to make a backup of my entire system and stored it on CD-R for an occasion just like this.

A few clicks later, my computer was back to normal again. And that's a good thing, because I had a presentation due the next day that went off without skipping a beat. Now that's music to the ears.



### **PartitionMagic**

Organize your hard drive. Run Win 98, Win 2000 and Linux on one machine.

PowerQuest's patented, award-winning partitioning solution allows you to create, resize, merge, and convert partitions on your hard drive without destoying data. PartitionMagic also helps organize and protect your data and run multiple systems.



### SecondChance

Easily undo unwanted changes to your PC.

Recover from system crashes or failed software/hardware installations by rolling your system back to a point in time when it worked properly. This unique solution provides a simple and reliable way to undo the effects caused by a system crash, application conflict, viruses, user error, and other system problems.



### **Drive Image**

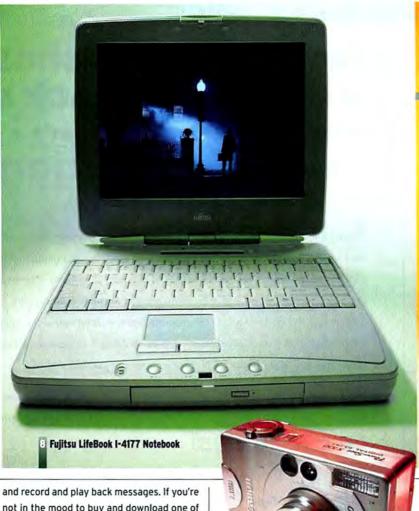
Total system backup for quick disaster recovery.

Drive Image is the solution to clone your hard drive for data protection, backups, disaster recovery, and upgrades. Drive Image allows you to create, store and restore a compressed image of your entire hard drive or separate partitions on removable media or a network.

Get a free demo version of PartitionMagic, Drive Image or SecondChance: by visiting us at www.powerquest.com/freestuff/index.html or call us at 1-888-497-9998



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the more than 12,000 audio books at EBook-Man's partner, Audible.com, use the device to listen to MP3 music. Then there are EBook-Man's calendar, address book, and to-do list. You can handwrite notes and sync the data with your PC via an included cradle and USB cable. All this and a price of only \$130 for the basic model: We say, "Book it, man."

What's hot: Versatile and inexpensive. What's not: AAA battery life can be short. Geek factor: High

• List price: \$130 to \$230, Franklin Electronic Publishers, 800/266-5626, www.franklin.com/ ebookman

### Canon PowerShot S100 Digital Elph Ultrachic Digital Camera

ITS SLEEK, metallic case gives the Canon PowerShot S100 Digital Elph an eye-catching allure

unlike any other digital camera we've seen. The Elph's petite cigarette-case size belies its full-scale functionality. Photographs and prints are sharp, thanks to the unit's 2.1megapixel charge-coupled device. As we point out in our digital-camera roundup on page 150, however, the Elph's picture quality cannot match that of larger cameras in its price range. We also note that the colors of the camera's photos appeared oversaturated. We're still charmed by its coquettish design. The Elph features a 2X optical zoom, an 8MB CompactFlash memory card, a USB port for speedy downloads, a rechargeable NB-1L lithium ion battery with recharger, and Adobe PhotoDeluxe software. Its design alone puts this camera near the top of our wish list.

Canon PowerShot

What's hot: Easy to use and nicely compact. What's not: Pricey; small optical viewfinder. Geek factor: Medium



YOU'VE PROBABLY relied on e-

### **ENote TVemail**

Franklin EBookMan

### As Easy as E-Mail Gets

mail for years, but we bet some people you'd like to communicate with online are as likely to go near a computer as they are to hand-feed a wolverine. They probably own a television set and a telephone, though, and in moments of unabashed honesty they may even admit to feeling a little left out, technology-wise. ENote's TVemail delivers simple and affordable e-mail to your television screen-along with news, information, and at least the promise of online shopping. You'll have to learn to live with its functional limitations, however. For example, you can receive attached images and files, but you can't send them. And as with a number of other products in new technology categories, some of its promised features remain vapor. Still, for many high-tech neophytes, TVemail's

# Clearer, brighter images. Faster, crisper motion.

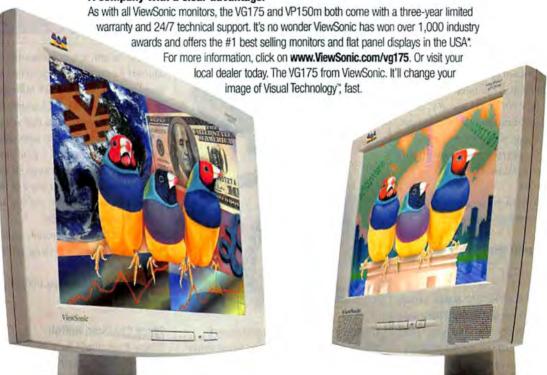
### Introducing the visually stunning VG175 and VP150m Flat Panel Monitors from ViewSonic.

With **SuperClear** screen technology, the VG175 will dazzle your eyes with photo-like image quality, brilliant colors and an ultra-wide 160-degree viewing angle. And the 3X LCD Panel delivers the fastest high-speed video response time available today, up to three times faster than the competition, making it the ideal monitor for viewing DVDs, the Internet, streaming video or any moving images such as sales presentations or demonstrations.

### An innovative design inside and out.

While its big, beautiful 19.0" (17.4" viewable) screen brilliantly showcases this high-response crystal technology, its ergonomic, space-saving design allows you to tilt, swivel—even spin the panel vertically—for complete desktop control. And this same stunning picture quality is available in our VP150m, a 15.0" Multimedia display complete with dual speakers.

### A company with a clear advantage.



(800) 888-8683 • Internet: www.VewSonic.com • Specifications subject to change without notice. • Coppright © ViewSonic Corporation 2000, Corporate manies and trademarks stated herein are the property of their respective companies. "ViewSonic naries as United States" #1 best selling fat panel display by Display Search (02:100) and the leading non-captive monitor brand by Stanford Resources, Inc. (Monitoric 01:100). All rights reserved.













rudimentary e-mail alone amply justifies its relatively low price of \$100 plus \$10 a month. One possible hitch is the telephone link: If your phone jack isn't near your TV, you'll have yet another cord to avoid tripping over. What's hot: Cheap, simple PC-less e-mail.

What's not: You can receive and view attachments, but you can't send them.

### Geek factor: Low

· List price: \$100, plus \$10 per month, ENote. com, 802/288-9000, www.enote.com

### **LEGO MindStorms Dark Side Developer Kit**

A Sci-Fi Holiday

SURVEY THE 567 plastic pieces that make up the \$100 Dark Side Developer Kit, and your first

thought is: How could this jumble of plastic doodads ever be assembled into anything approximating a toy? Fear not. The heart of the set is the Micro Scout miniprocessor with a built-in light sensor, motor, and seven "behaviors" that describe the robots' movements and actions. Clear instructions help you build droids of various complexity. Our Jedi Apprentice droid was more fun to build than we expected. Rummaging through the divided tray holding the many components became a kind of game in itself. This toy is best enjoyed by kids and grown-ups together, but technically precocious youngsters could manage very well on their own.

What's hot: Building the seven different

droids is easier than you might expect. What's not: 567 pieces-yikes! Seven behaviors for the droids is not many.

### Geek factor: High

kl Allseating Vector Command Chair

· List price: \$100, LEGO MindStorms, 415/382-4080, www.legomindstorms.com

### Allseating Vector Command Chair Sit in the Driver's Seat at Your PC

SINK INTO the lusciously soft leather of Allseating's Vector Command Chair, and you'll think

you're behind the wheel of a luxury sports car. But its inspired ergonomic design provides glorious comfort for the desk-bound. Gracefully engineered with a solid cast-aluminum frame, the Vector has precise controls for height, tilt, and knee-tilt. A knob under the seat adjusts the chair's tension based on your weight, which makes shifting positions remarkably fluid. Available in either black or green leather, this five-wheel executive cruiser looks good in both traditional and modern surroundings. It's not cheap, but consider how many hours you sit behind a desk. The most important piece of furniture in your office is likely the one you sit in, so you might as well sit pretty.

What's hot: Stylish, ergonomic, comfortable. What's not: The my-IPO-came-in price.

Geek factor: Low

 List price: \$1249, Levenger, 800/544-0880, www.levenger.com/vector

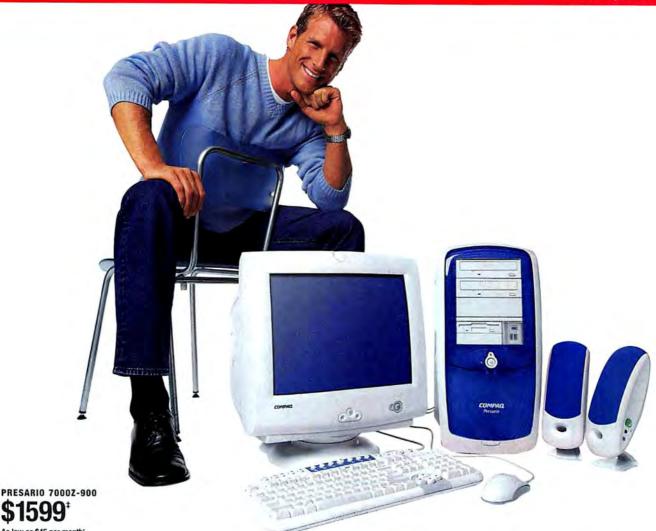
### Canon CanoScan N656U

### "Easy Scanning" Not an Oxymoron



PC SCANNERS of not-so-manyyears ago were a bear to install and use, but that was before

USB. Here's the installation procedure for Canon's CanoScan N656U USB-based 42-bit color flatbed scanner: Take it out of the box. plug one end of the included cable into the scanner and the other into the PC's USB port (you have a 50-50 chance of doing this right the first time, even without checking the instructions), and scan. This scanner has much more going for it than just ease of operation, however. It uses Canon's LED InDirect Exposure technology for greater color fidelity and reduced image distortion.



As low as \$45 per month AMD® Athlon® Processor, 900 MHz, with Performance Enhancing Cache 128 MB 133 MHz SyncDRAM expandable to 384 MB 20.0 GB (7200 rpm) UltraDMA Hard Drive 40X Max CD-ROM Drive 8X CD-RW Drive 32 MB nVidia TNT2 M64 Pro Graphics 56K ITUV90 Modem!

Creative Labs 1373 Audio with 128 Voices JBL Platinum Speakers with Digital Audio Port Compag CV735 17" Monitor (16.0" VIA)

### PICK YOUR FAVORITE COLOR

Change the color of your PC with a MyStyle Accent Kit. Choose from Sapphire Blue, Amethyst Purple, Ruby Red, Emerald Green, or Amber Orange, FREE with purchase of any Presario desktop

## Is it technology or chemistry?

Maybe you're attracted to its looks. Those colorful MyStyle Accent Kits that make it completely yours. Or maybe you're intrigued by the power of its AMD® Athlon™ processor. Then again, its easy access design could make it the ultimate low maintenance relationship. Some things you can't explain. But one thing's for sure. The new Compaq Presario Internet PC, featuring Compag.net powered by MSN;" is perfect for you. So get the PC shown here, or let us build one to your exact specifications. Because at this price, it's a relationship that's bound to click.

> Buy direct from Compaq. Call toll free 1-888-593-6228 compaq.com/athome



### Includes Windows® Millennium Edition — the home version of the world's favorite software.



The top 600-by-1200-dpi optical-scanning resolution makes images sharp as tacks. And the scanner's sleek design (just over 1 inch by 10 inches by 14.5 inches) will have you asking, "Is that a scanner or a very stylish cookie sheet?"

What's hot: Easy installation; sleek design. What's not: Poor integration of features in the ScanGear Toolbox CS software.

### Geek factor: Low

· List price: \$129, Canon Computer Systems, 800/652-2666, www.ccsi.canon.com

### Logitech QuickCam Web

### Eve on the World



IT'S AMAZING how much fun Logitech's crammed into its eyeball-size QuickCam Web Internet

video camera. The USB camera's integrated microphone makes creating sound videos and Webcasts conveniently easy. After the let'smake-funny-faces novelty subsides, you can use the QuickCam to shoot still pictures, produce video e-mail (complete with a built-in player for the recipients), and host live Web

video/audio broadcasts via www.spotlife.com; it can even serve as a motion-detection security device. Speaking of security, the Quick-Cam's no-fair-peeking privacy visor swivels over the camera's lens when you want to leave the device on but block its view. The software bundled with the camera lets you play video games, create video greetings, and conduct teleconferences. It may not be Panavision, but at least now you'll always be ready for your close-up, Mr. DeMille.

What's hot: Inexpensive, easy to set up and use, and fun for all ages.

What's not: The low video quality. Geek factor: High

 List price: \$80, Logitech, 800/231-7717, www.logitech.com

### Easy-to-Love Digital Picture Frame



A \$249 INTERNET-connected digital picture frame might sound like an extravagant novel-

ty, but let it run on your desk for a few minutes, and count how many times it makes you smile. The Ceiva is as simple as it is attractive: Use the supplied telephone-line coupler to attach its built-in 56-kbps modem to your phone line; then push one of its two buttons, and the slide show begins (after you register at the company's Web site on your PC and download your first batch of Ceivasupplied pictures, that is). Press the other button to stop on a single slide. If you want to display your own photos, you can upload them to the Ceiva site, then download them to the picture frame. Or you can download images uploaded by other Ceiva Logic customers you designate, once you receive their permission. If pictures aren't your thing, you can sign up for one of the service's four channels: weather, comics, horoscope, and lottery results. But to make the most of this eve-catching extravagance, let it bring images of your favorite people, places, and things into your home or office.

What's hot: An ever-changing slide show of your choosing delivered automatically to your office, den, living room, or elsewhere.

What's not: You have to go online to set

How to make intelligent, safe and cost-conscious decisions every time you buy insurance. At Quotesmith.com you get instant quotes from over 300 companies - and the freedom to buy from the company of your choice. It's fast and easy.

### Instant Car Insurance Quotes

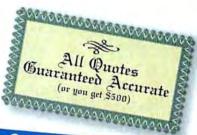
Could you save 20% or more on car insurance? We've made it quick and easy to get instant car insurance quotes from leading insurers, all in one place.

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possible for you to point, click and buy online!



All in one place: instant quotes from leading companies make it easy to comparison shop.





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"SmartMoney Interactive has rated Quotesmith the #1 site for online. insurance quotes.

StrantMoney Online

...make shopping for the cheapest insurance policy much easier

Parents Magazine

"...the largest number of insurers...

Jane Bryant Quinn

re instant insurance quotes than place ofse on earth! Get instant policy coverages, view underwriting esines, buy from the company of year.

guidalines, bay from the company of your information, choice. Take control of your insurance decisions. Have questions? Wanh help? Call us tolf-free at 1-800-556-5393, 7 a.m. to 10 pm. Central Brook-556-5393, 7 a.m. to 10 pm. Central Brook-55

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Fast Accurate Easy Unbiased Private

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Quick-Issue Life Insurance Quotes No medical exams, speedy issue

Instant Medicare Supplement Quotes Quick quotes for ages 65 & up

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term life insurance can give peace of mind.



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health insurance coverage for yourself, your family or your small business. Get instant quotes, scan the marketplace in seconds. You'll find standard plans, PPOs, HMOs, short term plans, dental plans and Medicare supplement plans all in one place at Quotesmith.com. Participation by leading companies eliminates the hassle of buying medical insurance.



slide-show times; price makes it a costly (albeit cute) office or home decoration.

### Geek factor: Low

 List price: \$249. Ceiva Logic, 877/693-7263, www.ceiva.com

### Sonigistix Monsoon MM-700 Speakers Flat-Panel Majesty



WHO SAYS YOU can't combine style with substance? The flatpanel design of Sonigistix's \$149

Monsoon MM-700 speakers lets them stand proudly alongside a stylish new LCD monitor, and the speakers produce decidedly unflat sound. Music and 3D games alike sound crisp and full on the MM-700, while stereo and 3D effects receive definition that's amazing from speakers in this price range. The subwoofer is rated at 22 watts, and each of the satellites at 11 watts, for a total 44 watts of system power. The company's MM-1000 speakers bump these up to 25 and 12.5 for 50 total watts. Our only complaint: The sweet spot for optimum sound is so small. you can leave it simply by leaning backward or forward in your chair. A translucent version of the speakers costs \$20 more-worthwhile for anyone who wants the very latest in PC-design chic.

What's hot: Fat sound in a flat package.

What's not: Tiny sweet spot.

Geek factor: Medium

 List price: \$149, Sonigistix, 877/722-8346, www.monsoonpower.com

**Wacom Graphire Power Suite Tablet** Not for Artists Only

**Wacom Grap** 

WHAT SETS THIS wonderful USB-based graphics tablet/wireless mouse combination apart

from the lower-priced competition is the software that comes with it. For \$100, you get Adobe Photoshop LE 5 for image editing; Corel Painter Classic paint software; and a first-rate set of utilities for handwriting in Microsoft Word, image management and alteration, and hand-gesture recognition. The tablet senses 512 pressure levels, and a handy "eraser" at the end of the stylus lets you delete text or portions of images with a swipe. The cordless mouse has a resolution of 1015 lines per inch; its lack of a rolling ball improves precision and facilitates maintenance. The Sensiva gesture-recognition software allows you to draw symbols to simulate hot keys-a big step toward keyboardless computing.

What's hot: Utilities for keyboardless data entry via handwriting or gesture enhance this solid image-editing suite.

What's not: More expensive than other tablet/wireless-mouse combinations.

Geek factor: Medium

• List price: \$100, Wacom Technology, 800/ 922-6613, www.wacom.com

### Sony MZ-R70PC MiniDisc Walkman Low-Priced Minidiscs for Max Music



SURE, PORTABLE MP3 players are cool, but they play only MP3 files or other digitally encoded

data, and their flash-memory storage media is more expensive than cassette tape or CDs. Sony's MZ-R70PC MiniDisc Walkman changes all that. About the size of a deck of cards, the device comes with a USB interface called the MiniDisc PCLink that records MP3 tracks from your PC in real time, so 74 minutes of music will take you 74 minutes to record. No special software is required-any player/ripper application will send music to the Walkman. The wafer-thin minidiscs cost between \$2 and \$3 each and can hold 74 minutes of real-time audio (even more with digitally encoded tracks). And because the minidiscs record in discrete tracks, you can mix and match downloaded music, CD tracks, and songs off the radio. The Walkman package includes a rechargeable AA battery that powers it for as long as 6.5 hours (standard alkaline batteries can power the device



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MacOpener 2000 is one of several Mac, PC and Palm Organizer programs from DataVize, the compatibility experts. Buy or upgrade at our Web site, or at many software retailers, including:









for 17 hours). Now that's music to our ears.

What's hot: Records music cheaply from many sources.

What's not: The tiny size of the player's control buttons makes them irksome to use

### Geek factor: Medium

 List price: \$250, Sony, 800/222-7669, www.sony.com

### Plantronics LS1

### Headset Knows What You Say



PC VOICE recognition will likely become mainstream when the products become easier,

more accurate, and/or less expensive than other input alternatives, Plantronics' \$50 LS1 stereo headset is a big step in that direction, promising to increase the accuracy of voice-recognition software. Informal testing indicates the product indeed delivers improved audio. (An added bonus: You can use the headset to listen to CDs and music files, although Plantronics' dedicated hi-fi stereo PC headset, the \$80 HS1, is a much better choice for gamers and audiophiles.) The LS1's features include an inline volume-control module and microphone mute, 100-Hz-o-8-KHz frequency response, a 3-meter cord, and swivel-mount ear cushions for added comfort. While voice recognition is the headset's

primary application, teleconferencers and Internet-telephone users will find it an affordable and useful PC accoutrement.

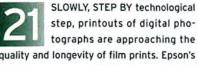
Al Epson Stylus Photo 875DC

What's hot: Better voice recognition, low cost, inline microphone mute/volume control. What's not: Narrow frequency response.

### Geek factor: Low

 List price: \$50, Plantronics, 800/544-4660, www.plantronics.com

### Epson Stylus Photo 875DC Digital Camera Complement



quality and longevity of film prints. Epson's \$299 Stylus Photo 875DC six-color ink jet printer provides the latest nudge in that

direction, with a top resolution of 1440 by 720 dpi. Epson claims that its Photo Inks and Premium Glossy Photo Paper look as good and last as long as photo lab prints when they're properly stored. We don't know about that, but the printouts we made in 1440 Photo Mode looked suitable for framing. The company estimates that a single 8-by-10-inch print in 1440 PhotoMode will cost about \$1.25. An optional \$39 adapter lets you produce 4-by-6-inch prints edge to edge (without borders); a 50-print roll of the paper costs about \$20. If you use removable-storage PC Cards with your digital camera, you'll appreciate the printer's built-in reader.

What's hot: Epson's ink and paper technologies create high-quality, long-lasting prints. What's not: Potentially high cost per print in high-resolution 1440 Photo Mode.

### Geek factor: High

 List price: \$299, Epson, 800/463-7766, www.epson.com

Michael S. Lasky is a senior editor and Dennis O'Reilly is a senior associate editor for PC World. Associate Editor Grace Aquino, Staff Editor Eric Dahl, and Editor/Reporter Tom Mainelli also contributed to this article.

RESTAINED THE



# COTTHE WORLD'S LOTHEST GR AND MULIMEDIA BO

The world said gimme the fastest, gimme the most powerful, gimme the most realistic, gimme the coolest featured graphics boards money can buy – gimme RADEON™!

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HOME COMPUTERS ARE TRUE POWERHOUSES THESE DAYS. WE REVIEW 15 SYSTEMS TO HELP YOU FIND THE BEST PICKS FOR SERIOUS TELECOMMUTING OR AFTER-HOURS FUN.



THERE'S NO PLACE like home for PCs. Once considered corporate systems' little siblings, home PCs have grown up: These machines now match or exceed their business cousins' performance and outpace their sales. As vendors battle for the home market, low prices put undreamed-of speed and capacity within reach of even the most budget-conscious PC buyers.

What to choose? We scoured the shelves and searched the online stores to find the best home bargains this year. Whether you're pinching pennies so you can afford a second PC or are ready to drop a bundle on a high-powered home office system or a muscle machine for gaming, you'll find what you're looking for here.

### **FAST AND LUXURIOUS**

HOME PCs passed the millennium mark in 2000: Every system in this year's power lineup runs at 1000 MHz or faster. Polywell's Poly 830KR, propelled by an Athlon-1000 CPU, grabbed top speed honors with a score of 167 on our PC WorldBench 2000 tests. But Gateway's Select 1100 Deluxe, with its Athlon-1100 CPU, and Sony's VAIO Digital Studio RX28oDS, featuring a Pentium III-1000, tied for second just three points behind. All five power systems also have state-ofthe-art graphics cards equipped with the NVidia GeForce2 chip set and either 32MB or 64MB of video RAM.

Performance should continue to go up in coming months, as AMD introduces 1.2-GHz Athlon chips that work with doubly fast DDR RAM. Rival Intel is also betting on higher performance with its

	POWER SYSTEM: \$2000 AND OVER	Month tested	★ Overall rating	Street price (9/15/00)	PC WorldBench 2000 performance score 1	Base configuration <sup>2</sup>
1	Dell Dimension XPS B1000r 800/388-8542 www.dell.com	Nov 00	91	Expensive: \$2829	Good 158	Very good: Pentium III-1000, 128MB of RDRAM, 256KB L2 cache, 30GB hard drive, midsize tower, 19-inch monitor, Windows Me
2	Gateway Select 1100 Deluxe 800/315-2536 www.gateway.com	Nov 00	87	Expensive: \$2933	Very good 164	Very good: Athlon-1100, 128MB of SDRAM, 256KB L2 cache, 46GB hard drive, midsize tower, 19-inch monitor, Windows Me
3	Polywell Poly 830KR 800/999-1278 www.polywell.com	NEW	85	Inexpensive: \$2299	Outstanding 167	Very good: Athlon-1000, 256MB of SDRAM, 256KB L2 cache, dual 30GB SCSI hard drives, midsize tower, 19-inch monitor, Windows M
4	Sony VAIO Digital Studio RX280DS 888/315-7669 www.sony.com/pc	NEW	84	Average: \$2700	Very good 164	Good: Pentium III-1000, 128MB of SDRAM, 256KB L2 cache, 60GB hard drive, minitower, 17-inch monitor, Windows Me
5	Compaq Presario 7000T 800/345-1518 www.compaq.com	NEW	82	Very expensive: \$3076	Good 155	Very good: Pentium III-1000, 128MB of SDRAM, 256KB L2 cache, 75GB hard drive, midsize tower, 19-inch monitor, Windows Me
	MIDRANGE SYSTEM: \$1200 TO \$1999	ercent of overa	II rating >	Price: 10 percent	Performance: 20 percent	Base configuration: 10 percent
1	Dell Dimension 4100 PIII-800 800/388-8542 www.dell.com	Nov 00	96	Average: \$1579	Very good 145	Good: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, midsize tower, 17-inch monitor, Windows Me
2	NuTrend Athlon Ultra 2 888/482-6678 www.nutrend.com	NEW	88	Average: \$1739	Very good 154	Very good: Athlon-850, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
3	ABS Multimedia System 2 800/876-8088 www.buyabs.com	NEW	87	Average: \$1599	Outstanding 160	Very good: Athlon-950, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
4	Gateway Performance 866 800/315-2536 www.gateway.com	NEW	86	Average: \$1709	Very good 157	Good: Pentium III-866, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, midsize tower, 17-inch monitor, Windows Me
5	HP Pavilion 87001 800/752-0900 www.hp-at-home.com	NEW	85	Expensive: \$1885	Very good 145	Good: Pentium III-866, 128MB of SDRAM, 256KB L2 cache, 40GB hard drive, midsize tower, 17-inch monitor, Windows Me
	BUDGET SYSTEM: UNDER \$1200 P	ET SYSTEM: UNDER \$1200 Percent of overall rating		Price: 15 percent	Performance: 15 percent	Base configuration: 10 percent
1	HP Pavilion XE763 800/752-0900 www.hp-at-home.com	NEW	86	Inexpensive: \$899	Satisfactory 104	Good: Celeron-700, 64MB of SDRAM, 128KB L2 cache, 15GB hard drive, minitower, 15-inch monitor, Windows Me
2	NuTrend Duron Power 2 888/482-6678 www.nutrend.com	Oct 00	85	Average: \$999	Outstanding 133	Very good: Duron-700, 128MB of SDRAM, 64KB L2 cache, 20GB hard drive, minitower, 17-inch monitor, Windows 98 SE
3	Tiny Millennium Home Power 800 877/417-4178 www.tiny.com	NEW	84	Expensive: \$1199	Outstanding 134	Very good: Pentium III-800E, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, minitower, 17-inch monitor, Windows Me
4	Polywell Poly 700KD 800/999-1278 www.polywell.com	Oct 00	82	Expensive: \$1199	Very good 131	Very good: Duron-700, 128MB of SDRAM, 64KB L2 cache, 20GB hard drive, midsize tower, 17-inch monitor, Windows 98 SE
5	Kaypro 4100 888/352-9776 www.kaypro.com	NEW	74	Average: \$1029	Very good 121	Very good: Pentium III-650, 64MB of SDRAM, 256KB L2 cache, 13GB hard drive, minitower, 17-inch monitor, Windows 98 SE
i	Best Buy P	ercent of overa	all rating	Price: 20 percent	Performance: 10 percent	Base configuration: 10 percent

A system's performance word score is relative to the scores earned by other PCs in the same price category running the same operating system. For more details, see "Your Guide to the Top 100" on page 223,

upcoming 1.4- and 1.5-GHz Pentium 4 processors.

You'll see plenty of speed in this month's midrange PCs, and in the budget category as

well, where AMD's zippy Duron processor stands out among its low-cost peers. The Duron is AMD's answer to Intel's Celeron CPU, and in our tests the 700-MHz Durons put their Celeron counterparts to shame. Two Duron-based systems, Nu-Trend's Duron Power 2 and Polywell's Poly 700KD, outran our Best Buy, the



Celeron-700-based HP Pavilion XE763, by more than 25 percent on our PC World-Bench 2000 tests. (At a mere \$899, however, the Pavilion

still captures top honors for overall value.)

This year, 17-inch monitors have become the standard for home systems, and many power and midrange PCs ramp up to 19-inch displays. Only one system, HP's budget Pavilion XE763, comes with a 15-inch model, though a very high quality one. Likewise, DVD-ROM drives are almost ubiquitous: Only the low-end Kaypro 4100 and Polywell's high-end Poly 830KR lack them. Polywell compensates by equipping the 830KR with a CD-RW drive and two high-speed 30GB SCSI hard drives in a RAID configuration-an ideal setup for very demanding power applications like digital video editing.

### DON'T FORGET SUPPORT

AT HOME, no IT technician can hear you scream. So when you buy a home PC, remember that you're buying the

Extra features	Setup/ ease of use	Graphics	Reliability/ support	Comments
Very good: NVidia GeForce2 GTS graphics board with 64MB of DDR SDRAM, 12X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem	Outstanding/ Good	Very good	Outstanding/ Good	PRO: Smooth graphics and good colors; \$140 price drop this month. CON: Speakers are not first-rate; monitor blurs at high resolutions.
Very good: NVidia GeForce2 GTS graphics board with 64MB of SDRAM, 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem	Good/ Very good	Very good	Fair/ Fair	PRO: Excellent performance, monitor, and sound system. CON: Premium processor imposes premium price.
Very good: Leadtek WinFast GeForce2 GTS graphics board with 32MB of GGRAM, 8X/4X/32X CD-RW drive, V.90 modem	Good/ Good	Good	³/Fair ⁴	PRO: Fastest home system we have seen; reasonable price for the performance. CON: No DVD-ROM drive; minimal documentation.
Very good: Asus AGP-V7100 graphics board with 32MB of SDRAM, OX DVD-ROM drive, 8X/4X/32X CD-RW drive, network card, V.90 modem	Satisfactory/ Good	Good	Fair/ Poor	PRO: Fast, stylish PC with a beautiful monitor is ideal for video and graphics fans. CON: Very chintzy sound system.
Very good: NVidia GeForce2 GTS graphics board with 64MB of SDRAM, 6X DVD-ROM drive, 8X/4X/32X CD-RW drive, network card, V.90 modem	Good/ Outstanding	Very good	Poor/ Fair	PRO: Fast, fully loaded system. CON: Most expensive PC on the chart; second-rate speakers.
Extra features: 10 percent	Setup/ease of use: 5 percent	Graphics: 15 percent	R & S: 30 percent	
Good: NVIdia GeForce2 GTS graphics board with 32MB of DDR SDRAM, 2X DVD-ROM drive, V.90 modem	Outstanding/ Good	Good	Outstanding/ Good	PRO: Smooth graphics; \$110 price drop this month adds to value. CON: Lacks setup poster; access to slots slightly hindered.
Fery good: Leadtek WinFast GeForce2 MX graphics board with 32MB of DRAM, 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem	Satisfactory/ Outstanding	Very good	³/Fair ⁴	PRO: Fast for its processor class; great four-channel sound system. CON: Movies look dark; monitor flickers at high resolution.
Good: Leadtek WinFast 3D S325 graphics board with 32MB of SDRAM, OX DVD-ROM drive, V.90 modem	Satisfactory/ Satisfactory	Good	³/Fair *	PRO: Strong sound system. CON: Low frame-rate scores on game tests; DVD movies appear dark.
<b>Good: N</b> Vidia TNT2 M64 graphics board with 32MB of SDRAM, 16X DVD- ROM drive, V.9 <mark>0</mark> modem	Satisfactory/ Good	Good	Fair/ Fair	PRO: Fast for its processor class; lots of room for upgrades. CON: Should have a CD-RW drive at this price.
Fery good: Asus AGP-V3800 graphics board with 16MB of SDRAM, 2X DVD-ROM drive, 8X/4X/32X CD-RW drive, network card, V.90 modem	Outstanding/ Good	Good	Fair/ Fair	PRO: Comes with handsome monitor and network card. CON: Slowest system we've seen for its processor class.
Extra features: 10 percent	Setup/ease of use: 10 percent	Graphics: 10 percent	R & S: 30 percent	
<b>fery good:</b> integrated graphics, 8X DVD-ROM drive, V.90 modem, nk jet printer	Good/ Outstanding	Limited	Fair/ Fair	PRO: Surprisingly good monitor and sound system for the price; includes an HP printer. CON: Slow system with poor graphics; only available at Wal-Mart.
Good: Leadtek WinFast TNT2 M64 graphics board with 32MB of SDRAM, OX DVD-ROM drive, V.90 modern	Satisfactory/ Good	Satisfactory	³/Fair ⁴	PRO: Price drops \$100 this month; great sound for a budget machine. CON: Monitor blurs text at high resolutions; DVD playback was a bit dark.
Very good: NYidia TNT2 M64 graphics board with 32MB of SDRAM, 2X DVD-ROM drive, V.90 modem, ink jet printer	Good/ Good	Satisfactory	7201	PRO: Includes generous software bundle and an ink jet printer. CON: CPU takes this budget PC far, but it could have gone farther.
Good: Micro-Star MS-6330 graphics board with 32MB of SDRAM, OX DVD-ROM drive, V.90 modem	Very good/ Satisfactory	Good	³/Fair ⁴	PRO: Surprising power; ample expansion room. CON: Speakers sound a bit muddy; game play is somewhat choppy at high resolution.
Satisfactory: integrated ATI Rage Pro graphics with 8MB of SDRAM, 22X-48X CD-ROM drive, V.90 modem	Satisfactory/ Good	Limited	³/Fair *	PRO: Good price for a PIII-650 system. CON: Integrated graphics lead to poor game performance; sound system is weak.
Extra features: 10 percent	Setup/ease of use: 10 percent	Graphics: 10 percent	R & S: 30 percent	

than 15.5 Inches); and horizontal cases as desktops (5 Inches or taller) or compacts (shorter than 5 Inches).

to give a rating.

on responses to anonymous calls for tech support

company's service as well as its hardware.

Neither the power Best Buy, Dell's Dimension XPS B1000r, nor the midrange Best Buy, the Dimension 4100 PIII-800, is the fastest system in its class. But both are solidly built machines from a company that has consistently received top marks for reliability and support in our Reliability and Service survey of PC World readers. Watch for the results of our latest survey in next month's issue of PC World.

### POWER

### [1] Dell Dimension XPS B1000r



WHAT'S HOT: Let the games begin! Boasting a GeForce2 GTS graphics card with a gener-

ous 64MB of DDR SDRAM and a 1-GHz Pentium III processor, the Dimension XPS B1000r is a stellar gaming machine, earning the highest overall score in our graphics tests. While not the fastest power system in our lineup, the Dimension XPS B1000r still scored a very respectable 158 on our PC WorldBench 2000 tests.

WHAT'S NOT: For \$2829, it would have been nice had Dell included a network card and a better sound system than the merely respectable Harman Kardon HK-595 speakers and subwoofer. The 19-inch Dell P991 Trinitron monitor displayed rich, full colors but lacked crispness and blurred small fonts at 1280 by 1024 resolution-performance atypical of Dell's usually excellent monitors.

WHAT ELSE: The system includes a Microsoft Internet Pro keyboard with seven programmable buttons. Dell has included a reference and troubleshooting manual to cover the basics, and backs that up with a comprehensive online help system.

BEST USE: The XPS Brooor is a great home or home office system for gaming and graphics aficionados.

### [2] Gateway Select 1100 Deluxe

WHAT'S HOT: This system has great sights and sounds. It shares top honors on our 3D gaming tests with the Dell Dimension XPS B1000r. And the 19-inch Gateway



VX920 monitor looked sharp at all resolutions; even very small text blurred only a bit at 1600 by 1200. The Boston Acoustics Digital BA7500G sound system's four satellite speakers and huge subwoofer punch out full, clear sound. A bundled copy of Microsoft Office 2000 Small Business Edition gets the work done.

WHAT'S NOT: The PC's \$2933 price means that you have to bleed for all that speed. The same configuration with a slightly slower CPU would cost a lot less.

WHAT ELSE: The keyboard has four programmable buttons as well as complete audio and CD player controls. The system provides two free PCI slots and two open internal bays for expansion. Setting up the Select 1100 Deluxe is a breeze, thanks to a clearly illustrated poster and an easily comprehensible manual.

BEST USE: This workhorse can handle any load, from games and multimedia to spreadsheets and databases.

### [3] Polywell Poly 830KR

WHAT'S HOT: With a PC WorldBench 2000 score of 167 and a price of \$2299, the Polywell Poly 830KR is the fastest and least-expensive power system here.

WHAT'S NOT: Small text was readable at 1280 by 1024 resolution, but it wasn't as sharp as we'd expect from a 19-inch monitor. The system has no DVD-ROM drive and minimal documentation.

WHAT ELSE: The Poly830KR comes with a CD-RW drive and dual 30GB SCSI hard drives in a RAID configurationproviding plenty of high-speed storage for music, graphics, and video files.

BEST USE: Plenty of power, nice graphics, and ample storage make this system a good choice for a demanding home office user or a multimedia jockey.

### [4] Sony VAIO Digital Studio RX280DS

WHAT'S HOT: The VAIO Digital Studio is built for multimedia apps. Its Pentium III-1000 CPU helped it produce a PC WorldBench 2000 score of 164-one of the highest we've seen for a home system-giving it plenty of speed to crunch out graphics or play DVD movies on the vivid, colorful 17-inch Sony Trinitron monitor. Sony bundles a full suite of userfriendly software for capturing, storing, and editing digital video and still images.

WHAT'S NOT: In light of the system's hefty \$2700 price tag and multimedia orientation, we were disappointed by its integrated sound and small pair of Sony speakers, which are wholly inadequate for anyone interested in high-quality audio.

WHAT ELSE: Game play was smooth on all our 3D gaming tests. The front of the VAIO's stylish lavender case features a USB port for digital cameras or other

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BEST USE: This great family PC lets you work with home videos and pictures.

[5] Compag Presario 7000T

WHAT'S HOT: The Presario 7000T dazzles with great graphics and a full set of features. Its 1-GHz Pentium III processor

and fast NVidia GeForce2 GTS graphics card with a generous 64MB of SDRAM for video memory helped it produce good scores on both our PC WorldBench 2000 and our 3D game tests. The front of the case offers two USB ports, plus an IEEE 1394 port for downloading digital video. You will have no problem storing video or MP3 files on the vast, 75GB hard drive or, alternatively, by using the 8X/4X/32X CD-RW drive. The 7000T's ethernet card can accommodate a home network or a high-speed Internet connection.

WHAT'S NOT: The \$3076 total price is a lot to pay for any PC these days-especially one with a weak sound system. The twin JBL Platinum speakers fall far below the level of performance we would expect on a system at this price.

WHAT ELSE: Compaq's 19-inch MV940 monitor displayed rich colors, accurate images, and sharp small text up to a resolution of 1280 by 1024. Beginners and intermediate users will appreciate the well-illustrated setup guide and the good, albeit basic, manual.

BEST USE: The 7000T can manage anything you throw at it: games, big spreadsheets, databases, or multiple teenagers with thousands of music files.



NCE UPON A TIME, the task of choosing a PC was easy: The faster the CPU, the better the system. But those simple days are gone. Even today's slower CPUs may provide all the speed you need. In fact, CPUs with lower MHz ratings sometimes provide better performance than those with higher numbers.

When choosing CPU speed, be honest with yourself. You may want the fastest PC on the block, but do you really need it? If you play demanding 3D games, work with large multimedia files, or are designing the next generation of nuclear weapons, maybe you do. Otherwise, probably not.

### **CHOOSE WISELY**

SAY YOU'RE CHOOSING between a Pentium III-733 system and one based on the Pentium III-1000. The 1000-MHz unit would be only about 14 percent fasteraccording to our PC WorldBench 2000 scores-and it would probably produce no discernible difference in tasks like Web surfing or word processing.

But the bragging rights to a 1-GHz system could cost you as much as an extra \$1000. That money might be better spent on a high-performance graphics card or a powerful sound system-or maybe on a weekend in the tropics. (See "Tips for Choosing the Right Components" on page 144.)

# by its clock speed

The speeds of today's budget home PCs match those of last vear's muscle machines. Three systems under \$1200 in this review-NuTrend's Duron Power 2, Polywell's Poly 700KD, and Tiny's Millennium Home Power 800-posted PC WorldBench 2000 scores that are comparable to the scores of systems we reviewed in last December's power home PC list.

Beefy budget systems like these comfortably handle home computing tasks like Web surfing or tracking finances, as well as many home office assignments such as word processing and working with spreadsheets. Some budget systems can also run 3D games.

### **BEYOND MEGAHERTZ**

BUT IF YOU FEEL you must have the fastest PC you can afford, look beyond the CPU's clock speed to find it. No matter how zippy the processor, it can't do anything if the system does not feed it data fast enough.

You can often minimize the bottleneck by adding RAM. But sometimes CPU design itself causes additional bottlenecks.

Data travels to and from the processor via its front-side bus. Intel's Celeron processor currently moves data through the FSB at a leisurely 66 MHz, while its big brother, the Pentium-III, uses a 100- or 133-MHz FSB. In contrast, rival AMD's budget chip, the Duron, and its premium Athlon CPU both have a 200-MHz FSB. Every chip also has a tiny bit of fast memory called cache located near the CPU. Pentium III chips have the most cache memory, followed in order by Athlons, Durons, and Celerons. Differences in FSB and cache are the main reasons why a 700-MHz Celeron chip, for instance, is only about as fast as a Pentium III-600. (For more information on performance, see our November feature "Speed Secrets" at www.pcworld.com/ nov2000/speed\_secrets.)

So while the CPU's clock speed is the most prominently advertised feature of a PC, it doesn't always tell the whole performance story.

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# PHOTOGRAPH JOHN GREENLEIGH

### **MIDRANGE**

### [1] Dell Dimension 4100 PIII-800



WHAT'S HOT: At \$1579, this system is priced competitively with other Pentium III-800EB systems

from well-known manufacturers. The 4100's NVidia GeForce2 GTS graphics card with 32MB of DDR SDRAM provides smooth game play and fast frame ratesnear the front of the pack among similarly configured systems we've tested.

WHAT'S NOT: The 17-inch Dell M781 monitor looked sharp at 1024 by 768 resolution, but small fonts started to blur at 1280 by 1024. The location of the power supply makes reaching the back of any installed drive difficult. Dell did not protested. Games appeared smooth and colorful on the 19-inch monitor, and they sounded great on the four-channel Cambridge SoundWorks FPS2000 Digital sound system. A TV-out connector lets you pipe movies from the 16X DVD-ROM drive to your television.

WHAT'S NOT: DVD movies remained slightly dark, even after we adjusted the brightness. We had to bump up the monitor's refresh rate at high resolution to eliminate screen flicker.

WHAT ELSE: The Microsoft Natural Keyboard Pro comes with six buttons, including Back and Forward controls for your Web browser or CD-ROM drive. NuTrend provides a binder to store documentation and software, which includes Corel Word-Perfect Office 2000. The \$1739 system also carries an 8X/4X/32X CD-RW drive.

WHAT'S NOT: Game play was smooth and crisp, but frame-rate scores were slightly lower than the average for similar systems, indicating that the ABS may falter on high-powered games. Movies played on the system's DVD-ROM drive seemed quite dark, although they had true-to-life colors.

WHAT ELSE: A handy binder stores all documentation and software.

BEST USE: This system has the power to handle any home office task, but hardcore gamers and graphics buffs will want a better video card.

### [4] Gateway Performance 866

WHAT'S HOT: The Performance 866 posted a solid PC WorldBench 2000 score of 157, making it one of the fastest Pentium

> III-866 systems we've seen. It also supported smooth play and respectable frame-rate scores on all three of our gaming tests. Drives are mounted for quick access, and they snap into and out of drive bays easily, thanks to handy latches. The PC's midsize tower case has considerable expansion room, with four free bays (two externally accessible and two internal), plus three open PCI slots.

> WHAT'S NOT: We expected more extras for the \$1709 price-such as a CD-RW drive or other removable storage. We had to reset the monitor's refresh rate for comfortable viewing at 1024 by 768 resolution, and small text remained a bit blurry at that level.

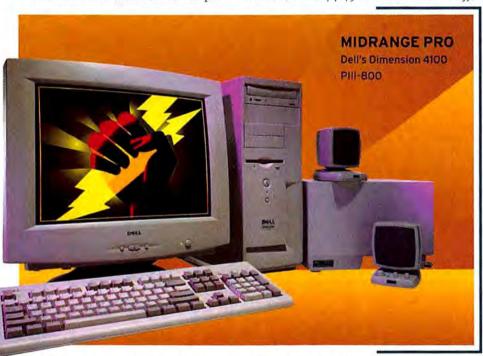
> WHAT ELSE: The Boston Acoustics Digital BA735 speakers and

subwoofer pumped out excellent sound. Gateway includes a well-illustrated user guide with the system.

**BEST USE:** The Performance 866 offers the demanding home office user a great foundation with the ability to upgrade.

### [5] HP Pavilion 87001

WHAT'S HOT: Colors looked rich and full on the Pavilion 8700I's 17-inch monitor, which rendered sharp text up to a resolution of 1024 by 768. The 8X/4X/32X CD-RW drive will store plenty of tunes, and the bundled ethernet card makes the



vide a setup poster with our test unit.

WHAT ELSE: The Altec Lansing ACS340 speakers and subwoofer deliver rich sound with respectable bass.

BEST USE: The 4100 PIII-800 is a fine all-around system for the family, for home office users who want lots of speed at a palatable price, or for gamers on a budget.

### [2] NuTrend Athlon Ultra 2

WHAT'S HOT: As its PC WorldBench 2000 score of 154 demonstrates, this Athlon-850-equipped PC is nearly as fast as some 1-GHz Pentium III systems we've

BEST USE: The Athlon Ultra 2 is good for a gamer on a budget or a demanding home office user.

### [3] ABS Multimedia System 2

WHAT'S HOT: The Multimedia System 2, with its 950-MHz Athlon processor, scored 160 on our PC WorldBench 2000 tests-reaching a better mark than most 1-GHz Athlon home systems we've tested. The Cambridge SoundWorks Digital sound system's two satellite speakers and first-rate subwoofer deliver full, welldefined sound to fill your home.

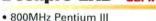


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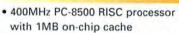
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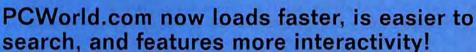
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system ready for broadband Internet access or home networking.

WHAT'S NOT: A PC WorldBench 2000 score of 145 marks this pricey PC as the slowest Pentium III-866 system we've tested. In addition, it delivered merely average frame-rate scores for its configuration on our graphics tests. Expansion is limited to one free PCI slot and one free. externally accessible drive bay.

WHAT ELSE: The Polk Audio speakers sound good for monitor-mounted units; but at this price, a sound system with a subwoofer would be more appropriate.

BEST USE: This solid family PC has the power to double as a home office system.

### BUDGET

#### [1] HP Pavilion XE763



WHAT'S HOT: For the bargain price of \$899, you get a complete Celeron-700 system and an HP

DeskJet 610 printer. Two tiny Polk Audio speakers provided surprisingly good sound for a system in this price range. Though a bit small, the 15-inch monitor produced rich colors and crisp text, even at a resolution of 1024 by 768.

WHAT'S NOT: With a sluggish PC WorldBench 2000 score of 104, the HP is the slowest system in our budget lineup. The integrated graphics chip set will not support 32-bit color, and therefore the Pavilion XE763 failed to run our Quake III and Microsoft Flight Simulator 2000 3D tests. It handled Rage Expendable fairly smoothly but yielded low frame-rate scores, meaning the game might stutter during very intensive play. The cramped interior hinders access to the two open PCI slots, the memory, and the CPU.

WHAT ELSE: This package is available only through Wal-Mart stores. A wellillustrated poster makes setup easy. Software includes Microsoft Works 2000.

BEST USE: The XE763 makes an ideal budget system for people who are not

# tips for choosing the right components

AVING TROUBLE finding a PC with the exact features you want at the right price? If so, why not customize? Just about every manufacturer has a build-to-order program that lets you create your own customized PC. Start by deciding how you plan to use your system: If you're mainly interested in Web surfing you needn't worry about having the fastest processor. Instead, you might want to spend your money on a bigger, brighter monitor and a network card for fast, broadband Internet access.

Extra RAM is almost always a good investment. Most systems in this review come with the optimal 128MB. Exceeding that amount may benefit only the most dedicated gamers and digital-video enthusiasts. But a few of the budget systems have only 64MB-a bit lean for a PC running Windows Me. Bumping the RAM up to 128MB can make a big difference, especially if you frequently run several applications at the same time.

For gamers, the most important component is a high-quality 3D AGP graphics card with plenty of video RAM (at least 32MB). Some budget systems, like our Best Buy HP Pavilion XE763, forgo the graphics card in favor of a graphics processor that is integrated into the motherboard and that draws on anywhere from 2MB to 11MB of system RAM. Most such systems don't support 32-bit color, popular in many 3D games. But you're not always stuck with limited graphics. Many motherboards use Intel's newest chip set, the 815E, which provides integrated graphics but also lets designers include an AGP slot.

#### A SOUND DECISION

MANUFACTURERS sometimes cut costs by integrating the sound subsystem into the motherboard as well. For the best audio performance, buy a system with a sound card that supports four-channel Surround Sound. (Look for an extra, fourth sound connector on the back of the



you're interested in does have integrated sound, check with the manufacturer to see if the motherboard will support a PCI sound card upgrade. And do your homework when selecting speakers. The models sent with many low-cost PCs-and even some included with midrange and power systems-just don't measure up. Some manufacturers don't even offer first-rate speakers-you may have to buy them separately.

Music and multimedia buffs will also need room to store their files, so make sure your system's hard drive is large enough. For example, high-fidelity MP3 music recordings consume at least 1MB per minute,

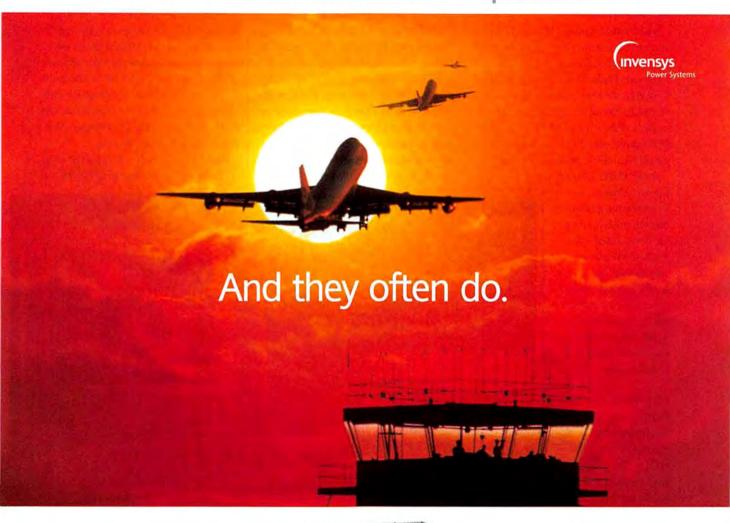
so you'll need 50MB to 60MB for just one CD's worth of music. In addition to a big hard drive, consider a CD-RW drive for extra storage and portability, and for data backups.

#### **ENJOY THE VIEW**

FINALLY, take care of your eyes. A good monitor isn't just for graphics pros or gaming. If you expect to log many hours in front of a home office system, spending a little extra on a topnotch monitor will make the experience far more pleasant and productive. If your PC manufacturer doesn't offer a good model, consider buying the monitor from another vendor.

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interested in games or demanding graphics applications. It is also a good choice for a low-cost second home PC.

#### [2] NuTrend Duron Power 2

WHAT'S HOT: The \$999 Duron Power 2's PC WorldBench 2000 score of 133 puts comparable Celeron-700-based systems to shame and delivers a level of performance you would expect from a Pentium III-650 unit. The two tiny Labtec speakers, along with a subwoofer, produced the best sound we've ever heard from a budget home system.

WHAT'S NOT: Quake III looked blotchy and unstable during our subjective gaming tests, although Rage Expendable and Microsoft Flight Simulator 2000 played smoothly. Detailed images and small text started to blur at a resolution of 1280 by 1024, and movies played on the DVD-ROM drive looked a bit dark-even after we adjusted the brightness settings.

WHAT ELSE: A large binder with clear

plastic sleeves neatly stores the bundled documentation and software, including Corel's Word-Perfect Office 2000.

BEST USE: The Duron Power 2's performance, monitor, and software make it an excellent home office system for those who are on a tight budget.

#### [3] Tiny Computers Millennium Home Power 800

WHAT'S HOT: You have to like an \$1199 system

that combines a Pentium III-800E processor, a 17-inch monitor, and a Lexmark ink jet printer. The package also includes an above-average software bundle, with Microsoft Works 2000, IBM ViaVoice, Corel Draw 8, and Microsoft Encarta 2000, among others.

WHAT'S NOT: "Home Power" is something of a misnomer. The system's PC WorldBench 2000 score of 134 does top our budget category, but an 800-MHz Pentium III machine ought to perform even better. And despite having an NVidia TNT2 M64 graphics board with 32MB of video RAM, the system turned in belowaverage frame rates on Microsoft Flight Simulator 2000 and Rage Expendable. It couldn't run Quake III at all.

WHAT ELSE: The system is easy to set up and comes with helpful documentation for new PC users.

BEST USE: The Millennium Home Power 800 should easily handle most home and home office tasks, though it is not equipped for fast-paced gaming.

#### [4] Polywell Poly 700KD

WHAT'S HOT: Equipped with a 700-MHz Duron processor, the \$1199 Poly 700KD posted an impressive score of 131 on our PC WorldBench 2000 tests. The system's midsize tower case provides plenty of room to grow: Five PCI slots, two externally accessible drive bays, and two internal bays are all open and easy to reach in the 700KD's spacious interior.

somewhat muddled bass tones, but otherwise sounded good enough.

BEST USE: This fast, inexpensive system should appeal to PC-savvy home office users. Adding a faster graphics card would also make it a worthwhile investment for gamers on a budget.

#### [5] Kaypro 4100

WHAT'S HOT: For a system equipped with a Pentium III-650 processor, the \$1029 Kaypro is a good deal.

WHAT'S NOT: A PC WorldBench 2000 score of 121 is respectable for our budget lineup, but the Kaypro 4100 is among the slowest Pentium III-650 systems we've tested. The integrated graphics chip set couldn't run our Quake III or Microsoft Flight Simulator 2000 test. Rage Expendable played smoothly, but posted very low frame-rate scores. The PC's bargain-basement sound system was weak.

WHAT ELSE: Small text appeared crisp on the 17-inch monitor at 1024 by 768 res-

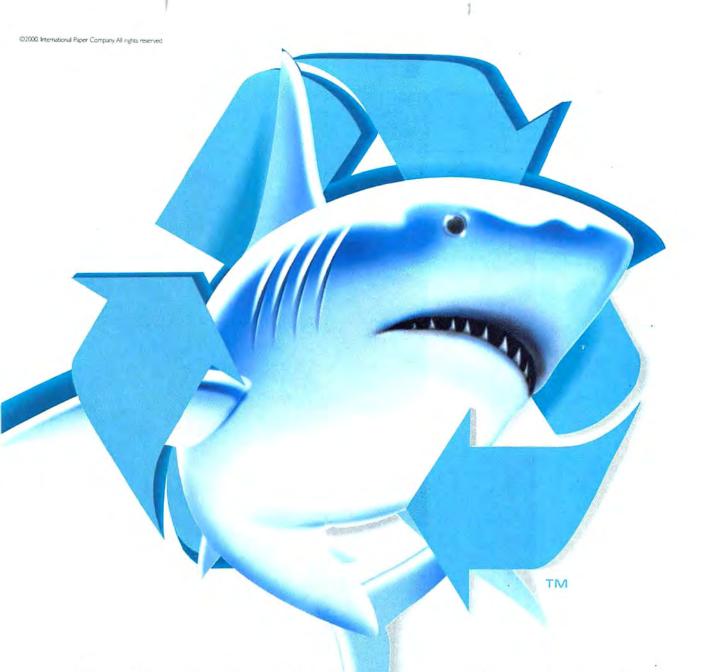


WHAT'S NOT: Game play on Quake III was choppy in high-color mode. The 17inch Optiquest Q71 monitor displayed images and text clearly at a resolution of 800 by 600, but it blurred small text at higher resolutions. When set at 1280 by 1024, the screen suffered from uncorrectable flicker. The system we tested came with limited documentation and no illustrated setup guide.

WHAT ELSE: The Cambridge PCWorks 100 speakers and subwoofer produced olution, but blurred at 1280 by 1024. Documentation consists of a clearly written setup poster and a thin user manual that covers just the basics of operating and maintaining the system. The only software of note is Microsoft Works 2000.

BEST USE: The Kaypro 4100 is a good choice for home office users looking to save a few dollars.

Contributing Editor Kirk Steers regularly covers home systems for PC World.



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Kodak DC4800 \$707



Fujifilm FinePix 4700 Zoom \$799



Casio QV-2300UXplus \$799



Canon PowerShot S20 \$699





Canon PowerShot S100 Digital Elph \$599

Whatever your budget, you'll get more megapixels for your money this year. We pick the best digital cameras above and below \$500.



IF YOU'RE THINKING of buying a digital camera, but high prices and quality concerns make you a little camera-shy,



here's some good news: Now is a great time to take

the plunge. Whether you plan to use a digital camera to post images to a Web site, share snapshots with friends and family, or record images of people,



HP PhotoSmart 618 \$599



Ricoh RDC-5300 \$599



Olympus D-490 Zoom \$499



Minolta Dimâge 2300 \$399



Epson PhotoPC 3000Z \$899 Best Buy



Olympus C-3030 Zoom \$999



Nikon Coolpix 990 \$999

property, or products for your business, there's a sub-\$1000 digital camera for you out there.

Though lens design, compression, and other elements affect output quality, manufacturers generally define a digital camera by its highest resolution—its total number of pixels. Normally, the greater the number of pixels, the better the picture. Last year, 2-megapixel cameras were

all the rage. This year, the same money buys a 3.3-megapixel camera, which sharpens resolution to 2048 by 1536, producing 8-by-10 prints virtually indistinguishable from a 35mm film camera's output. These relatively expensive digital cameras, priced at \$800 and up, also allow considerable manual control over aperture and shutter speed and come loaded with

extras such as the ability to take black-and-white photographs and to record short videos with sound. Meanwhile, some 2-megapixel cameras now cost less than \$500. Most units at this price, however, are point-and-shoot cameras best suited for capturing images for Web pages or e-mailing 4-by-6 or 5-by-7 prints, as well as making photographs for archiving.



Olympus D-360L \$299 Best Buy



Epson PhotoPC 650 \$260



Agfa EPhoto CL18 \$129

The recent advent of reasonably priced digital cameras with lens threads, external flash connections, and other professional features converted New York photographer Mark Greenberg to the technology. A photojournalist for 25 years, he now uses Olympus's \$999 C-3030 Zoom for about 10 percent of his work, including photographing Fortune 500 executives. The C-3030 lets him skip the steps of developing negatives and scanning them for editors who prefer digital images anyway. Two years ago he viewed consumer-level digital cameras as "a joke," but now foresees a day when about half of his work will be digital. "It has put the love of photography back in my life," he unabashedly declares.

#### Focusing on Digital

WHICH DIGITAL CAMERA is best for you? We tested 15 models priced at under \$1000 from Casio, Epson, Kodak, Min-



#### **Best Buys**

WITH EXTRA LONG battery life and round-theclock support, Epson's feature-packed, \$899

PhotoPC 3000Z (upper right) earns top honors among the high-end digital cameras (\$500 and up) reviewed here. Meanwhile, the \$299 Olympus D-360L wins our Best Buy recommendation in the low-end (under \$500) category, with a great price and more manual controls than other inexpensive point-and-shoot cameras we looked at.

olta, Nikon, Olympus, and other wellknown vendors to see what's available for consumers and small businesses. We evaluated both display (how photos looked on a monitor's screen) and print quality, and tested battery life. We also tried out

IGITAL CAMERA





each camera's features to see how easy they were to use. Our sub-\$500 Best Buy-the 1.3-megapixel, \$299 Olympus D-360L-packs lots of extras for its low price, including white-balance adjustment and panorama shooting. Our over-\$500

	\$500 AND OVER	Street price (9/29/00)	Overall rating '	Output	Ease of use	Battery life (shots) 2	Pixels (millions) <sup>3</sup> / maximum resolution	Bundled media/ capacity	Picture capacity a highest/lowest resolution
1	Epson PhotoPC 3000Z 800/463-7766 www.epson.com	\$899	88	Very good	Excellent	Excellent 299	3.3/2554 by 1902	CompactFlash/16MB	12/155
2	Kodak DC4800 800/235-6325 www.kodak.com	\$707	81	Very good	Adequate	Good 171	3.1/2160 by 1440	CompactFlash/16MB	7/21
3	HP PhotoSmart 618 800/752-0900 www.photosmart.com	\$599	81	Good	Good	Good 199	2.1/1600 by 1200	CompactFlash/16MB	15/165
4	Casio QV-2300UXplus 800/435-7732 www.casio.com	\$799	79	Good	Very good	Good 196	2.1/1600 by 1200	CompactFlash/16MB Microdrive/340MB	401/1587
5	Fujifilm FinePix 4700 Zoom 800/800-3854 www.fujifilm.com			Very good	Adequate 101	2.4/2400 by 1800	SmartMedia/16MB	8/45	
6	Ricoh RDC-5300 888/742-6410 www.ricohzone.com			2.3/1792 by 1200	SmartMedia/8MB	9/165			
7	Nikon Coolpix 990 800/645-6689 www.nikonusa.com	\$999	π	Good	Very good	Good 157	3.3/2048 by 1536	CompactFlash/16MB	1/80
8	Olympus C-3030 Zoom 888/553-4448 www.olympus.com	\$999	76	Good	Good	Adequate 137	3.3/2048 by 1536	SmartMedia/16MB	2/165
9	Canon PowerShot S100 Digital Elph 800/652-2666 www.powershot.com	\$599 75 Adequate Good Limited 70 2.1/1600 by 1200		2.1/1600 by 1200	CompactFlash/8MB	4/46			
10	Canon PowerShot S20 800/652-2666 www.powershot.com	\$699	74	Adequate	Good	Limited 65	3.3/2048 by 1536	CompactFlash/16MB Microdrive/340MB	6/176
	UNDER \$500								
1	Olympus D-360L 888/553-4448 www.olympus.com	\$299	79	Adequate	Good	Limited 44	1.3/1280 by 960	SmartMedia/8MB	2/122
2	Epson PhotoPC 650 800/463-7766 www.epson.com	\$260	75	Adequate	Very good	Adequate 142	1.1/1152 by 864	CompactFlash/8MB	30/88
3	Olympus D-490 Zoom 888/553-4448 www.olympus.com	\$499	74	Good	Good	Adequate 127	2.1/1600 by 1200	SmartMedia/8MB	1/82
4	Minolta Dimâge 2300 201/825-4000 www.minoltausa.com	\$399	71	Adequate	Adequate	Adequate 98	2.3/1792 by 1200	CompactFlash/8MB	1/178
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Agfa EPhoto CL18

888/281-2302 www.agfaus.ccm/cdi

Overall rating is based on price (30 percent), picture quality (20 percent), ease of use (15 percent), features (15 percent), battery life (10 percent), 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.

0.3/640 by 480

None/2MB (built in)

Very good

\$129

71

Poor

Adequate

Best Buy, Epson's \$899 PhotoPC 3000Z. offers the best combination of battery life. picture quality, and convenient operation of any camera in this review.

For all their complexity, digital cameras are usually easy to use, thanks in large part to their built-in LCD screens. But keeping a few things in mind will further simplify your transition from film cameras to digital photography.

For one thing, digital cameras inhale batteries. Some can drain a set of four AA alkalines in half an hour. So plan on investing in two sets of rechargeable batteries and a recharger if the camera you choose doesn't include them. The most popular type of rechargeable battery is nickel metal hydride, which lasts up to four times longer than ordinary alkalines. You can pick up a pack of four at a site like batterybarn.com for as little as \$16. Rechargers that work overnight cost less As digital cameras improve and more people discover their convenience, these devices will continue to change the face of photography.

than \$15, but a \$30 model can recharge four NiMH batteries in about 2 hours. Keep an extra, fully charged set of rechargeable batteries ready for your next field trip, and take along a set of standard alkaline AA or longer-lasting lithium AA batteries for emergency backup.

Currently, most cameras under \$1000 use either CompactFlash or SmartMedia memory cards to record images; the newest type of storage media, Sony's Memory Stick, is a distant third in popularity. If you plan on taking mostly highresolution photographs (which can top 10MB a shot), you might consider buying a camera (such as Casio's OV-2300UXplus) that can accept IBM's 340MB Microdrive disk. This miniature drive is slightly thicker than a regular CompactFlash card and can hold more than 400 high-resolution shots, compared with the dozen or so that a typical digital camera can record on a 16MB card. Some users have reported losing their work when they dropped or jarred their Microdrive-equipped cameras, however, so don't neglect to download your work to a PC regularly.

What's next in digital photography? It will be some time before 4-megapixel

F	FΔ	TU	R	ES	CO	M	PA	RI	50	N

Focal range (35mm equivalent)	Optical/ LCD viewfinder	Manual focus override	Manual exposure controls *	Photo output ports	Video/ audio recording	Camera weight (ounces) <sup>3</sup>	Batteries	Comments	
34-102mm	•/•	•	M, A, S	Serial, USB, video	•/•	16.1	4 AA	This easy-to-use camera has the longest battery life on the chart and allows control of settings such as flash, aperture, and shutter. It comes with Epson's 24/7 tech support.	
28-84mm	•/•	0	A, S	Serial, USB, video	0/0	11.4	1 rechargeable	Producing the best-fooking photos on the chart, the DC4800 is easy to use and has versatile exposure settings. For the price, it should record audio and video, however.	
34-105mm	•/•	•	M, A, S	IRDA, USB, video	0/0	10.6	4 4 4	HP includes some nifty features with the PhotoSmart 618, like the ability to group pictures into categories inside the camera, create watermarks, and add audio memos.	
41-123mm	0/•	•	M, A, S	Serial, USB, video	•/0	8.6	4 AA	With a 340MB Microdrive that holds more than 1500 photos, the 2300UX has the most storage of any camera on the chart by far. It also allows super-easy panorama shots.	
38-114mm	•/•	•	M	USB, video	0/0	9.0	2 AA	This small, stylish camera includes lots of flash, manual exposure, and zoom settings, but it doesn't have shutter or aperture control. Battery life is a bit short.	
38-114mm	•/•	•	None	Serial, USB, video	0/0	17	4 AA	Basic features and short support hours limit the RDC-5300. But camera includes a varied photo software bundle and easy-to-use settings.	
38-115mm	0/0	•	M, A, S	Serial, USB, video	•/0	16.1	4 AA	Though big and bulky, the Coolpix 990 includes features for photo enthusiasts, with exposure and focus control, a swivel lens, customized settings, and add-in lenses.	
32-96mm	0/0	•	M, A, S	Serial, USB, video	0/0	10.0	4.44	The C-3030's settings, though somewhat confusing, include versatile video reco which can be up to 3 minutes. Comes with a remote for hands-free playback.	
35-70mm	0/0	0	None	USB, video	0/0	6.7	1 rechargeable	The supersmall Digital Elph is quite limited, lacking aperture and shutter settings, video and audio. It includes a rechargeable battery pack, but it lasts only 70 shots.	
32-64mm	0/0	0	None	Serial, USB, video	0/0	9.5	1 rechargeable	Canon's S2O has more features and a friendlier design than the S100, but it's still basically a point-and-shoot with little manual control. Batteries last 65 shots.	
26	0/0		News	Serial,	0/0	9.1	4 AA	With digital zoom, panorama, and adjustable ISO and white balance, the D-360L is	
36mm	0/0		None	video	0,0	9.1	4 44	feature-rich, but its 44-shot battery life is far too brief.	
39mm	0/0	0	None	Serial, USB, video	0/0	14.7	4 AA	This inexpensive point-and-shoot is short on extras, but includes a cable and Compact- Flash card for uploading without the camera; strong 24/7 toll-free support.	
35-105mm	•/•	•	None	Serial, video	•/0	9.5	4 AA	Olympus's 2.1-megapixel camera has a reasonable battery life and some nice features— such as zoom, panorama, and video capabilities—but settings are confusing.	
38mm	0/0	0	None	USB, video	0/0	7.4	4 AA	At 2.3 megapixels, the Dimäge 2300 has the highest pixel count among sub-\$500 units. Supposedly long-lasting nickel metal hydride batteries yielded only 98 shots.	
45mm	•/0	0	None	USB, video	•/0	4.0	2 AA	The EPhoto CL18 is the least-inexpensive camera on the chart and it also works as a Wel camera, but features are very limited and it produces the worst-looking photos.	

Measured as number of shots taken before battery runs out.

May not match file size—some manufacturers don't use all the space on the screen; others interpolate using software.

Include full manual (M), aperture priority (A), and shutter priority (S).

<sup>1</sup> Includes standard batteries.

cameras break the \$1000 barrier, but you can expect to see some models next year priced at around \$1500. Olympus leads the way with its new \$1999, 4-megapixel Camedia E-10, which should be shipping by the time you read this. The first multifunction digital cameras are just around the corner, too: By the beginning of next year, Ricoh will sell a \$1500 combination digital camera and PDA called the RDCi700. This 3.3-megapixel camera will incorporate a 3.5-inch touch screen and a modem so you can use it to send and receive e-mails and faxes. Also next year, Polaroid plans to sell a hybrid digital/film camera called the C-211 that produces instant pictures on Polaroid film. It will retail for approximately \$800.

Until then, amateur and professional photographers alike will have plenty of choices among sub-\$1000 units. As digital cameras improve and as more people discover their convenience, count on these devices to continue changing the face of photography.

### Over \$500

1) Epson PhotoPC 3000Z



PRO: Longest battery life, secondbest pictures, easy to use, good manual controls, captures 25-

second video clips, includes audio.

CON: Weighs a bit over 1 pound, design somewhat clumsy, expensive.

Photography enthusiasts who don't need the extra muscle of a unit like the number seven Nikon Coolpix 990 should



consider the \$899 Epson PhotoPC 3000Z. This 3.3megapixel camera offers the best combination of picture quality and battery life in

our roundup. It's also one of the easiest cameras to operate. The 3000Z owes its approachability to seven unmarked "soft" LCD buttons, which change functions as you switch among automatic, manual, and program modes. Paired with their onscreen labels, the buttons elegantly handle everything from setting the aperture to adding a sound bite to a still shot-all without requiring you to leave the LCD's current image to enter a separate menu. The 3000Z isn't perfect, however. Some operations are awkward-moving around

The Kodak DC4800 turned out pictures with color accuracy and detail almost identical to shots we took with a traditional 35mm film camera.

zoomed shots, for example, requires you to use separate toggles to scan the picture vertically and horizontally. All things considered, though, Epson has done a marvelous job of making this powerful digital camera easy to use.

#### 2) Kodak DC4800

PRO: Best picture quality, long battery life, simple exposure tweaks.

CON: Fewer features for the price.

Unlike most similarly priced cameras, the \$707 Kodak DC4800 can't record video or audio, focus manually, display more than three thumbnails at a time, or

automatically shut itself off after a period of inactivity. But it does take terrific pho-



tographs. The DC4800 turned out the best point-and-shoot pictures of the 15 models we examined, with color accuracy and detail almost identical to shots we took with a 35mm film camera. When you want to set aperture priority quickly, the camera's three f-stops sit handily on the mode dial. Another dial adjusts exposure compensation. With these tools and the unit's smooth digital/optical 6X zoom, shutter control, and 3-frames-per-second continuous shooting, the DC4800 might suit undemanding action photographers.

#### HP PhotoSmart 618

PRO: Good-quality prints, sorting tools, remote can snap shutter up to 20 feet away, big software bundle, 199-shot battery life. CON: Pictures look worse on screen;

detailed manual on CD-ROM only.

Budget-minded photographers who need to sort shots in the field should check out the \$599, 2.1-megapixel Photo-Smart 618. Like the \$999 Nikon Coolpix 990, the PhotoSmart lets you create named folders inside the camera for grouping



pictures. But the PhotoSmart's colorful interface goes further: It can mark images with icons that identify them as work-, family-, or vacation-related shots; create watermarks of text or logos; and even attach 45-second-long audio memos. The PhotoSmart carries a 3X optical lens, has 2X digital zoom capability, and includes six picture-quality settings. It offers both aperture and shutter priorities and can take color or black-and-white photos. Attractive tabbed menus and versatile soft buttons make getting started easy. We found the play mode's status bars distracting, but we liked the camera's precapture info feature, which lets you preview picture settings in one tidy list before you snap the shutter.

#### 4) Casio QV-2300UXplus

PRO: 196-shot battery life, well-rounded feature set, generous storage capacity.

CON: Possible white-balance problem, slow start-up, no viewfinder.

Casio's new \$799, 2.1-megapixel camera tackles a wide variety of photo chores and makes each easy to accomplish. For pros, the camera provides full manual control. Novices can choose from 28 scene-based modes the camera will automatically set to, such as beach, forest, and cityscape, each illustrated with a sample photo to give an idea of how the scene will look. Realtors and others who need wideangle pictures will love the Casio's panora-

ma mode: To help you line up the next shot, the Casio overlays a transparency of the



previous picture's right edge; when you're done, the stitched image crawls across the LCD. Pretty slick. The unit can record in black-and-white, capture video, and even let you take self-portraits, thanks to its swivel lens. Instead of using a mode dial to set options, you rely on button shortcuts or animated icons like a winking crescent moon and twinkling stars for the preset night scene, say. The included 340MB IBM Microdrive, which holds close to 1600 low-resolution shots, helps to cut way down on memory-card



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OmniBeok

swaps. Except when we had to manually focus outdoors, we had no problem relying solely on the LCD. But with a 5-second start-up time and no continuous shooting mode, this model is ill-equipped to capture action. The Casio also added a greenish cast to some indoor shots before brightening a bit; this seemed to indicate a possible white balance malfunction in our test unit, but our Casio contact said that was how the white balance worked.

#### 5) Fujifilm FinePix 4700 Zoom

PRO: Good pictures, stylish design, button shortcuts, lots of extras.

CON: No shutter or aperture control, 101shot battery life, pop-up flash.

Shiny as a sterling-silver cigarette case,



the FinePix 4700 Zoom should please shutterbugs looking for an eye-catching camera. The FinePix simulates a bubbly personality-

its big, round status panel flashes a cheery "Hello!" when you power up and "Bye!" when you shut down-but this \$799 camera is no airhead. The 2.4-mega-

#### From the Terrible to the Terrific

AS DIGITAL CAMERAS DROP IN PRICE, it's becoming easier to get good picture quality from an inexpensive camera. A gap still exists, however, so prepare to pay more for great shots. The cameras we tested for this review ranged in print quality from blurry and oversaturated to crisp and realistic. Many did the job well, and some rivaled the 35mm camera we used as a control, the Leica Minilux Zoom.













































HOW WE TEST: The photo of the mannequin was shot at 640 by 480 by 16-bit color, or the lowest resolution the camera had. The photo of the still life was shot at the highest resolution each camera offered, which varied from camera to camera. We rated all on-screen and print photographs on color and detail, using a five-point scoring system (Excellent, Very good, Good, Adequate, Poor).



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pixel FinePix delivered some of the best high-resolution 8-by-10 pictures in our tests, and the camera comes loaded with impressive features. You can record video and sound, inspect the most minute details in high-resolution pictures by enlarging them optically and digitally up to 15 times, and ensure high-quality action photographs with exposure-bracketed continuous shooting. The FinePix's batteries are somewhat short-lived, however, holding out for only 101 shots.

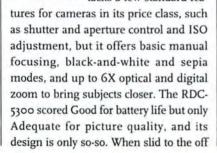
#### 6) Ricoh RDC-5300

PRO: Biggest software bundle here. CON: No shutter or aperture priority, ISO

setting not adjustable.

Though easy to learn to use, the \$500. 2.3-megapixel Ricoh RDC-5300 does not stand out in any one area-except for the

six photo-manipulation software packages that come bundled with it. It lacks a few standard fea-



position, the Ricoh's power switch simultaneously slides a protective cover over the LCD. We liked this arrangement until we had to wake the camera from sleep mode by turning it off and then on several times. You'll have to schlep to the menus for some simple tasks (picking the thumbnail view, for instance). But setting picture quality-a pain on some cameras-is a breeze on the Ricoh.

#### 7) Nikon Coolpix 990

PRO: Largest set of tools for serious photographers, yet easy to learn.

CON: Bulky and heavy.

You won't find any animated icons, chatty status panels, or preset scene modes in the \$999 Nikon Coolpix 990.

This matte-black, 3.3-megapixel, 1pound camera is all business. With



quiet, smooth operation and the widest array of tools here for setting exposure and focus, capturing action, and reviewing picture settings, it should please serious photographers seeking a good, professional-quality digital camera for under \$1000. In addition to providing complete control over exposure and focus, the Coolpix 990 offers 16 different picturequality settings, includes a swivel lens, and holds 40 seconds of video. Its

smooth, one-button zoom feature enlarges scenes up to 3 times optically and another 4 times digitally. The camera can save three sets of customized settings to suit different users or situations, and it works with various add-in lenses, including fish-eye. The Coolpix 990 turned in less-than-perfect picture quality scores in our tests, due mainly to some loss of detail at lower resolutions. But at its top resolution of 2048 by 1536, it produced photos that rivaled the output of a 35mm camera. Battery life with AA alkalines was reasonably long, lasting for 157 shots.

#### 8) Olympus C-3030 Zoom

PRO: Compact, handsome design; includes remote; records video and sound.

CON: Confusing picture-quality settings.

In picture quality, the \$999, 3.3megapixel C-3030 did well, with mostly accurate colors and good detail. Its batteries have enough life for 137 shots on a charge. Neither as full-featured as the

Coolpix 990 nor as easy to use as the Epson 3000Z, the C-3030 might best suit digital



presenters. It can record 3 minutes of video in color, black-and-white, or sepia tones-with audio-and can attach 4-second sound bites to stills. With the camera hooked up to a PC or a TV, you can use the bundled remote to play back your work for an audience. Overall, the Olympus C-3030 Zoom is highly capable and easy to master. Aperture, shutter, and focus can be set in a jiffy. In both capture and playback modes, a single lever zooms the picture-a great convenience. Your only headache will come when you try to decipher Olympus's obtuse labels and menus for picture-quality settings.

#### 9) Canon PowerShot S100 Digital Elph

PRO: Fits in a shirt pocket.

CON: 70-shot battery life, oversaturated colors, limited features for a \$600 camera.

The tiny PowerShot S100 Digital Elph may be the world's smallest 2.1-megapixel camera to pack a zoom

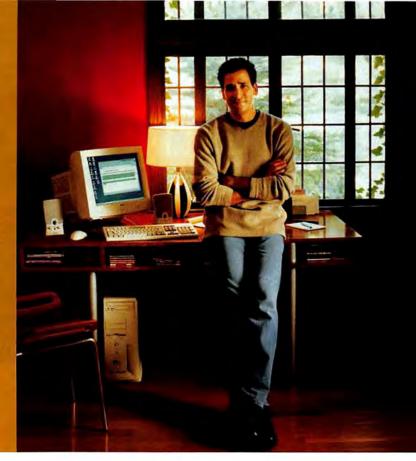
lens. But size isn't everything. If picture quality is

more important to you than portability, you're probably better off opting for a



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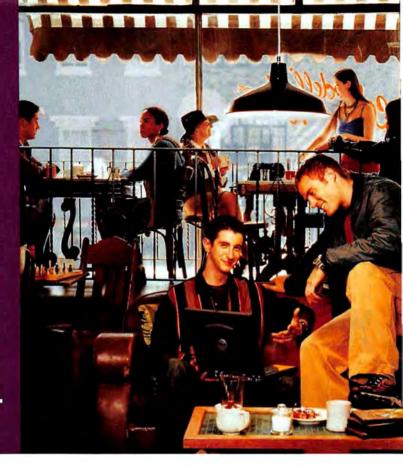
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slightly larger, more capable camera, such as the HP PhotoSmart 618, which does more for the same \$599 price. About the size of a deck of cards, Canon's Elph has a plain stainless steel case with raised bumps on the back for improved gripping. Primarily a point-and-shoot camera, it allows no manual control over aperture, shutter, focus, or ISO setting. And with a lens limited to 2X optical zoom, the Elph forces you to rely heavily on less-desirable digital zoom to bring objects up to eight times closer. In its favor, the Elph can take black-and-white pictures and panoramic shots for subsequent stitching together via software. Though it's generally easy to use, some settings are a bit awkward. Five buttons crammed beneath the LCD juggle most of the camera's settings within a set of bare-bones menus. To choose a picture-quality setting, you must drill down through menu layers, but with practice you can get there quickly. Other downsides: Although detailed, the Elph's photos displayed oversaturated color, and at a capacity of just 70 shots, the Elph's battery life is quite brief.

#### Canon PowerShot S20

PRO: Versatile panorama mode.

CON: Low-resolution prints look blurred. battery lasts for only 65 shots.

The PowerShot S20 is a fuller-featured sibling of Canon's tiny, 2.1-megapixel Digital Elph (see above). The 3.3-megapixel



S20 allows you to set options using more buttons and dials than the Elph does, and the color-

ful menus are friendlier and less cramped. The nicest addition is an expanded panoramic feature for stitching shots in any direction, including up and down, which aids in photographing a tall building, for instance. Unfortunately, the S20 shares the Elph's surprising lack of manual control, with no aperture priority, shutter priority, or manual focus mode. This makes the \$699 PowerShot S20, which costs \$100 more than the Elph, a pretty expensive point-and-shoot camera. And its 2X optical lens means that you must use digital zoom if you want to enlarge objects up to eight times. The S20's main selling point is its petite size, but it's no smaller than Fujifilm's \$799

FinePix 4700 Zoom, a model that does a lot more at just a slightly higher price.

### Under \$500

1) Olympus D-360L



PRO: Generous extras for the money, easy to learn.

CON: Shortest battery life, slow

downloads over serial connection, confusing picture-quality settings.

The 1.3-megapixel Olympus D-36oL includes a lot of perks for a \$299 pointand-shoot digital camera. For example, you can digitally zoom in twice as close to



a subject, position the lens 4 inches away from the subject in macro mode, adjust

the ISO and white balance, under- or overexpose shots, take panoramic pictures, and shoot up to two frames per secondall rare options in a \$300 camera. Snapshots could have been crisper, but the D-36oL's colors were mostly on target, and with only five dual-purpose buttons handling most of the chores, learning to use the D-36oL is easy. Reviewing shots takes too long, however, and the D-36oL uses the same confusing naming scheme for picture-quality settings-HQ, SHQ, SQ-HIGH, and so on-as other Olympus cameras. Another downside: The D-36oL chug-a-lugged its four alkaline batteries, which lasted for only 44 shots-barely enough for pictures of the kids opening their presents on Christmas morning.

#### 2) Epson PhotoPC 650

PRO: Inexpensive, includes Lexar Media's JumpShot cable.

CON: Weighs almost a pound; pictures are fuzzy, with slightly inaccurate colors.

At \$260, Epson's 1.1-megapixel PhotoPC 650 is affordable, and it's easy to use. The camera took a reasonable 142



shots on four alkaline batteries, and it includes a USB connection. Alter-

natively, you can use the bundled Jump-Shot-a simple USB cable with a CompactFlash card slot on the end for fast, camera-free picture uploads to your PC. Epson offers around-the-clock tech support with its cameras as well. Still, the

PhotoPC 650 falls a bit short of our Best Buy, the Olympus D-36oL. Both cameras produced slightly out-of-focus 4-by-6 photos, but the D-36oL's pictures showed truer colors. Most of the PhotoPC's photos contained at least one or two off-base hues-it turned our model's navy-blue skirt purple, for instance. The PhotoPC 650 is strictly a point-and-shoot camera: You can't tweak the exposure or zoom in on your subjects without adding an optional lens. The unit is also chunkier and noisier than most digital cameras.

#### 3) Olympus D-490 Zoom

PRO: Excellent picture quality for the money, reasonable 127-shot battery life. CON: Confusing picture-quality settings, menacing lens shield, slow downloads over serial connection.

Olympus's 2.1-megapixel Olympus D-490 Zoom is an easy-to-learn, \$499 point-and-shoot camera that equaled the \$799 Fujifilm FinePix 4700 Zoom in picture quality and nearly matched the \$999 Olympus C-3030 Zoom in battery life.

The D-490 Zoom comes equipped with a 3X optical zoom lens, augmented by 2.5X digital zoom. You



can take panoramic shots and capture action with 1.3-fps sequential shooting or with 6o-second videos. So what's to complain about? The product's labels for picture-quality settings are a bit confusing, and the manual will stump novices in some places (for example, when it refers to the camera's LCD as a "status panel" and to playback as a "shooting mode"). But what this camera needs most is a safety stop for the lens shield: It's too easy to slide this shield into the lens, knocking into it before it has had a chance to recede.

#### 4) Minolta Dimâge 2300

PRO: Relatively inexpensive for the level of resolution it offers.

CON: Below-average picture quality, 98-shot battery life, unwieldy operation.

Though reasonably priced for a 2.3-



megapixel camera, the \$399 Minolta Dimâge 2300 has its ups and downs. On the upside,

it offers such higher-end features as 2X digital zoom, exposure compensation, and one additional ISO setting. On the downside, the Dimâge blurred finer details, skewed dark colors in our test shots, and didn't operate for very long on one charge of its nickel metal hydride batteries-though that was still twice as many shots as our number one pick. The Dimâge also suffers from a somewhat clumsy design. Most digital cameras have their memory card slots on the side, so that adding a new card requires little movement of the camera. But the Dimage's card slot is located on the bottom of the camera along with the batteries, making card changing clumsy and needlessly difficult. In addition, most settings require annoying extra steps. For instance, instead of setting macro and flash options by cycling through them in the status panel, you must resort to a separate menu in the camera's screen.

#### 5) Agfa EPhoto CL18

PRO: Doubles as a Webcam, dirt cheap, long battery life, compact.

CON: Worst pictures, few frills.

It's a digital camera. It's a Webcam. The dual-mode Agfa EPhoto CL18 is both and costs only \$129. Connected to your PC, the 4-ounce CL18 can capture video clips

and send live images over the Net. In hand, it's a simple point-and-shoot digital camera, small and



light enough to slip into a shirt pocket. Sounds tempting, but we recommend spending more money and buying a better camera. The EPhoto blurred 4-by-6 snapshots and gave them a strange metallic cast. With settable options limited to flash and a self-timer, the unit is easy to master, but it holds only 32 pictures and lacks a display LCD, so you can't review shots in the field. This hybrid does have great battery life. With no LCD to drain them, its two AA alkaline batteries lasted through 256 shots on a single charge, making the EPhoto second only to the \$899 Epson PhotoPC 3000Z.

Carla Thornton is a contributing editor, and Lisa Cekan is a staff editor, for PC World. Testing was conducted by the PC World Test Center.

#### Develop a Virtual Portfolio

NOW THAT YOU'VE FOUND the perfect digital camera for your home or business, you need a way to manage those dozens of must-keep photos and share them with friends and colleagues. Luckily, you have a lot of software options to help you do so, ranging from freebies to packages costing hundreds of dollars. In addition, some cameras we looked at come bundled with photo management software. How to choose? Here is a sampling of what's available.

For basic photo management and photo sharing, Adobe Active-Share is a free download from Adobe's Web site at www. activeshare.com. Features include image cropping, red-eye reduction, and a quick-fix button to automatically reduce or increase contrast in photos. You can e-mail photos to friends directly from the program or use ECircles, Adobe's photo-sharing Web site, to post them to the Web for others to view. ActiveShare also allows you to create albums, search for particular pictures, and compose captions. Adobe provides sample photos for you to practice on, so you can try out features before applying them to your own shots.



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CANTO OFFERS true media management with Cumulus 5.

For \$50 (or \$70 for a CD-ROM version), Sierra Imaging's Image Expert 2000 (www.sierraimaging.com) offers the same features as ActiveShare and adds several more. Besides a guick-fix button, the program supplies manual brightness and contrast controls, a utility for stitching together multiple images to create a panoramic scene, and tips on how to take a panoramic picture. Like ActiveShare, Image Expert has features for sharing photos with friends, whether through e-mail or by posting them to the Web. Finally, you can string your photos together into a slide show and create a movie using a downloadable plug-in.

For true control, Cumulus 5 from Canto (www.canto.com) is a complete media management tool with the look and feel of a Word or an Excel document. Priced at \$100, Cumulus 5 lets you store and manage your files-whether audio, video, applications, text, or just about anything else. In fact, you could catalog your entire hard drive and simply work off of Cumulus. You can see thumbnails of each file in a Windows Explorer-type window, including descriptions of what kind of file it is and where it resides on your system. From there, you can open the file, move it, copy it, rename it, create a keyword for it, and turn it into an HTML file for posting to the Web.

-Lisa Cekan

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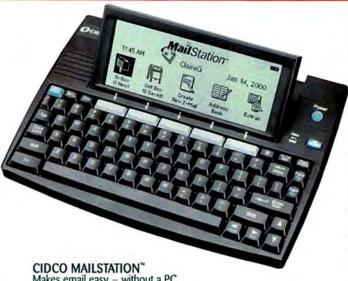
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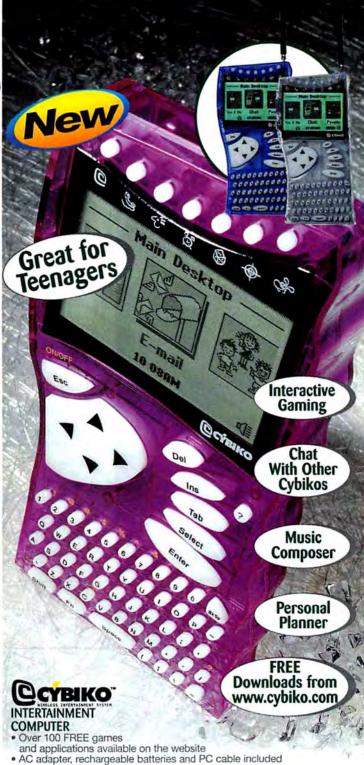
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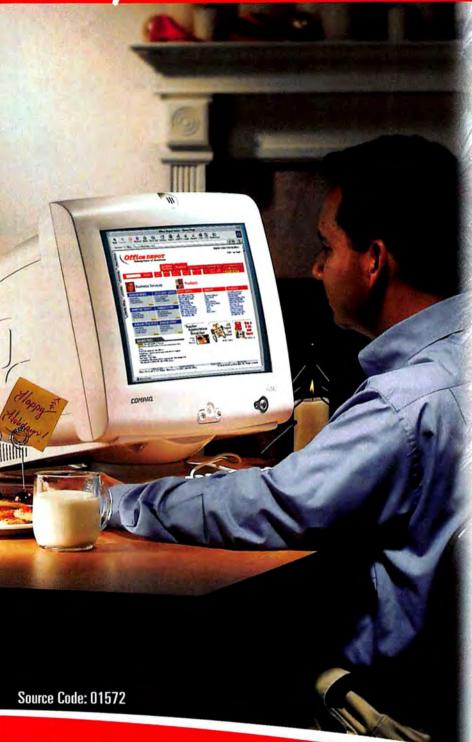
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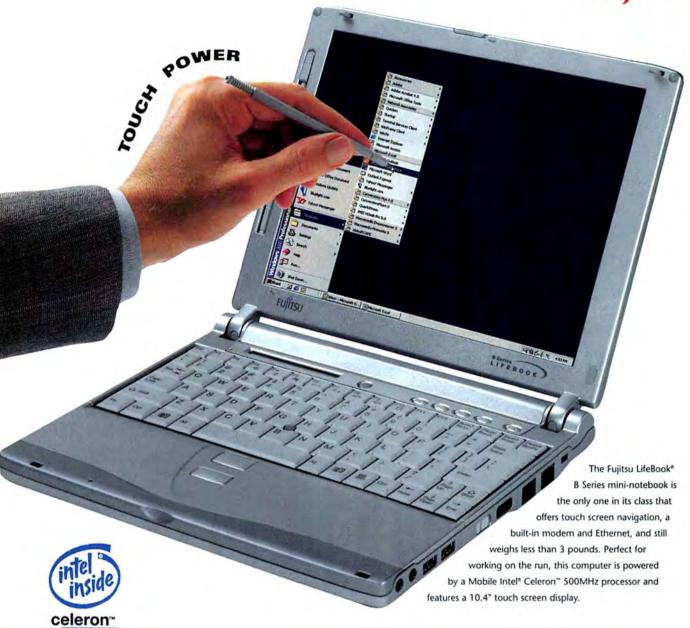
# GAMES GROUP-PS

Our editors pick the hottest titles around, from quiz shows to fantasy games, just in time for the holiday season.

BY THE STAFF OF PC WORLD

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# BUYING GUIDE

THE MOST INTERACTIVE games in the world don't require a PC. When you play a board game or cards, you take turns with friends. You win. You lose.

You chat. Maybe you even cheat. In contrast, computer gaming has gained a reputation for being a solitary, somewhat antisocial indulgence. But that's changing. So we at PC World took a breather from our busy workdays to try out some of the latest PC games and found ourselves glued to our screens-sometimes alone, but often in groups.

We delved into games in a variety of categories-action, puzzle, strategy, and sports, among others-and found a dozen that make great gifts for deserving folks of all types (including, of course, yourself). Some are

simple quizzes; others, including various action and racing games, offer heightened realism and special effects that take advantage of the latest 3D technologies. Several titles allow multiple players to compete, either in person or over the Internet.

Think you need an ultrapotent PC to play great games? Well, you really don't. The majority of these packages can run on any system carrying at least a 266-MHz Pentium II processor, 32MB of RAM, a two-year-old or younger graphics card, and Windows 95 or later. Most are also notebookfriendly-good news for laptop-toting road warriors who could use a break from spreadsheets and presentations.

If you're looking for a truly immersive gaming experience, some upgrades may be in order. For super-realistic visuals, invest in a desktop PC with a solid 3D graphics card (see Top 10 Graphics Boards on page 243); a high-grade sound card like Creative Labs' Sound Blaster Live X-Gamer; stereo speakers like the ProMedia V.2-400 THX set from Klipsch; and-if the game you play supports it-a joystick from a vendor such as Logitech, Microsoft, or Thrustmaster. For online gaming, a fast, always-on cable modem or DSL connection works wonders.

One other thing: Nearly all the games here are sequels, spin-offs, or add-ons. We didn't plan it that way, but good new gaming ideas are in short supply. So while you await the next Tetris or Myst, keep yourself entertained with these amusing offshoots of proven winners. Let's play!

GET MEDIEVAL: Microsoft's Age of Empires II: The Conquerors lets strategy game fans go a-conquering in the name of five new civilizations.

### FOR CONTROL FREAKS

### Age of Empires II: The Conquerors Expansion

### WARFARING FUN FOR YOUR INNER ATTILA

WITH AGE of Empires II: The Conquerors, Microsoft revitalizes its real-time strategy game, challenging players to build an empire out of a budding medieval civilization. The original version had exceptional multiplayer features and was a longtime best-seller, so the expansion pack is not unexpected. (You need the original game to play Age of Empires II.) This update adds five new civilizations for players to control (including Aztec and Mayan) and lots of new troop units and technologies. Routine tasks like replanting farms are now automated, and all units

gain an intelligence upgrade. Unfortunately, the original game's delicate gameplay balance has been upset slightly by a powerful new unit that gives one civilization a bit of an edge. Even so, fans of the earlier game are sure to appreciate The Conquerors Expansion. And if you're a game player who's still stuck in the pre-Age of Empires dark ages, this add-on will give you one more reason to start laying your foundation for world domination.

· Publisher: Microsoft; Developer: Ensemble Studios: \$30: 888/218-5617: www.microsoft.com/ -Eric Dahl games/conquerors

### **Lemmings Revolution**

### THE LITTLE LEMMINGS ARE BACK-IN 3D

THE LAST NEW PC puzzle game I loved was Microsoft's Pandora's Box, an assort-

> ment of 2D and 3D jigsaw puzzles created over a year ago by Alexey Pajitnov of Tetris fame. Of the new ones I tested, the only keeper was Lemmings Rev-

olution, another sequel to a PC classic. Like its Lemmings predecessors, Revolution lets you give your hordes of automaton-like creatures the strategic skills they need to escape a mass march to extinction. Veteran Lemmings fans will recognize such talents as climbing and digging, but I don't remember ever seeing the Jesus Lemmings before (they can walk on water). This single-player game has been updated visually, too, so now you need a PC with decent 3D graphics capability. Although they weren't ready at press time, two other forthcoming 3D puzzlers should also find enthusiastic audiences: Mattel's RealMyst 3D Interactive Edition, an updated version of the surreal 1990s blockbuster Myst; and the 3D version of LucasArts' Escape from Monkey Island.

· Publisher: Take-Two Interactive; Developer: Psygnosis; \$20; 800/211-6504; www.talonsoft. -Yardena Arar

### Return of the Incredible Machine: Contraptions

### THE FAMILY THAT TINKERS TOGETHER ....

THERE'S SOMETHING fundamentally and deeply satisfying about building things, whether you're producing a flashy, multipurpose contraption or a simple

one-trick doohickey. Return of the Incredible Machine: Contraptions, a follow-up to the original Incredible Machine CD-ROM game, tests your ability to construct ingenious gizmos out of various components-ranging from ropes to conveyor belts to mouse motorsso that you can achieve a trickierthan-it-sounds goal such as dropping a ball into a basket or lighting fireworks. Either one or two players can work at a single computer, solving puzzles that range from reasonably simple to ultra-challenging; the game's varying levels of difficulty make it suitable for

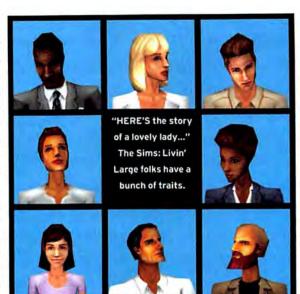
kids and grown-ups alike. Inspired by the fanciful creations of cartoonist Rube Goldberg, this inventive puzzler does a great job of combining humor, entertaining background music, and a bright, cartoonlike look.

· Publisher: Sierra; Developer: Dynamix; \$30; 800/757-7707; www.nowthisisfun.com/ contraptions -Grace Aquino

### RollerCoaster Tycoon: Loopy Landscapes **Expansion Pack**

### A THEME PARK OF YOUR OWN

ONE OF LAST year's greatest hits, Roller-Coaster Tycoon, has just spawned another expansion pack: Loopy Landscapes. Corkscrew Follies, an earlier expansion package, comes bundled in the Loopy Landscapes box. (Investment note: You must have RollerCoaster Tycoon to play either of these add-ons.) Loopy Landscapes



offers quirky new roller-coaster rides (like the jet ski), park shops (including T-shirt and doughnut stands), and park themes (such as urban and winter landscapes). You can play in 30 different settings, including the arctic, the desert, medieval castles, and even actual English amusement parks. So hop aboard, remain seated, and secure your personal belongings.

· Publisher: Hasbro Interactive; Developer: Chris Sawyer/MicroProse; \$30; 800/400-1352; www. hasbrointeractive.com -GA

### The Sims: Livin' Large Expansion Pack

PLAYING GOD JUST GOT A LITTLE WEIRDER

SATISFY YOUR urge to meddle (without calling up your relatives) and your appetite for the absurd (without reading the newspaper) by spending some quality time with Livin' Large, Maxis's latest expansion pack to supplement its popular singleplayer game, The Sims. As in the original game (which you must have in order to play this version), your task is to control the everyday lives of your Sims citizens-only this time the scenarios have grown even kookier, from alien abductions to roach infestations. Among the strange new objects are such potentially havoc-inducing set pieces as a personalityaltering chemistry set and an exploding garden gnome. Strike a blow for nurture over nature by selecting any of five new career tracks and 50 new job options designed to help you prepare your

character for life as a hard-core hacker, an eagle-eyed journalist, or many other plum vocations. You can also choose from an array of offbeat new architectural settings, including a cheesy Vegas theme and an appropriately psychedelic 1960s look. All in all, this is one virtual dollhouse you don't want to miss.

· Publisher: Electronic Arts; Developer: Maxis; \$30; 877/324-2637; www.thesims.com -GA

### RACE FOR THE GOLD

### Links 2001

### YOUR CHANCE TO PUTT WITH THE PROS

SHORT OF AN enormously expensive road trip or a full-fledged holodeck, Microsoft's Links 2001 is as close as you can get to playing golf at St. Andrews, Whistler, and Westfield. This latest version of

### POCKET-SIZE PLAY: GAMES FOR THE PALM

SO YOU'RE BUYING someone a practical gift-a Palm-based organizer. Why not spice it up with some great (and free) downloadable games specially adapted for Palm play? And while you're at it, get a few of these nuggets for yourself. Thousands of Palm puzzle, action, text, and even board games are available. Some are freeware; others are inexpensive shareware. Then, next time you're waiting for a train, you can entertain yourself with unauthorized but accurate clones of such classics as Frogger (its PDA knockoff is called Froggy), PacMan, Pong, and Tron. Or play a game of backgammon, chess, or checkers



against another Palm gamer via infrared link. If you like to play cards, check out SmallWare's Solitaire 2.1.8 pack, which includes three free card games: Klondike Deal 3, Demon, and Baker's Game. And don't miss Niggle 1.3 (think Scrabble), which lets you play against four other players via infrared. -Alexandra Krasne



To download these PDA games, go to www.pcworld.com/downloads/ online palm. For PC World's reviews of

other PC and Palm games, visit www.pcworld. com/dec2000/games.

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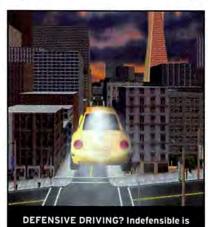
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Links permits multiple players to compete head-to-head (online or through a LAN), and it delivers the best graphics I've ever seen in a golf game-six challenging world-class courses are rendered in photorealistic detail. Game play features realistic ball physics and accurate greens based on GPS surveys. You can tap any of 15 golfers, including Arnold Palmer and Annika Sorenstam, to join you for a round, and individual players can tweak the game's club distances to reflect their own. Links 2001 also provides a fine course designer so you can re-create your favorite home course or construct the most outlandish layout imaginable. If your tastes run more to contact sports, EA Sports' Madden NFL 2001 has you covered.

· Publisher: Microsoft; Developer: Microsoft; \$55; 888/218-5617; www.microsoft.com/games/ links200 -ED



### Midtown Madness 2

### DRIVER'S MISEDUCATION AT ITS FINEST

more like it. Zoom through London and

San Francisco in Midtown Madness 2.

DOES THE HORROR of your daily rushhour commute leave you daydreaming about a series of vengeful motoring acts that AAA would never approve of: blindsiding cars that cut you off and then evading the police by speeding down the nearest interstate in the wrong direction? Grab a copy of Microsoft's Midtown Madness 2, and you can run amok without damaging your driving record. This sequel improves on its predecessor by offering several new vehicles-including cars, trucks, buses, and even a light attack vehicle-and two world-famous cities rendered in wonderful detail to cruise, race, or crash your way through. Midtown Mad-



FORE! LINKS 2001 lets you play a few photo-realistic holes whenever you want-no goofy outfit required.

ness 2 meticulously re-creates San Francisco and London, from the signature landmarks and neighborhoods to the hapless pedestrians scrambling out of your way. You can battle up to seven other irresponsible motorists over a LAN or Internet connection (via MSN Gaming Zone). Oh, a word of advice on the locals: This ain't Carmageddon, so don't waste your time trying to run over any gawking tourists-the worst you can do is send them diving out of your path.

· Publisher: Microsoft; Developer: Angel Studios; \$45; 888/218-5617; www.microsoft.com/games/ midtown2 -Matt Halloran

### FULL-BLOWN FAN

### Baldur's Gate II: Shadows of Amn

WIZARDS DO THE DARNEDEST THINGS

THIS WORTHY sequel to the highly acclaimed Baldur's Gate drops you right into the middle of an epic adventure story occurring in one of the most beautiful and detailed fantasy worlds this side of a Tolkien novel. As the action begins, your character is trapped in a dungeon, imprisoned by a powerful wizard. With the help of some friends from the original Baldur's Gate, you must fight your way out

and embark on stirring adventures. Up to six players can compete via a LAN, Internet, modem, or serial connection. The lovely artwork, stunning spell effects, and gripping story of BGII are sure to keep role-playing game fans glued to their computer screen for days. You do, however, need a powerful PC to play the game

in all its glory. Even my high-end Athlon-800 machine packed with 128MB of RAM choked on some of the battles. If Baldur's Gate II leaves you wanting more, Interplay's Icewind Dale and Blizzard's Diablo II are both good for hours of additional role-playing action.

· Publisher: Interplay; Developer: Bioware; \$50; 800/468-3775; www.interplay.com -ED

### **EverQuest: The Ruins of Kunark**

WANNA MEET SOME TROLLS ONLINE?

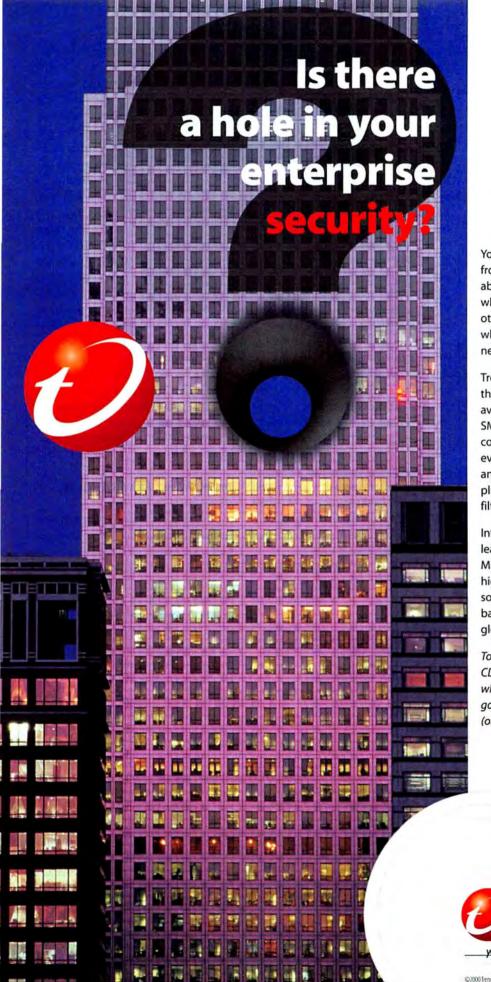
ONE ONLINE game stands out from the crowd and continues to lure people in: EverQuest. Set in a fantasy world called Norrath, this game enjoys a huge cult following. Players design characters of various legendary races (such as dwarves, elves, and trolls) and types (magicians, warriors, and so on), and then send them roaming throughout the land to slay creatures and fulfill quests. The characters you create can also join guilds-a tactic that enables them to explore Norrath's more

dangerous areas as part of a

group. To play Ever-Quest online with other adventurers, you must fork over approximately \$26 every three months, which poses a bit of a burden-especially if you are purchasing the CD-ROM (\$40) as the gift and expecting the lucky recipient to come up with the recurring access fee. Its high price notwithstanding, the game continues to enjoy



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skyrocketing popularity. But EverQuest's success has not gone unnoticed by other game developers: It faces strong competition from such forthcoming rivals as Anarchy Online and Origin; Anarchy Online should be out by the time you read this, and Origin is slated to be released in March. (To find out more about the addictive world of Internet gaming, see "How It Works: Online Gaming," www.pcworld. com/how\_it\_works/net\_gaming.)

· Publisher: Sony Computer Entertainment America: Developer: Verant: \$40; www.station. sony.com/everquest -Richard Baguley

### Tribes 2

### LIKE CHESS WITH AN ADRENALINE RUSH

TRIBES 2-a follow-up to the 1998 hit, Starsiege: Tribes-delivers the most immersive first-person experience currently available in an action game. Set in a bleak future in which a fractured humanity has raced to the stars and battled for control over livable planets, Tribes 2 builds on the original game with detailed landscapes, new types of vehicles and weapons, and a

AN ONLINE **DOODLE DANDY** 



GAMING RANKS as one of the most popular of online activities. A quick search for online games yields a never-ending list of card, puzzle, simulation, and word games,

among other types. Some are complete yawners, but others are thoroughly engaging, including my favorite, ISketch. Mimicking the boardgame classic Pictionary, ISketch challenges players to draw stick-figure graphics on a virtual white board using simple draw and paint tools. Meanwhile, online participants take turns trying to figure out what the artist has drawn and typing in their guesses. Reading people's responses to the drawings is the best part of playing ISketch. There were times when I simply couldn't type in my own guesses because I was laughing so hard. You'll need Macromedia's Shockwave plug-in to play.

· SP Production; free; www.isketch.net

-Felicia Williams

built-in online communication system that enables teams to form, meet, recruit, and create a community. This game is at its most captivating when played against human adversaries over an Internet connection in real time, but it also invites users to take a crack at its built-in capability that allows a single-player

to compete against a software opponent. It's nice to have the option of playing Tribes 2 solo if the mood strikes, but you shouldn't mistake this pastime for a twitch game in the tradition of Quake. Success in Tribes 2 depends on teamwork. Players must work together to defeat other teams, though strong strategy and shooting skills come in handy as well. Ultimately, the game is so team-oriented that it's hard to enjoy if you don't join a group. And with the advent of aggregations such as the Online Gaming League (www.ogl.org), serious gamers have transformed Tribes into a semiprofessional sport.

· Publisher: Sierra Studios; Developer: Dynamix; \$50; 800/757-7707; www.tribes2.com

-Andrew Brandt

REEGE DOES WINDOWS: TV's most

### THE TRIVIAL PURSUIT OF HAPPINESS...

### Who Wants to Be a Millionaire 2nd Edition

VIRTUAL REGIS, IMAGINARY MILLIONS THIS ENTERTAINING but cheesy adaptation of the phenomenally successful TV game show (not entirely dairy-free itself) should appeal to all members of the family. The object of Who Wants to Be a Millionaire, of course, is to answer 15 multiple-choice trivia and general-knowledge questions of mounting difficulty. Players may use three lifelines if they get stuck on a question along the way. Purists, however, may quibble with some of the new rules introduced here. For starters, unlike the television version, this game times your answers-

there aren't any 5-minute pauses while contestants panic. And you can't choose to pocket all your winnings and quit while you're ahead: The CD-ROM version of Who Wants to Be a Millionaire makes you keep answering questions

unavoidable host doles out dough in Who Wants to Be a Millionaire 2nd Edition. until you blow one or win the whole pile. You do get talkative Regis Philbin to shepherd you along and offer some wry quips. Just don't expect him to ask, "Is that your final answer?" because in this version your first answer is your final answer.

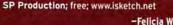
> · Publisher: Disney Interactive; Developer: Buena Vista Interactive; \$20; 800/900-9234; www. bvinteractive.com -Michael S. Lasky

### You Don't Know Jack 5th Dementia

JACK IS BACK-AS DEMENTED AS EVER IF YOU'RE STILL unacquainted with Jack. get ready for a wild time. This obnoxious, nutty party game designed for one to three contestants-competing against each other on the same PC or onlineparodies the standard TV game-show format. The latest entry in a long-running series, You Don't Know Jack 5th Dementia is unapologetically loud and rude, with questions that are so stupid ("Why did the chicken cross the silk road?") they're funny. Your host is a rah-rah, heavily caffeinated guy named Schmitty, who indulges in a constant rapid-fire deluge of lowbrow humor. As always, the game's multiple-choice questions are laced with attitude; and 5th Dementia also delivers a slew of anagrams, some gibberish translations, and a keyboard-intensive "Bug Out" round to keep you amused. To raise the hilarity quotient even higher, have all players squeeze together at the same keyboard to buzz in their answers. After just one round, everyone will know Jack.

· Publisher: Sierra Attractions; Developer: Jellyvision; \$30; 800/757-7707; www.ydkj.com

-MSL ■







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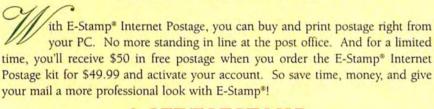
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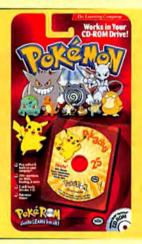
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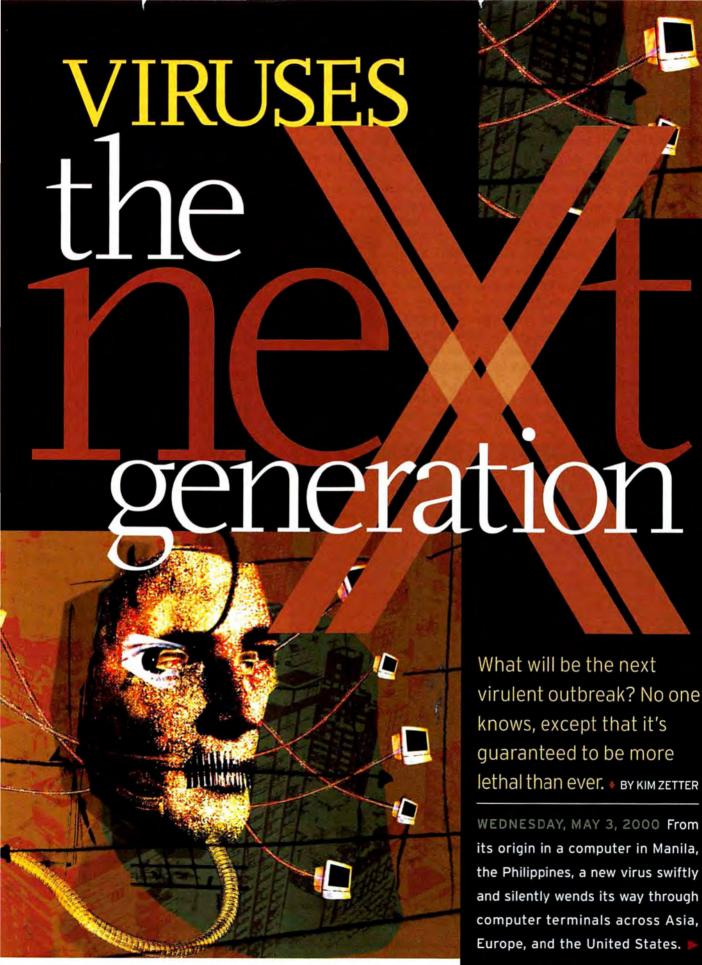
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ILLUSTRATIONS

Forging a fiber-optic path across continents faster than you can say, "You've got mail," the amorous parasite lands in digital mailboxes waiting to spread its love. Within an hour of its release, workers in London wake to an expression of affection from their blokes-and before long, e-mail is brought to a screeching halt in the House of Commons, followed by the Pentagon, Ford Motor Company, and a number of dot-com start-ups in San Francisco.

The Love Bug has arrived, and everyone's got it.

The Love Bug, also known as LoveLetter, spread more rapidly and widely than any electronic virus before it, striking 55 million computers (infecting 2.5 to 3 million of those) and causing \$8.7

billion in damage, according to research firm Computer Economics. By contrast, Melissa—the fastest-moving virus before LoveLetter—reached about 250,000 computers in March 1999. If you think that computer viruses are growing in speed and number, you're not imagining it.

In 1993, there were 3200 known viruses in the world. Today, there are more than 40,000—though only 200 to 300 of them are actively spreading, or "in the wild." Some 6 to 12 new viruses appear each day, and each generation gets sneakier than the last.

Viruses used to take months or years to spread, but current strains circle the globe in minutes via e-mail. What's more, the homogeneity of the computing world (with Microsoft's Windows, Word, and Outlook everywhere) makes it easy for viruses to infect millions of machines in one swoop.

But experts say we haven't begun to see the worst that viruses can offer. "If the virus writers ever thought through their programs," says Ron Moritz, chief technical officer for antivirus developer Symantec, "we would see much more virulent viruses that would really do damage." In other words, the superviruslike the oft-predicted Next Big Quake in California-has yet to materialize. But no one doubts that it will.

According to experts, future viruses won't need you to open an attachment or e-mail to begin inflicting harm; they'll simply acti-

The [LoveLetter] virus struck on May 3rd, and within minutes calls began coming in from Europe complaining that we were hosting a virus. We took the four [affected] Web pages down, but even now we still get people infected with the virus coming to the site. ??

> Roberto Villabona Vice President Sky Internet Manila, Philippines

vate when you check your e-mail program for new correspondence. We may also see cluster viruses that spawn miniviruses inside your system to attack various sectors and thwart scanning software. There are already cases of rogue Web sites that steal files or passwords from computers, as well as the first viruses for Palm PDAs (see page 198). And viruses targeting mobile phones and Linux systems aren't far away. Eventually, viruses may be used as agents of cyberterrorism to attack government defense systems, steal data, and disable communications.

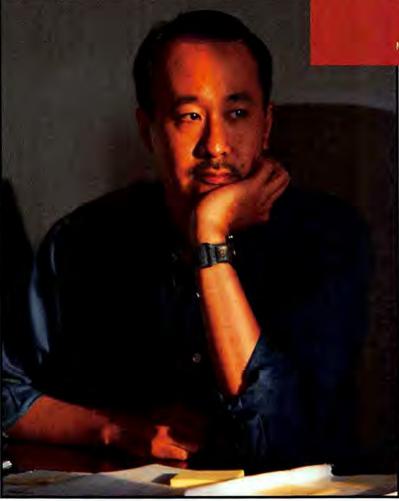
Researchers agree that the threat viruses pose is getting worse. Educating yourself and securing your computer with the right tools can help you avoid trouble. The experts advise: Disable macros in your applications; download patches for software holes; install a good virus scanner; and get weekly updates to the scanner to catch the latest culprits (for more virus prevention tips, see "Kill Viruses Before They Infect Your System," page 198). Some virus fighters propose fully automating the inoculation processa move critics say would give security companies too much control over your PC.

But true immunity to viruses doesn't exist. Just as it's hard to stop a crime before it happens, it's difficult to halt a virus before it damages at least a few computers. Some businesses want to make writing or posting malicious code illegal; but opponents argue that such measures would compromise freedom of speech.

### THE DIGITAL COMMON COLD

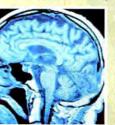
MUCH MYSTIQUE SURROUNDS viruses and virus writing. But viruses are no real mystery. Nearly anyone with a bit of programming knowledge can write one in less time than it takes to download a Moby track from Napster.

Simply put, a virus is a piece of code that instructs your computer to do something (called the "pay-



1983 Virus researcher Fred Cohen coins the term "computer virus" in a research paper.

1987 Brain, the first computer virus, is released. It infects the boot sector of 360KB floppy disks and uses stealth techniques to leave the computer unaware of



it. Stoned (the first virus to infect the Master Boot Record) is released. It scrambles the hard drive's MBR, prevent-

ing a system from booting.

1988 The first antivirus software is released by an Indonesian programmer. It detects

the Brain virus, excises it from a computer, and immunizes the system against further Brain attacks.

The Internet Worm is released onto the nascent Net and brings down about 6000 computers.

1989 Dark Avenger appears. It infects programs quickly, but the subsequent damage happens slowly, permitting the virus to



go undetected for a long time. IBM releases the first commer-

cial antivirus product. Intensive antivirus research commences.

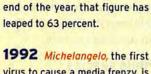
1990 Sophisticated virus types such as polymorphic viruses (which modify themselves as they spread) and multipartite viruses (which infect multiple locations in a machine) appear.

Virus-exchange bulletin boards

become popular methods for writers of viruses to post and exchange source code.

1991 Virus construction kits, which allow almost anyone to build a virus easily, appear on virus exchange boards.

At the beginning of the year, a modest 9 percent of companies polled have experi-

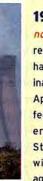


enced a virus outbreak. By the

1992 Michelangelo, the first virus to cause a media frenzy, is set to overwrite parts of infected hard drives on March 6, the Renaissance artist's birthday. Sales of antivirus software soar, though only a few cases of actual infection are reported.

1994 The author of a virus called Pathogen in England is tracked down by Scotland Yard and sentenced to 18 months in jail. This marks the first time a virus writer is prosecuted for promulgating damaging code.

1995 Concept, the first macro virus, appears. Written in Microsoft's Word Basic language, it can run on any platform that Word runs on-PC or Macintosh. Concept triggers an explosion in the number of viruses written, because macro viruses are so easy to create and disseminate.



1999 The Chernobyl virus, which renders the user's hard drive and data inaccessible, hits in April. Though it infects few computers in the United States, it inflicts widespread damage overseas. China

sustains damages of more than \$291 million. Turkey and South Korea are also hit hard.

The Melissa virus strikes hundreds of thousands of computers worldwide. It uses Microsoft Outlook to mail itself to 50 people in a user's address book, making it the first virus capable of jumping from one computer to another on



2000 The LoveLetter virus, launched from the Philippines, sweeps over Europe and the United States within 6 hours, It infects some 2.5 million to 3 million machines, causing an estimated \$8.7 billion in damage.

-Some information taken from Joe Wells's timeline at www.av.ibm.com/ Education/Timeline/timeline/html

load") that you don't want it to do. The payload can be as harmless as inserting an inane quip from South Park into your department's status report. Or it can be as damaging as erasing your hard disk or installing a secondary program that lets someone else take over your system.

One defining characteristic of a virus is that it replicates itself. It contaminates your system by copying itself into programs, documents, or system files, in the same way that a biological virus copies itself and attacks organs in your body. Once a virus infects these files, its payload can be triggered to go off at any time or in response to an activity such as opening Word or hitting <Ctrl>-P. One part of the Melissa payload activated whenever the time of day matched the date. So at 4:10 on April 10, a quote from The Simpsons would pop up on the screen.

Macro viruses-those written in macro programming language-account for some 75 percent of viruses in the wild because they're easy to write and disseminate. (For more about types of viruses see www.pcworld.com/how\_it\_works/viruses.)

Two other types of malicious code-worms and Trojan horsesshare some characteristics with viruses but aren't categorized as such. A worm replicates like a virus but doesn't alter files or zap data. Instead, it slithers through network connections, collecting addresses of other systems on the network and passing copies of itself from PC to PC, thereby clogging the network.

Unlike viruses and worms, a Trojan horse doesn't replicate. It's a malicious program that comes disguised as something benign, such as a screen saver or a chess game. When loaded onto your machine, it can capture information from your system or allow someone else to commandeer your computer remotely.

### THE ORIGIN OF VIRUS SPECIES

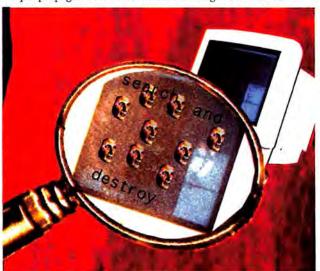
THOUGH MOST OF THE COMPUTING public has become aware of viruses only in the last five years, they've been around since the 1960s. Early versions existed only as test programs in research facilities. In the late 1980s, a handful of viruses were unleashed by individuals, but these infected primarily university machines and research centers. They traveled slowly via the "sneaker net"-that is, through infected floppies. By the mid-1990s, however, two developments revolutionized virus writing.

Just as airplanes and international travel accelerated the spread of biological viruses worldwide, the Internet and e-mail served to provide convenient vehicles for fast-acting computer viruses that could contaminate hundreds of thousands of machines all around the world. And in 1995, Microsoft introduced WordBasic, a text-based programming language for writing macro commands that vastly simplified the writing of viruses.

edly received 32,000 copies of the virus in less than an hour.

A year later, LoveLetter did Melissa one better by mailing itself to every address in a user's Outlook book. As administrators scrambled to shut down infected e-mail systems, they found an average of 600 copies of the virus jamming each user's out-box.

Although the Melissa and LoveLetter viruses were fast moving and fairly annoying, neither destroyed users' hard drives or rendered systems inoperable. Symantec's Ron Moritz says that a supervirus would effectively combine destructive capability with rapid propagation to inflict massive damage in a short time.



The NewLove virus, which followed on the heels of LoveLetter in

June, was the closest we've seen to a supervirus, Moritz says. Unlike its predecessor-which infected documents but did not damage operating systems-NewLove corrupted system files, render-

ing infected computers inoperable. This, combined with the swift spreading capability of LoveLetter, would have resulted in widespread destruction-if it had worked. But, says Moritz, "The author didn't think through the propagation issue, [and the virus] zeroed out Outlook before it could send itself to other systems." In other words, it killed the messenger.

### THE NEXT GENERATION

THE EXACT FUTURE of viruses is difficult to predict, but they will certainly become more virulent and harder to combat. New technologies and software flaws continue to make the spread of viruses easier, and antivirus techniques must evolve to keep up.

Fred Cohen, the security expert who coined the term "computer virus" in 1983, says that the nature of viruses will continue to evolve. "It's unlikely that anyone will create a virus that will spread to every computer system in the world and destroy everything," he says. "But more-sophisticated viruses would be better targeted and would have much more longevity." He describes a future virus that—once it entered a system—would spawn subvariants, which would in turn spawn their own variants, each affecting the computer in different ways. Detecting and

we haven't begun to see the worst that viruses

June, was the supervirus, N

can offer The arrival of macros meant that almost anyone could slap together a command telling a computer what to do, embed it in an e-mail attachment, and send it off. The minute a user opened the attached document, the macro would execute, and the virus would infect the system, ready to deliver its payload.

The first macro viruses appeared in 1995. By 1998 there were more than a thousand of them. But the speed at which these viruses spread was still tied to how often people shared infected floppy disks or e-mail attachments. If a user didn't pass the disk or attachment along to someone else, the virus couldn't spread. In 1998, however, the Melissa virus arrived, and suddenly the user was no longer an important factor in the equation.

### MELISSA'S CONTRIBUTION

MELISSA ARRIVED as an e-mail attachment. As soon as the recipient clicked on the attachment, the virus used Outlook to mail itself to the first 50 entries in the recipient's address book. Melissa also infected the user's Word document template, so any document created thereafter would be infected and mailed to the first 50 addresses as well. The virus began to spread on a Friday, and by the next Monday it had reached some 250,000 computers, causing companies to close their mail systems and the federal government to launch an investigation. One company report-



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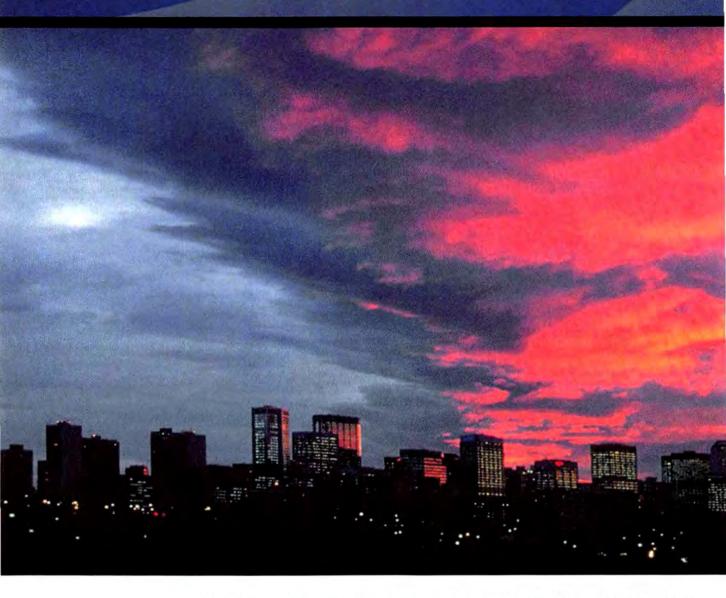


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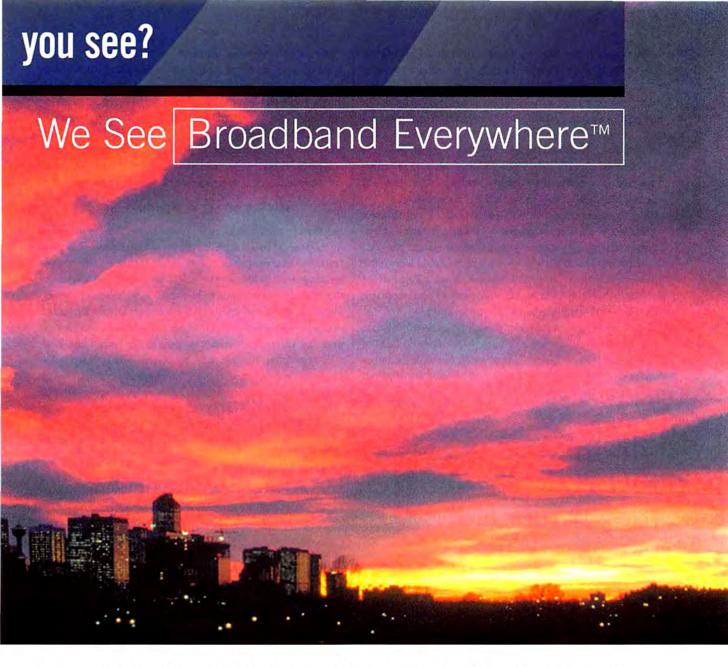
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eliminating all of the offspring of such a virus would be difficult.

We've already seen one type of advanced virus that's bound to proliferate in the future. This new variety—the recent Bubbleboy and Kak are examples—comes embedded in e-mail text and activates without users' opening an attachment. A combination worm and virus, it contains HTML coding that exploits a vulnerability in Outlook and Internet Explorer 5x. Once you open the e-mail message, the code copies the virus onto your systemin the case of Kak, into the Windows start-up folder. The next time you launch Windows, the virus delivers its payload.

Recently discovered vulnerabilities in Outlook and Outlook Express would allow some viruses to go a step further-infecting your machine even before you read the message. No such virus currently exists, but a specimen like this could launch the minute you checked your e-mail. You can download a patch for the Outlook flaw at www.pcworld.com/downloads, but more vulnerabilities of this type are bound to crop up again.

The future of viruses, however, doesn't lie in destroying data but in capturing it. Srivats Sampath, president and CEO of McAfee.com, warns, "We're going to see an increasing number of malicious Web sites that will try to steal information from you while you are browsing." McAfee researchers say

kill. viruses be they infect your

YOU DON'T NEED to be paranoid about computer viruses-just alert, aware, and willing to take steps to protect yourself.

Install an antivirus utility and update it often. An antivirus program is simply the most essential software you can add to your PC. For reviews of products, see "The SWAT Team" (www.pcworld.com/ feb00/bugs). Consider your options during setup; at a minimum, you should enable full-time automatic scanning and make sure the utility checks the contents of .zip and other compressed files.

Antivirus vendors update their virus definitions-the files they use to spot viruses-every week. For maximum safety, you should update that often, too. Some utilities can automatically add definitions as they become available. Be cautious about macros.

Safeguard your PC by enabling macro security options in your software packages. In such Office

2000 apps as Word and Outlook, for example, select Tools • Macro • Security... and be certain that the Security Level is set to High or Medium.

Update your Internet software. The majority

of today's viruses arrive via e-mail, so make sure your e-mail program is up-to-date. Microsoft most e-mail-based virus- to check everything.

download something to your system, but most firewalls can't yet tell you when a site is trying to siphon information from you. However, the latest version of McAfee.com's personal firewall and privacy service-which debuted in September-informs surfers when a site is trying to read files or take information. BEWARE OF GEEKS BEARING GIFTS EXPERTS EXPECT TO SEE more Trojan horses that use ingenious methods to get into a victim's system-for instance, a virus/Trojan horse that comes disguised as an electronic invitation or greeting card. Click on a hyperlink in the e-mail, and you're sent to a Web site where rogue code instructs your system to upload files silently to a remote site on the Internet. Experts also anticipate seeing viruses for the Linux operating system as a growing user base makes it a more attractive target for virus writers.

In September, the first virus for a handheld appeared—the Phage virus, which targets the Palm operating system. Though not yet in the wild, Phage infects and destroys all applications on

they've already received numerous reports of sites that auto-

download a Trojan horse capable of sending information back to its author. So far, security companies have no solution to this

threat. Some protective software will tell you when a site tries to

a Palm and can spread when the user shares apps via syncing or beaming. Symantec's Moritz expects more assaults on handhelds in the future. "These are all

es, and Microsoft regularly releases new security patches. Don't ignore your Web browser either. The latest patches close some ActiveX and Java security holes.

Keep your brain in gear. Don't open attachments from people you don't know, and be suspicious of attachments from those you do. Be especially wary of any file that has a .vbs extension.

Even if you think it's a legitimate file, don't open it with your e-mail program. Save it to disk and run it through a virus scanner first.

Protect your network. If you're responsible for networked PCs, you may want to block users from receiving particular types of e-mail attachments, such as .exe or .vbs files. Server-based e-mail programs offer sophisticated versions of this functionality, but

> Outlook carries only a bare-bones version, Don't ignore the balance between security and productivity: Blocking all .doc files might help keep macro viruses away, but it will also hamper your ability to work efficiently.

Back up frequently. Whether you run a home PC or a corporate network, regular backups are essential in case your precautions fail and a virus does sneak in.

-Stan Miastkowski



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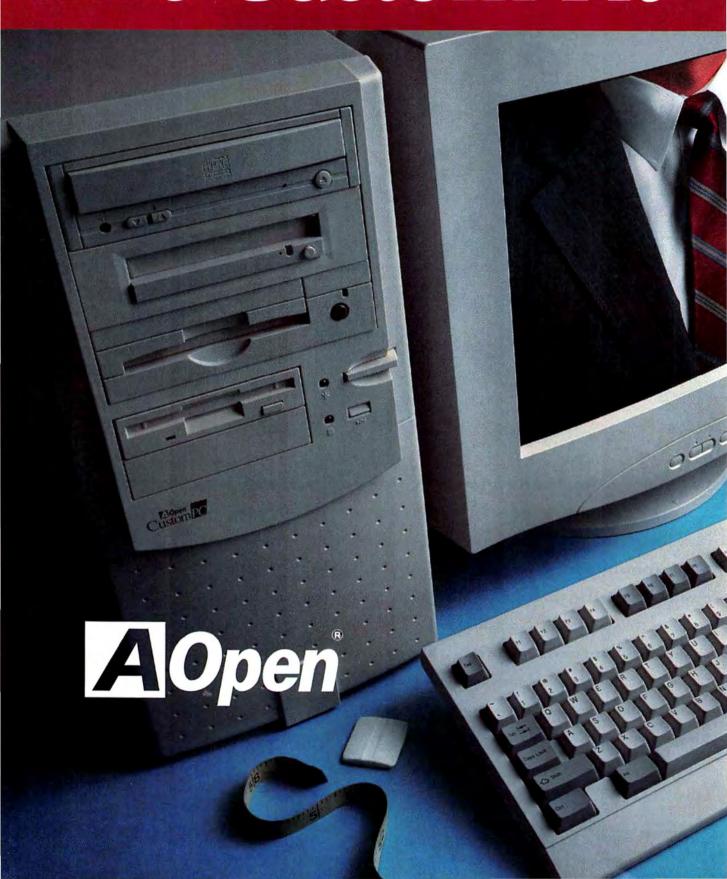


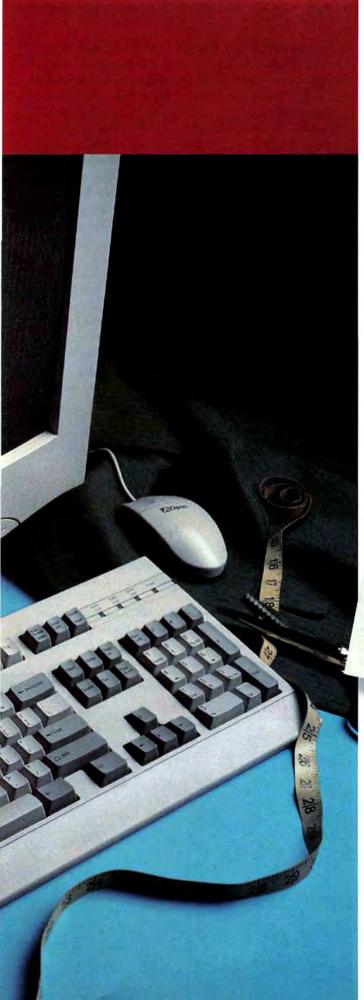






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fairly insecure platforms, and...I have full confidence that people...will develop new attacks [for them]." Antivirus vendors have already developed products to scan handhelds for malicious code.

While individual users and corporations face increased risks from viruses and Trojans, the biggest threat, experts say, lies in the potential for malicious code to be used in cyberterrorism. "Vladimir Zhirinovsky [leader of Russia's ultranationalist Liberal Democratic Party] in Russia has publicly stated that countries should...bring the West to its knees by using an offensive virus or Trojan [horse]," says Moritz. "To be honest, I'm surprised that we don't already see these things happening today. This very likely may be the next big threat-to have weapons of mass destruction based on [computer and Internet] technology."

### **FUTURE DETERRENCE**

HOW DO YOU PROTECT YOURSELF? Antivirus software remains your best bet. The programs use two approaches to spot viruses: scanning and heuristics. Scanning looks for signatures-recognizable strings of code that identify

when. came to town

HERE'S A LOOK at how the LoveLetter virus reached 55 million computers and how authorities tracked the outbreak to its origin. (Dates and times are EDT.)

May 3, 2000 The LoveLetter virus is released in the Philippines. Soon after, Sky Internet, a Philippine ISP, notices thousands of infected computers dialing in to four hosted Web pages to get a Trojan horse posted by the virus writer. The company removes the suspect Web pages.

The virus arrives as an attachment to an e-mail titled "I Love You." In addition to grabbing the Trojan horse, it sends itself to everyone in the user's Microsoft Outlook address book, and deletes or overwrites JPEG and MP3 files.

May 4, 4:12 a.m. Symantec and other antivirus vendors start to work on a definition for the new virus.

7 a.m. Most antivirus vendors have definitions available, but it's already too late for the U.S. East Coast, where workers have begun to open their e-mail.

10 a.m. Investigators discover that LoveLetter's author left his nickname (Spyder), his e-mail address, and the name of his hometown in the source code. He also identified himself as a member of a programmer's group known as GrammerSoft.

4 p.m. The first LoveLetter variant appears, with "Very Funny Joke" replacing "I Love You" in the e-mail's subject line.

6:40 p.m. At least 20 countries have reported infections.

May 5 Nine variants of the virus have appeared. Amateur sleuths, including a Stockholm grad student named Frederik Bjorck, search newsgroups using keywords found in the virus. Bjorck finds similar viruses posta known virus or variant. Heuristics look for abnormal activity, such as a program that attempts to write to your Windows Registry. If your antivirus software is up-to-date, known viruses will get zapped before they can harm your system. (Most vendors update the signatures they scan for weekly-except during rabid outbreaks, when they may post two or three updates a day.)

But today, says Symantec's Moritz, new viruses have the potential to spread faster than humans can respond. And, he says, "Internet viruses can outrun antivirus software."

At present, it takes antivirus vendors 1 to 4 hours to scan and examine a virus, produce an antidote, and deploy it to users. But it takes only a few seconds for a virus like LoveLetter to spread from Tel Aviv to Toledo. So what's a user to do?

Some antivirus companies have begun to adopt automated scan-and-send systems. If their program sees code that does not match a known virus but behaves strangely, it will send the code back to the antivirus vendor for evaluation. But Symantec aims to take the process a step further with its closed-loop technology, included in corporate antivirus packages distributed to clients this past October. The result of a 12-year project developed at IBM's Thomas J. Watson Center under the name Digital Immune System, the program automates detection and antidote

ed by Spyder four months earlier, including a version that identifies the author as a "student of amacc mkt. Phils," an abbreviation for the AMA Computer College in suburban Manila.

May 8 After identifying the phone number and computer from which the virus was sent. local authorities raid the apartment where they believe Spyder resides. Police find no computer, but they seize a disk containing a virus similar to LoveLetter.

May 11 Authorities question Onel de Guzman, who lives in the apartment. He admits he may have released the virus accidentally, but denies writing it.

June 29 The Philippines has no antivirus law, so de Guzman is charged under a law that usually applies to credit card theft.

August 21 Authorities conclude that the credit card law cannot be applied in this case and reluctantly drop charges.



distribution in a way not previously attempted. Ultimately, it aims to compress a process that currently takes 1 to 4 hours into 30 minutes.

Here's how the system works: When local scanning software detects suspect activity on a computer. it quarantines the code and sends it to a series of servers, where other software attempts to create a definition for the virus. If the software succeeds, the system delivers the definition to every Symantec client using the system, thus protecting clients who haven't received the virus yet. If the servers fail, Symantec researchers on call around the clock step in to create a definition and return it down the chain. Eventually, the automated update process will be tied to Symantec's LiveUpdate feature, so individual users not on a corporate plan can get new definitions as well.

Critics worry, however, that this process may give antivirus software too much power over your computer. Fred Cohen sees serious potential consequences with authorizing a centralized system to pull files-including those that may be misidentified as viruses-from a client's computer and then deposit

unfamiliar code from a remote server onto the client's system. If a hacker were to infiltrate the flow of information back to the client's computer and insert malicious code in it, Cohen says, there would be nothing in place to stop the code from infecting the machine.

Moritz says that the program lets the system administrators choose to view every file going out and coming in, although doing so would slow the rapid response time that is the program's most significant selling point. And he points out that transferring the information through a secure Web protocol such as https would ensure that no one could view or alter files in transit.

But what would happen if Symantec's servers were hit with an attack in the midst of a global virus crisis? "If someone were to attack these servers...at a critical period," Moritz says, "say, when we were trying to deal with a virulent outbreak like the NewLove virus, then they could certainly have a lot of impact."

### LEGAL REMEDIES

ANTIVIRUS PROGRAMS CAN help contain a virus that's in the wild, but some businesses and legislators want to stop viruses at their source. They advocate harsher laws to punish virus writers and even want to outlaw the writing and posting of virus code.

But most virus writers believe that they won't get caught, and they say that laws therefore won't deter them. In addition, in a 1999 case involving encryption, a U.S. Court of Appeals held that computer code is protected under the First Amendment. Furthermore, "malicious" is a slippery term to define. Any code that interferes with the smooth operation of a person's system



about the "I love you" message. From the top to the bottom of the org chart, few people could hold themselves back from opening the e-mail. We found thousands of infected messages once our scan was complete. 🤧

> Frank Keenv Security Consultant Pasadena Networks Pasadena, California

could conceivably be characterized as malicious.

Legal wrangling aside, new viruses will always exploit software and system vulnerabilities and are bound to evade scanning software when first released. That's why virus education is important.

Sampath and Moritz say that users should be cautious both in opening e-mail and in surfing the Net. "The Internet is like a Mad Max movie-a lot of people with dune buggies and funny haircuts trying to shoot your head off," says Sampath. He advises users to surf the Net with the same caution

they'd use while traveling over dangerous streets. "If you go to the grocery store and the drive is through a bad neighborhood, you're going to take a 10-mile detour. But on the Internet we happily browse along, not realizing which neighborhoods [are bad].

"What we're trying to build into people...is that anytime you go on the Internet, you need to protect yourself....We're looking at different ways of getting that message out-short of a virtual hand that comes out of your screen and grabs you."

So is it safe to conclude that antivirus companies won't be running out of business anytime soon? "It's not a bad time to be a security-focused company," says Moritz.



For additional coverage of viruses, see www.pcworld. com/news/dec2000/viruses. You can find files mentioned in this article at www.pcworld.com/downloads.

Kim Zetter is a senior associate editor and Stan Miastkowski is a contributing editor for PC World.



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Crucial packs its Web site with essential, readily accessible information about memory upgrades. "Whenever I have questions about RAM or need term definitions, Crucial has the answers," Burke says. "And they're always very easy to find." Crucial educates consumers with up-to-date tips and how-to features, articles about memory manufacturing, and answers to frequently asked questions about DRAM. Crucial's Memory Terms Glossary defines hundreds of phrases, from "access time" and "Ambyx Oven" to "write time" and "zero page addressing." And Burke and other buyers can browse articles with titles such as "How to Prevent Your Home Computer from Becoming Obsolete Before its Time" and "Pushing the PC Limits: How Much Memory Does a High-End System Need?"

Shoppers can also search under almost two dozen categories and subcategories at the Crucial FAQ Center and



find answers to such questions as "What is the performance difference between CL2 and CL3?" and "What is the difference between ECC and non-parity memory?" The section's troubleshooting solutions and advice are accurate and in-depth. And users are prompted after each FAQ response to click a radio button to let Crucial know whether their questions were answered.

Users who do not find their questions among the hundreds in the FAQ Center can write directly to the FAQ team, which responds to all gueries within 24 hours—a part of the company's Quick Response Policy. In fact, Crucial's technical support staff are available, toll-free,



throughout the day and evening, Monday through Friday-and even for four hours on Saturday.

But the layout of Crucial's site makes it almost impossible to get lost when you're searching for upgrades and answers. Crucial's Memory Selector tool offers more than 49,000 upgrades for over 10,000 PCs and printers, all of which are guaranteed to be compatible with the systems they were designed for. (Micron works closely with OEMs like Intel to ensure complete compatibility and stability at high processing speeds, and tests its modules at high temperatures and under extreme temperatures, voltages, and operating conditions.) "The site's tools make it a pleasure to shop at Crucial," Burke says. "They are certainly doing a great job over there." >

# The world's largest PC manufacturers buy our memory direct.

Genius.

Buy your memory direct from one of the largest memory manufacturers in the world. Performance, reliability, selection and factory-direct savings -Crucial Technology, a division of Micron.

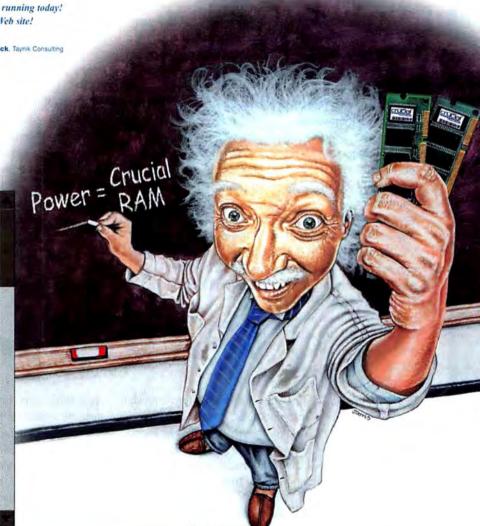
I ordered my memory vesterday and am up and running today! Super service, super product, and outstanding Web site! I will recommend Crucial to anyone!!!

Jim McClintock, Taynik Consulting

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64MB Upgrades		
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IBM	Kingston	Crucial
Aptiva (2153) Model E2U	\$96.00	\$62.99
Aptiva (2139) Model E5D	\$96.00	\$62.99
HP	Kingston	Crucial
Pavilion 4530	\$112.00	\$62.99
Pavilion 4535	\$112.00	\$62.99
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440BX Chipset	\$129.00	\$75.59
Vectra VL Series 8	\$96.00	\$62.99
Apple	Kingston	Crucial
iMac (G3-350)	\$96.00	\$62.99
Power Mac G3 PC100	\$111.00	\$62.99
Power Mac G4	\$108.00	\$62.99

Crucial prices reflect an automatic 10% discount for ordering online. Prices were taken from Crucial and Kingst Web sites on 10/300, however, they can (and do) change daily. Price may vary according to specific system requirement.



Online discounts for over 49,000 upgrades at:

www.crucial.com

or call toll-free 1-888-363-3065



The Memory Experts"

## Bookmark

# Pioneer: Leading the Way in **DVD-R Technology**

www.pioneerusa.com

Pioneer 2000

Compatibility, archivability, and the ability to make your own DVDs are the three most important and exciting features of the DVD-R format. DVD-R-a write-once medium that can store video, audio, graphics, electronic photographs, and any other type of digital information-represents a natural progression from CD-R technology to a higher-capacity medium.

In early 1998, Pioneer shipped the world's first DVD-R drive, a product that quickly became an indispensable tool in the professional video world. Today, businesses from every facet of the corporate world-including government, banking, legal, medical, and the entertainment/broadcast industries-depend on DVD-R to meet their write-once archival storage needs.

The beauty of DVD-R technology is its compatibility with existing DVD video players and DVD-ROM drives, says Andy Parsons, senior vice president of product

development and technical support for Pioneer New Media Technologies Inc. "If you record something to DVD-R, it can be played on most DVD video players and

DVD-ROM drives. This provides maximum interchangeability and portability of recorded discs, much as CD-R media does in the CD world. Interchangeability is important, because you can always find a player or drive that will play your disc-a capability that is critical in the real world. DVD-R is the only writable DVD format that can do that.

"Pioneer has always tried very hard to ensure that our products provide the best likelihood of compatibility. It's important to us to make products that will conform well to the existing world, and that will allow as many people as possible to use the technology."

DVD-R is also a very secure medium, so corporations with stringent archival requirements "don't have to worry about accidental erasures," notes Parsons. And DVD-R media has a very long life expectancy-100 years, in the case of Pioneer discs. "You get the key benefits of optical discs-quick random access, durability, and long life. You can put whatever you want on DVD-R, run it all day long without wear and tear, and then store it for many years."

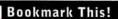
But perhaps the "killer app" for DVD-R lies in the emerging consumer market, where you can be your own Steven Spielberg or Oliver Stone. "A fundamental capa-

> bility of DVD-R is the ability to make your own DVDs," says Parsons. "You can digitize your old camcorder or videotape footage on your PC, store it to DVD-R disc, and watch it in

your living room instead of on your computer, if you prefer," he explains. "And when you're done watching it, you can send the disc to relatives to watch on their DVD video players. Again, DVD-R's interchangeability is what makes this possible."

As demand for blank DVD-R media grows, "it has the potential to become very inexpensive," says Parsons. "As demand increases to a high-enough volume, there is no reason why DVD-R discs can't be as inexpensive as CD-R discs are today."

That's good news for today's corporate archivist as well as tomorrow's Steven Spielberg. >



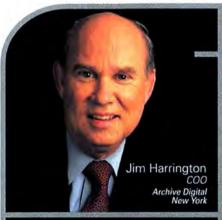
onee



# R/RW

# Pioneer recordable technology, the natural progression of optical recording

Industry professionals around the world rely on Pioneer when they record to DVD. Like CD-R and CD-RW, the write once DVD-R and rewritable DVD-RW formats allow you to record with confidence.



Paul LaVigne
President
Digital Video
Michigan

"Archive Digital is entrusted with irreplaceable historical footage daily. The storage capacity, search engine capabilities and high resolution of Pioneer's DVD-R technology make it the obvious choice."

"Bringing DVD technology to the courtroom allows attorneys instant access to demonstrative evidence and pre-recorded testimony, reducing court time, paperwork and costs while engaging and visually stimulating jurors and judges."

"We provide a full suite of DVD solutions from interactive programming to replication and duplication of this highly interactive and portable format."

"Potentially the most complex and creative format devised for multimedia content."







PIONEER NEW MEDIA TECHNOLOGIES, INC. Optical Systems Division for more information, call

**1-800-444-6784 ext. 212** or visit www.pioneerusa.com

Pioneer's DVD recordable drives and media are available through local resellers nationwide.

# Bookmark This!

# CDW.com: Streamlined **Extranet Shopping**

0

### www.cdw.com

In today's hotly contested IT consulting marketplace, your supplier can make or break your business. "You've got to have B-to-B [suppliers] that combine excellent prices with ease of use," says Brian Nunes, a technical consultant at MTH/Information Solutions LLC in Spartanburg, S.C. Supplier sites should also provide ondemand, 24 X 7 order status information to their customers, he notes. "I want to know right away that an order has gone through, and I expect an e-mail confirmation telling me that an order will be shipping on time."

MTH implements and maintains accounting systems, networks, and Web sites for leading business clients in the Southeast. The consulting firm tailors its services to meet the needs of organizations large and small, in every business sector. "We do everything we can to get our clients up and running quickly, from planning and purchasing to installation and training," Nunes says. "And we expect the same kind of attention and relationship-building efforts from our suppliers."

Nunes currently enjoys attentive service from his account manager at CDW, the number-one authorized direct seller of hardware and software from Compag, Computer Associates, Microsoft, Toshiba, and other top-brand-name manufacturers. "If we are unsure about which product to choose, CDW tells us what we need and why we need it," he explains. CDW builds relationships with small and midsize buyers like MTH through customized purchasing features, personalized customer service, and special offers.

Nunes' CDW account manager tries to answer all of his questions as quickly as possible. "Even if he's busy with other customers, he always gets back to us within an hour or so," Nunes says. CDW's rapid response time has helped secure new business for MTH. "When you're making a bid or proposal, you don't have much time to pull your pricing information together. You need accurate quotes, fast."



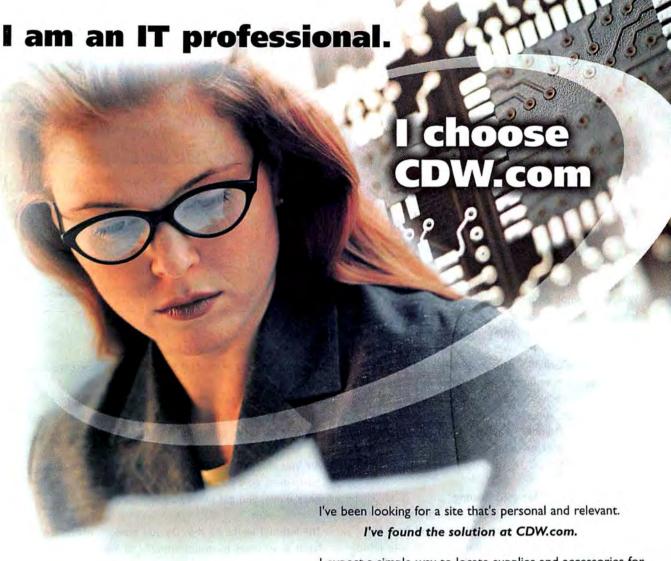


Computing Solutions Built for Business™ www.cdw.com 800-306-4239

CDW extends volume-pricing discounts to MTH automatically with every price quote (based on its prior sales to the consulting firm). Plus, CDW is making deals with holders of the American Express Corporate Card for Small Business through the end of the year. Online buyers who use their cards will earn triple Membership Rewards points until December 31, 2000.

MTH buys most of its routers, hubs, and printers through CDW's free B-to-B extranet. Through the extranet, Nunes can access order-status information and the details of MTH's purchasing history, and use CDW's online memory configurators and side-by-side product-comparison tools to find the right product for a job. Nunes can also use the extranet to set standards and determine which products MTH will support in its client installations. The site organizes standards lists by individual products or product groups, preferred brands, product comparison charts, or customized shopping cart bundles. All of MTH's employees can access this information, but only those with administrator rights can change it.

"It's pretty cool having our own pricing system with CDW.com," Nunes says. "And having the extranet means that we don't have to keep typing in our credit terms and shipping info over and over again." MTH also has multiple shipping addresses, and CDW remembers them all. "They've got everything we want. CDW understands how we do business." >





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# RACKSPACE: Outsourcing your hosting headaches



#### www.rackspace.com

In today's e-business playground, if you're not on the Web, you're not in the game. But for many evolving e-businesses, the technical challenges of establishing and running a successful Internet site can be daunting. To be successful in the Web-driven economy, a site must be scalable, affordable, and absolutely reliable. Most sites are now hosted on complex Web servers, which are expensive to purchase and maintain. Servers, facilities, setup, and security are a few of the key infrastructure challenges any Web-enabled organization must face, even before loading the software that makes a Web site work.

#### A New Approach—Managed Hosting

A new server management model has emerged one that solves this platform challenge and frees the enterprise to focus on applications, strategy, and e-business opportunities. Managed hosting offers significant benefits to Web designers, application service providers (ASPs), and corporate end users. Today, e-businesses benefit by leasing dedicated servers from managed hosting providers such as Rackspace Managed Hosting.

"By renting servers month-to-month, companies avoid the heavy capital investment needed to build and maintain their own infrastructure," said Graham Weston, chief executive officer of Rackspace Managed Hosting. "And ongoing costs are diminished by outsourcing the technical aspects of keeping the servers up and running."

Unlike virtual hosting, where numerous Web sites share space on a single server, managed hosting provides the security and flexibility of a customized server dedicated to only one company. Unlike colocation, which requires companies to purchase, configure, and manage their own servers, managed hosting decreases set-up and ongoing costs while eliminating the risks of managing your own infrastructure. And, managed hosting provides virtually instant access to the precise level of server resources needed to get the job done.



#### Rackspace Excels Where Others Do Not

Ask your hosting provider if they do it the Rackspace way:

Can you get my business up and running in Internet time? Rackspace guarantees to have a server customized for your business online in less than 24 hours.

Are you accountable if my site goes down? Rackspace guarantees 99.9 percent network uptime, so if your site goes down, you get money back.

The Internet works 24 X 7. Do you have an expert on hand at all times to troubleshoot? Call Rackspace any time of the day or night, and you get instant access to a tech expert capable of solving any problem you might have.

With Rackspace, when it comes to fulfilling your hosting needs, the answer is-absolutely. Need a robust security solution to guarantee data integrity? No problem. Need to add a server for a special promotion? We do it every day. Looking for robust back-up solutions to guarantee



vou never lose data? Sure. How about content distribution services to ensure the best end-user experience possible? Definitely.

"Everything we do is built on fulfilling critical customer needs as quickly as possible," said Weston. "The managed hosting concept, combined with our fanatical commitment to customer satisfaction, offers e-businesses of all types a new way of reaching their customers reliably, without the headaches." >

# **Absolutely.**

Do you have guaranteed uptime of 99.9% or better?
Is a tech expert available if I call in the middle of the night?
Can you get my server up and running in less than 24 hours?
Will you increase my capacity as quickly as my business grows?
Can I sign up with only a month-to-month commitment?

Will my hosting headaches go away?



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#### The Rackspace Advantage

Guaranteed Uptime: 99.9% uptime supported by five premium backbones from our world-class Cisco-powered data centers.

Unmatched Speed: We guarantee to have your custom-configured server online in 24 hours or less. Standard servers can be up and running in less than one hour.

Fanatical Support: Our Linux, NT/W2000 and Solaris specialists are available instantly 24 hours a day.

**Unlimited Flexibility:** With no long-term commitments, you have the flexibility to increase or decrease your capacity anytime.

#### A Few Options

#### Rackspace Starter:

- 600MHz Processor
- 256MB RAM
- 20GB EIDE Drive
- · 10GB Burstable Data Transfer
- · 24x7 Support
- Monthly: \$299

#### Rackspace Advanced:

- 800MHz Processor
- 18GB SCSI Drive
- 256MB RAM
- 12/24GB Tape Drive
- Offsite Tape Storage
- 50GB Burstable Data Transfer
- · Advanced Monitoring
- · 24x7 Support
- Monthly: \$859

#### Rackspace Cluster (Two servers with the following):

- Dual 750MHz Processor
- 2x9GB SCSI Drive with RAID 1
- 512MB RAM
- 12/24GB Tape Drive
- · Offsite Tape Storage
- 50GB Burstable Data Transfer (per server)
- · Advanced Monitoring (on each server)
- 24x7 Support (on each server)
- · Load Balancing
- Monthly: \$2999
- All configurations priced for Red Hat Linux 6.2 and exclude one-time setup fee.

#### Tell Us What You Need

Custorn configure and price a hosting plan perfect for your business right now at www.rackspace.com.

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#### Bookmark This!

## **PC** America:

**Inventory Management** at Point of Sale

#### www.pcamerica.com

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."

PC AMERICA

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.

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



point-of-sale products you need.

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." >

#### Cash Register **Express Software**

for Windows...\$495

Computerize any type of retail store using Cash Register Express for Windows. Computerization pays for itself, saving you thousands of dollars, giving



has more than 250 of the most desired point of sale features to help you leapfrog past your competition by controlling costs, reducing

#### More Software for Your Retail Store

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- Auto Express
- RestaurantPro Express
- Barcode Express
- Label Works
- Inventory Track Express

- Credit Card Software
- All Single or Multiuser

All PC America Software requires Microsoft Windows. The software was written in Visual Basic using Microsoft Access Files. The source code is available.

# CASH-REGISTER EXPRESS

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\*All prices depend on make and model.

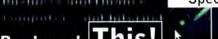
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#### Bookmark 1

### ienware Systems Offer Extraterrestrial Performance



#### www.alienware.com

If extra-terrestrials looking for high-performance PCs approach you with the order, "Take me to your leader," you'd do well to guide them to Alienware Corporation. Just look at some of the comments customers have posted on Alienware's web site:

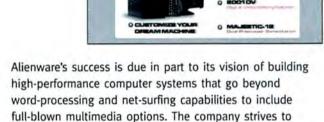
"I just want to thank you for such a well-built product," says Marty. "My new Area 51 computer is truly 'all that and a bag of chips.'... I will be referring your excellent company to my friends who are looking for a computer system that is a cut above the rest."

Another user, David Shor, writes, "Thank you, guys, for building the best system money can buy! There are no false claims about performance level. The machine I got from you just smokes."

"Alienware, you are supreme," gushes Jack Powell. "I am now on my second Alienware system .... I fell in love with the first and am now in love with this one. There is no better-built computer on the market, and the components are absolutely cutting-edge.... I wouldn't consider buying a computer system from someone else."

"I have never had the pleasure of using a machine that was built to such perfection," Mario Viscardi adds. "The speed of the machine is amazing!"

Users aren't the only ones enthusiastic about Alienware's computer systems. "Alienware's top-of-the-line system packs a lot of brand-name punch into a reasonably priced package," writes PC Gamer, which has given Alienware its Editor's Choice award every year for the past three years. Alienware also won Maximum PC's "Kick-Ass Award" and was described by that magazine as "the fastest PC we've ever seen, bar none!"



use the latest 3D accelerators and the best hardware possible, allowing users to customconfigure their systems by choosing the best brand-name components.

The South-Florida-based company, which was recently named a Microsoft System Builder Gold Member, prides itself on its customer service and support, which is also praised by its customers.

"The minute I began talking to your service reps, I knew I was in good hands," explains Michael Cooke. "They made me feel confident in the product I was purchasing, offered suggestions, and gave their input on the hardware.... Keep up the good work and keep setting the standards for what should be expected from any company."

Abraham Egnor says, "I love you guys. I sent you a message about losing the Software DVD player. I expected to get a reply sometime this week, maybe asking me for more info. Instead I got a reply the next day, with the software attached. Two words: jaw droppage. And it works. I'm not used to things going this well, especially where computer problems are concerned."

High performance, service, and support. It's no wonder many consider Alienware "out of this world." >

#### MD Duron 700MHz Processor

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-CNET Editor's Choice Award











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TheBancorp.com is not the largest financial institution in the world, but on the Web, it can take on just about any bank. The Web site offers FDIC-insured checking accounts, online bill payment, car loans, and other options to individuals and businesses-all with just 70 employees in its Delaware and Pennsylvania offices. Until recently, while TheBancorp was extending a warm hand to its online customers, the bank itself was getting the cold shoulder from B-to-B marketplaces that have shunned small and midsize businesses.

Pete Chiccino, TheBancorp's vice president for networking and security, had already been cultivating a strong, long-standing friendship with firstsource.com, which builds B-to-B e-commerce solutions for small and midsize companies and Internet resellers. When firstsource announced its new e-procurement service, firstsourceconnect, Chiccino made sure TheBancorp would be among the first companies to try it. "Because of our excellent track record with firstsource," he says "we figured that this new service deserved a closer look. As it turns out, connect was a perfect match for our procurement requirements."

firstsourceconnect streamlines and economizes purchasing: it reduces paperwork and research, operation costs, and purchase cycle time. It also tightens controls over employee purchases and eliminates so-called "maverick" buying problems. TheBancorp uses connect to gauge product prices and availability, customize its pricing templates and billing reports, establish budgets, and enforce workflow procedures. Chiccino uses connect to sign off on purchases initiated by any of TheBancorp's 70 employees. "Every time someone places an order, I automatically receive an e-mail through connect, requesting my approval," he explains. "I can then respond with an approval, or send the purchaser an explanation of why I am declining the purchase."

#### firstsourcecorp Business Purchasing, Made Smart.

Through connect, TheBancorp has 24x7 access to firstsource's massive knowledge base, featuring more than 1.2 million products and services in ten categories, including computer hardware and software, consulting, and financing services. And firstsource saves TheBancorp time and money with real-time stock status information (no surprise back-order delays), and lists of top-selling items and weekly specials. "We're always able to buy everything from print consumables to computers in one place, and at an excellent price," Chiccino says.

While connect relies on firstsource's proprietary FSP platform, inpowr, to join TheBancorp with multiple B-to-B product distributors, the connection is nearly transparent for connect users, firstsource customized TheBancorp's portal to blend seamlessly with its own internal procurement systems. "firstsource matched the look and feel of our own Web pages almost exactly," says Chiccino. firstsource can configure and launch new customized client portals within 15 days. Since the portals are Web-based, updates occur on the client side automatically-no new downloads and reconfigurations are required.

Chiccino thinks that connect is the next evolutionary step in firstsource's support for small and midsize clients. "We're used to receiving a high level of customer service from our firstsource account executive," he says. "And connect is an extension of that service. We will now be doing most of our procurement over the Web, but we'll still have access to real service representatives for technical assistance, or when we want to make changes to our ordering system." >

# Avoid white collar crime.

# Don't spend \$158 for an \$8 stapler.

Fact: Your company can actually spend more on the process of buying its business products than on the products themselves. But it doesn't have to. We'll build you an online Purchasing Center that automates and streamlines every aspect of your company's buying. So you'll save time, money, and effort. Learn more. Call 800.815.9866. And save the frivolous spending for the client lunches.

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# PC WORLD

# TOP 100

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CLOSING

Neoclassical Art and

CAP

INSPIRING SPEED: With a
PIII-850 CPU, Deli's Inspiron 8000
notebook leaves many desktops in the dust.

#### ULTIMATE HIGH-TECH > BUYING GUIDE

THE PERFORMANCE GAP between desktop and notebook systems is rapidly closing. It used to be that the only choice for a system with serious number-

crunching capabilities was a desktop machine, but some notebooks now carry extremely fast processors. This month's notebook chart marks the debut of the speediest mobile CPU to date: Intel's 850/700-MHz Pen-

HOME CHART

spot next month.

tium III SpeedStep processor. Two new notebooks based on this chip-the Dell Inspiron 8000 and the Dell Latitude C600-grab the first two spots in the power section of the Top 15 Notebook PCs chart. Both achieved an Outstanding performance rating running at the 850-MHz speed, with PC WorldBench 2000 scores of 167 for the Inspiron and 169 for the Latitude; these scores beat those posted by all other notebooks and by many systems on our Top 30 desktops charts.

Despite its impressive power, the new CPU ON HIATUS: The Top 15 doesn't unduly tax the Home PCs chart has been battery. Both Dell lapsuperseded by this month's comtops managed Good prehensive roundup of home sysratings for battery life, tems on page 135. The Home PCs each lasting just unchart will be back in its usual der 3.5 hours on one charge. On battery power, the processor steps down to the speed of 700 MHz; plugged into a power supply, it cranks up to 850 MHz. Unfortunately, these powerful systems also have steep prices: \$3646 for the Inspiron, and \$3527 for the Latitude, saddling them with Expensive ratings.

PRICE POINTS CHANGE

THIS MONTH WE'VE tweaked the price ranges for the desktop systems in our Top 10 power, midrange, and budget PCs charts. To account for inflation, we've



POINT YOUR browser to www. pcworld.com/top400 for lateonline breaking reviews of desktop com-

puters. In the Top 400 section, you'll find comprehensive reviews and ratings. You'll also find details on the PC WorldBench 2000 test suite at www.pcworld.com/benchmark.

raised the top price for a budget system from \$1199 to \$1399; systems that cost between \$1400 and \$2399 land on the midrange chart. Anything above \$2400 goes onto the power chart.

#### IT'S NOT ABOUT ME

THOUGH WINDOWS Millennium Edition, egocentrically dubbed Me, may be the latest and greatest operating system for consumers, it's unlikely to take hold in

the corporate market anytime soon. Some vendors have decided to ship their sys-

tems with Windows Me (such as the Polywell Poly 830KX-750D, which comes in at seventh place on the budget chart), but others are sticking with Windows 98 Second Edition for their corporate models-at least for now.

Dell, for example, says it will continue to ship Windows 98 SE on all business desktops that don't ship with

Windows NT or 2000. "We still have a fairly robust attach rate [demand] for Windows 98 for the entry-level corporate and small-business users," says company spokesperson Anne Camden.

Though Dell plans to offer mostly Windows 98 SE systems in the business segment until Microsoft releases the followup OS to Millennium, it will release one Windows Me system for the office: the OptiPlex GX150. "It represents our mainstream desktop market-it will be the best business option for customers that decide they do want Millennium," Camden says.

Until then, the likeliest place to see systems running on Windows Me is in the Top 15 Home PCs chart. We review this month's home systems in the roundup on page 135; of the 15 systems in the roundup, 10 run on Windows Me.

Contributing writers Richard Jantz, Dan Littman, Joel Strauch, and Carla Thornton, along with PC World editors Richard Baguley, Lisa Cekan, Mick Lockey, Kalai Murugesan, Kalpana Narayanamurthi, Karen Silver, and Alan Stafford contributed to the articles appearing in this month's Top 100. Testing was performed by Curtis Buehler, Ulrike Diehlmann, Robert James, Elliott Kirschling, Jeff Kuta, and Thomas Luong of the PC World Test Center. See page 16 for contact information.

# YOUR GUIDE TO THE TOP 100

QUESTIONS ABOUT OUR CHARTS? The following information should answer them.

How do the charts work? Each month we test a large number of PCs, printers, scanners, monitors, graphics boards, and CD-RW drives, and compare them with previously reviewed products. Only the best products land on the Top 10 and Top 15 charts, which are refreshed monthly. System configurations are shown as tested. Vendors may have since changed components.

What does the overall rating mean? This 100-point scale reflects results from our hands-on evaluations and performance tests. A score in the 90s is exceptional, while one in the 70s is above average.

What does the PC WorldBench 2000 score mean? It's a measure of how fast a PC can run a mix of common business applications as compared with our baseline machine, an HP Pavilion 8380 with a PII-400 CPU, 96MB of RAM, and an 8GB hard drive. For example, a PC that scores 200 is twice as fast as the baseline system.

Where do the scores for reliability, support quality, and support policies come from? Reliability and support quality scores are based on surveys of PC World readers and on anonymous support calls made by PC World staff. The policies score is based on

vendor support policies.

# TOP 10 POWER PCs

	SYSTEM: \$2400 AND OVER	Month tested	★ Overall rating	Street price (9/15/00)	PC WorldBench 2000 Paster performance score	Base configuration
1	Dell OptiPlex GX300 800/388-8542 www.dell.com	Nov 00	98	Inexpensive: \$2629	Good 179	Outstanding: Pentium III-866, 128MB of RDRAM, 256KB L2 cache, 20GB hard drive, 19-inch monitor, Windows 2000 Professional
2	Dell Dimension XPS B1000r Special Edition 800/388-8542 www.dell.com	Aug 00	96	Average: \$2999	Good 178	Outstanding: Pentium III-1000, 128MB of RDRAM, 256KB L2 cache, 40GB hard drive, 19-inch monitor, Windows 2000 Professional
3	Gateway Select 1000 800/315-2536 www.gateway.com	July 00	95	Very inexpensive: \$2439	Good 155	Very good: Athlon-1000, 128MB of SDRAM, 512KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
4	Sys Performance 1100T 800/613-9963 www.sys.com	NEW	92	Average: \$2785	Outstanding 229	Outstanding: Athlon-1100, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows NT 4.0
5	HP Vectra VL400 800/752-0900 www.hp.com/desktops	Oct 00	90	Inexpensive: \$2569	Very good 188	Outstanding: Pentium III-933, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 2000 Professional
6	Micron ClientPro Cn 800/642-7667 www.micronpc.com	Oct 00	90	Inexpensive: \$2654	Good 158	Satisfactory: Pentium III-933, 128MB of SDRAM, 256KB L2 cache, 15GB hard drive, 17-inch monitor, Windows 98 SE
7	Premio Apollo 820R 800/677-6477 www.premiopc.com	NEW	90	Average: \$2795	Outstanding 168	Outstanding: Pentium III-1000, 128MB of SDRAM, 256KB L2 cache, 41GB hard drive, 19-inch monitor, Windows 98 SE
8	Tangent Medallion ProDV 800/800-5550 www.tangent.com	Nov 00	85	Average: \$3095	Very good 184	Outstanding: Pentium III-1000, 256MB of SDRAM, 256KB L2 cache, 46GB hard drive, 19-inch monitor, Windows 2000 Professional
9	Polywell Poly K7-1000A 800/999-1278 www.polywell.com	Oct 00	82	Expensive: \$3250	Outstanding 169	Outstanding: Athlon-1000, 256MB of SDRAM, 256KB L2 cache, two 40GB hard drives, 19-inch monitor, Windows 98 SE
10	Kingdom Royale PIII-933 800/385-3436 www.kingdom.computers.com	Sept 00	74	Very expensive: \$3750	Good 171	Good: Pentium III-933, 128MB of SDRAM, 256KB L2 cache, 27GB hard drive, 15-inch LCD monitor, Windows 2000 Professional
	Best Buy	Percent of overal	I rating >	Price: 15 percent	Performance: 20 percent	Base configuration: 10 percent

A system's performance word score is relative to the scores earned by other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 223.



IT'S A LIVE ONE: We tested an Athlon 1.1-GHz system this month, and it turns out to be a barn burner. Sys Technology's Performance 1100T nails fourth place on the

power chart with the highest score we've seen on our PC WorldBench 2000 tests. Our other new Top 10 system—Premio's Apollo 820R proves no slouch either, landing at number seven with a PIII-1 GHz at its core and carrying an impressive array of multimedia components.

#### 1 DELL OPTIPLEX GX300



WHAT'S HOT: Thanks to a huge, \$693 price cut, this Pentium III-866 system moves up a notch to

top the chart. The OptiPlex GX300 earned a respectable PC WorldBench 2000 score of 179—about 5 percent above the average for similarly configured systems running Windows 2000 Professional. Opening the wide midsize tower case proves simple, using a release button on the front of the system. A swing-out power supply allows easy access to the three open, toolfree drive bays, and the five open PCI slots are totally clear of obstructions. Dell's 19inch UltraScan P991 monitor produces bright, rich colors and crisp text at all resolutions short of astronomical.

WHAT'S NOT: The system comes with RDRAM (128MB of it), which means that future memory upgrades won't be cheap. Unfortunately, the performance benefits of RDRAM aren't that impressive. Our August story "Money for Nothing? Rambus Performance Falls Short" notes only a very slight speed increase for RDRAM over PC133 SDRAM (see www.pcworld. com/aug2000/rambus).

WHAT ELSE: The bundled Microsoft Natural Keyboard enables comfortable, smooth, and quiet typing, while the 8X/4X/32X CD-RW drive adds a backup option. A case lock, chassis-intrusion detection, a network interface card (with Wake-on-LAN), and the included Open-Manage Client remote-administration software round out the corporate features. BEST USE: For businesses that want fast, managed Windows 2000 systems, the OptiPlex offers substantial power, especially considering the lower price.

#### 2 DELL DIMENSION XPS B1000R SPECIAL EDITION



WHAT'S HOT: This PIII-1000 Dell system produced a strong score of 178 on our PC WorldBench 2000

We define vertical cases as towers (taller than 20 Inches), midsize towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than

Extra features	Design and expandability <sup>2</sup>	Vendor's system reliability	Tech support quality/ policies	Tech support (hours/days, charge)	Warranty for parts/labor (years)
Very good: Dell NVidia GeForce+ NVIO graphics card with 32MB of SDRAM, 8X/4X/32X CD-RW drive, network card, Microsoft Natural Keyboard, OpenManage Client, case lock	Good: hard to remove case; midsize tower; 3 open drive bays, 5 open slots	Outstanding	Good/ Outstanding	24/7, toll-free	3/3
Outstanding: Dell NVidia GeForce 256 graphics card with 64MB of DDR SGRAM, 12X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem, network card, Microsoft IntelliMouse	Good: lots of expansion room; midsize tower; 3 open drive bays, 2 open slots	Outstanding	Good/ Good	24/7, toll-free	3/1
Outstanding: Creative Labs NVidia RIVA TNT2 graphics card with 32MB of SDRAM, 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem, microphone	Good: cramped interior; midsize tower; 4 open drive bays, 3 open slots	Good	Fair/ Outstanding	24/7, toll-free	3/3
Good: Matrox Millennium G400 dual-head graphics card with 32MB of SGRAM, 8X/4X/32X CD-RW drive, network card	Very good: cluttered but roomy case; mid- size tower; 5 open drive bays, 3 open slots	i	Good 3/ Good	24/7, 4 toll-free	Varies 1/5
Good: Matrox Millennium G400 dual-head graphics card with 16MB of SGRAM, 4X/4X/32X CD- RW drive, network card, HP EDiagTools and Protect Tools 2000 administration software	Good: easy to access memory; midsize tower; 2 open drive bays, 5 open slots	Good	Fair/ Good	24/7, toll-free	3/3
Good: VisionTek NYIdia RIVA M64 graphics card with 32MB of SDRAM, 20X-48X CD-ROM drive, network card, Microsoft Office 2000 SBE, LANDesk, chassis-intrusion detection, case lock	Good: tool-free case removal; midsize tower; 5 open drive bays, 5 open slots	Good	Fair/ Outstanding	24/7, toll-free	Varies 1/1
Very good: ELSA Gladiac-32 graphics card with 32MB of SGRAM, 12X DVD-ROM drive, BX/4X/32X CD-RW drive, network card, Microsoft Office 2000 SBE	Good: roomy case; midsize tower; 4 open drive bays, 3 open slots	ja ((	Fair '/ Fair	10/5, toll-free	3/3
Very good: Leadtek WinFast 3D GeForce 256 DDR graphics card with 32MB of DDR SGRAM, BX DVD-ROM drive, network card, lomega Zip 250 drive, Corel WordPerfect 2000	Good: lots of expansion room; midsize tower; 3 open drive bays, 3 open slots		Poor '/ Good	24/7, toll-free	3/3
Very good: Leadtek Winfast 3D GeForce 256 graphics card with 32MB of DDR SGRAM, IZX DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem, Corel WordPerfect Office 2000	Satisfactory: cordless mouse; midsize tower; 2 open drive bays, 3 open slots	i	Fair <sup>3</sup> / Good	24/7, toll-free	3/5
Very good: Cardex NVidia TNT2 M64 graphics card with 32MB of SDRAM, 40X-52X CD-ROM drive, LS 120 drive, V.90 modem, Microsoft Office 2000 Professional, McAfee VirusScan	Good: good expansion possibilities; midsize tower; 3 open drive bays, 4 open slots		Good <sup>3</sup> / Fair	12.5 °/6, toll-free	Varies 7/1
Extra features: 10 percent	Design and expandability: 15 percent	Reliability: 15 percent	Support a	and warranty: 15 p	percent

Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs. For tech-support quality, this rating may also depend on our anonymous support-quality calls.

Support hours drop to 9 hours M-F after one year.

Six years on CPU and main RAM, three years on other parts.

Nine hours on Saturday.

Five years on CPU and main RAM, three years on other parts.

tests. The system also sports both a 12X DVD-ROM drive and an 8X/4X/32X CD-RW drive, and its Dell NVidia GeForce 256 graphics card with DDR memory offers both analog and digital video output. That output looks very nice indeedthe 19-inch UltraScan P991 flat-screen CRT delivers richly saturated colors and ultrasharp text, even at resolutions higher than the standard 1280 by 1024.

WHAT'S NOT: Despite a \$220 price drop, you'll still pay a substantial \$2999 for the privilege of having speed and top-notch components. You could buy both Top 10 Budget PCs' Best Buys for this Dell's price. WHAT ELSE: Getting the midsize tower up and running is a snap, thanks to Dell's detailed setup guide and well-labeled rear ports. The huge reference-and-troubleshooting manual houses tons of detailed information. Dell includes a microphone as well as Microsoft Office 2000 Small Business Edition for its price as config-

ured. The side of the case slides off easily after you release two latches, making access to the inside of the system quick and painless. The fairly cluttered interior offers two open PCI slots and three open drive bays for future expansion. A handsome Harman Kardon HK595 three-speaker set with subwoofer pumps out wellrounded sound and highlights the multimedia features.

BEST USE: This Dimension will please those who are looking for the speediest, most tricked-out 1-GHz system available.

#### New on the Chart

#### 4 SYS PERFORMANCE 1100T

NEW WHAT'S HOT: You'll be hardpressed to find a faster machine this side of a Cray Supercomputer, which would cost you significantly more than the \$2785



Performance 1100T has speed to burn.

Sys wants for this system. With a 1.1-GHz Athlon, the Performance 1100T earned a 229 on our PC WorldBench 2000 tests (though systems running Windows NT score higher in PC WorldBench tests than similarly configured systems running Windows 2000 or Windows 98 SE). >



BLAST OFF: Premio's Apollo 820R relies on a PIII-1000 to post a PC WorldBench score of 168.

The Sys uses a dual-head Matrox Millennium G400 graphics board, which can drive two monitors at once. The 19-inch ViewSonic PF790 monitor delivers rich colors and sharp text with only a slight blur at 1600 by 1200 resolution.

WHAT'S NOT: Sys supplies no overall system manual, though it does forward the documentation provided by its component manufacturers. No software comes bundled at this price.

WHAT ELSE: You must extract two screws to access the interior, but the sturdy side of this basic midsize tower slides on and off smoothly. The fairly cluttered interior boasts ample expansion room, with three open PCI slots and five open bays. The 8X/4X/32X CD-RW drive is a nice extra, though it's not the fastest available. The Sys keyboard permits smooth typing, but it's clacky and has an annoyingly small <Backspace> key.

BEST USE: Brag to your friends that you've got the only faster-than-1-GHz processor that hasn't been recalled.

#### 7 PREMIO APOLLO 820R

NEW WHAT'S HOT: Powered by a 1-GHz Pentium III, the Apollo 820R's PC WorldBench 2000 score of 168 is 3 points above the average for similarly configured systems we've tested. An 8X/4X/32X CD-RW drive, a 12X DVD-ROM drive, a network interface card, and Altec Lansing's ACS54W fivespeaker set are included. Microsoft

Office 2000 Small Business Edition anchors the software bundle.

WHAT'S NOT: In our anonymous calls to Premio's tech support, we received only Fair service. No weekend or evening tech support is available.

WHAT ELSE: The \$2795 price is about average for power systems based on the 1-GHz PIII. Though you must remove two screws to reach the interior of the basic midsize tower, the sturdy sides slide on and off smoothly on guide rails. Inside, neatly bundled cabling gives you easy access to the three open PCI slots and four open drive bays. The 19-inch Premio Elite 901 monitor delivered faded colors; text blurred only at 1600 by 1200 resolution. The Microsoft Internet Keyboard allows smooth, quiet typing and provides programmable Web-access buttons.

BEST USE: This powerful system with flexible networking features would fit well in a small office that's looking for maximum performance.

#### Also of Note

INTEL'S FORTHCOMING Pentium 4 will help to overshadow the quiet recall of its 1.13-GHz processors due to hardware conflicts (see "Intel's Sorry Season," page 64). Meanwhile, rival AMD delivered a beyond-1-gigahertz CPU of its own, a 1.1-GHz Athlon. This new chip uses an integrated 256KB Level 2 cache to speed performance substantially compared to the 512KB off-die L2 cache on older Athlons.

Our testing proved the Athlon's performance gains. The Sys Performance 1100T earned the highest PC WorldBench 2000 score we've seen-a 229. It is worth remembering that systems running Windows NT get higher PC WorldBench 2000 scores than those running Windows 98 or Windows 2000, and that we adjust the overall score to take this into account (systems always compete against other similarly configured systems). Nevertheless, it's a seriously speedy system.

The recall of Intel's 1.13-GHz PIII had vendors yanking systems off their Web sites and store shelves, but the next few months will see Intel competing again for the lead in the speed stakes. We'll have some of the first Pentium 4-armed systems to put through their paces.

#### Smart Cards: A PC for Your Eyes Only?

TECH TREND A SCREEN-SAVER password isn't going to cut it much longer. With federal and corporate laptops and desktop systems disappearing from sight faster than the mints in the Denny's front-desk basket, it's clear that stronger security measures are in order for some users. One solution: Smart Card readers. These hardware add-ons require a user to insert a plastic card (that they carry with them) and enter a PIN number before

gaining access to their PC. Without the Smart Card and the correct PIN no one can access the system-even if the machine is stolen, the thief can't get at the data on it.

The HP Vectra VL400, number five on our power chart, offers Smart Card security as an option, but even if you don't purchase the



feature preinstalled, third-party companies such as E-Z Lock and Rainbow Technologies provide add-on security accessories. Rainbow's tiny IKey plugs in via a USB port and fits discreetly on a keychain.

"Security is such a huge issue right now," says Jay Srivatsa, a senior analyst at the research firm Dataquest. Srivatsa says we will be seeing a wide variety of security options, including fingerprint scanners, voice-recogni-

tion systems, and even retinal scanners in the coming years.

"There are a whole bunch of opportunities [for security companies]-everything about security is still in its infancy," he says. "There will most likely be a shakeout where one or two of these recognition systems will become dominant."



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#### • 21" / 19.8" VIS

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- 4+1 USB power hub
- BNC connectors
- TC099

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- 0.22mm horizontal dot pitch
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TC099

- Full 18.1" TFT Active Matrix Flat Panel
- True 1280 X 1024 SXGA resolution
- 160° horizontal & vertical viewing
- Dual analog input
- 4+1 USB power hub
- Tilt and swivel stand
- TCO95, Energy Star®, VESA DPMS™













# TOP 10 MIDRANGE PCs

		Vent	*	Charat price	PC WorldBench 2000	
	SYSTEM: \$1400 TO \$2399	Month tested	Overall rating	Street price (9/15/00)	performance score	Base configuration
1	Dell Dimension 4100 800/388-8542 www.dell.com	Oct 00	94	Inexpensive: \$1719	Very good 154	Very good: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
2	Gateway GP7-800 800/315-2536 www.gateway.com	June 00	91	Inexpensive: \$1679	Outstanding 156	Outstanding: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
3	Compaq Deskpro EX 800/345-1518 www.compaq.com	Nov 00	91	Inexpensive: \$1705	Outstanding 193	Outstanding: Pentium III-733, 128MB of SDRAM, 256KB L2 cache, 15GB hard drive, 19-inch monitor, Windows NT 4.0
4	NuTrend Athlon Ultra 2 888/482-6678 www.nutrend.com	Nov 00	87	Average: \$1799	Very good 151	Outstanding: Athlon-900, 128MB of SDRAM, 512KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
5	Xi Computer K1000 MTower 800/432-0486 www.xicomputer.com	Nov 00	87	Expensive: \$2399	Outstanding 171	Outstanding: Athlon-1000, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
6	Sys Performance 733 800/613-9963 www.sys.com	Nov 00	85	Inexpensive: \$1628	Very good 169	Very good: Pentium III-733, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 17-inch monitor, Windows 2000 Professional
7	Polywell Poly 800K7 800/999-1278 www.polywell.com	May 00	83	Average: \$1995	Very good 151	Outstanding: Athlon-800, 128MB of SDRAM, 512KB L2 cache, 27GB hard drive, 19-inch monitor, Windows 98 SE
8	HP Vectra VL400 800/752-0900 www.hp.com/desktops	NEW	82	Average: \$1908	Good 165	Good: Pentium III-733, 128MB of SDRAM, 256KB L2 cache, 15GB hard drive, 17-inch monitor, Windows 2000 Professional
9	Systemax Venture PVO-TIO 800/262-6622 www.systemaxpc.com	NEW	80	Expensive: \$2349	Very good 170	Outstanding: Pentium III-1000, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 2000 Professional
10	IBM NetVista A40 800/426-2968 www.ibm.com/pc	NEW	79	Average: \$1889	Very good 145	Very good: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
	Best Buy	Percent of overa	all rating >	Price: 17 percent	Performance: 18 percent	Base configuration: 10 percent

A system's performance word score is relative to the scores earned by other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 223.



WITNESS A FEW CHANGES atop our midrange chart: The Gateway GP7-800 jumps up a couple of notches to second place, and our new price range divisions move the Xi

Computer K1000 MTower over from the power chart. At number eight, HP's Vectra VL400 features an optional internal battery backup. Systemax's Venture PVO-T10 brings gigahertz power to the ninth spot, and the number ten IBM NetVista A40 offers boot-level password protection.

#### DELL DIMENSION 4100

WHAT'S HOT: The Dimension 4100 scored a healthy 154 on our PC WorldBench 2000 tests, 4

percent above average for its Pentium III-800EB processor class. The system has several useful extras not often found at this midrange price, including the top-ofthe-line NVidia GeForce2 graphics board and a 17-inch Dell M780 monitor, which delivered vibrant colors and sharp text (albeit with some blur at the maximum

resolution of 1280 by 1024). In surveys of PC World readers, Dell receives high marks for reliability.

WHAT'S NOT: The Dimension costs \$60 less this month, but you'll still have to pay for some extras: Dell left out both a CD-RW and a DVD-ROM drive.

WHAT ELSE: A large reference-and-troubleshooting guide provides lots of detailed system information, and a setup poster makes putting this PC together a snap. But even with thumbscrew access, removing the side panel of this lanky midsize tower takes some work. Though a bit cluttered, the interior offers three open PCI slots and four open bays for expansion.

BEST USE: With excellent performance for the price, this Dell would fit well into almost any office.

#### **2** GATEWAY GP7-800



WHAT'S HOT: An \$84 price cut helps propel this system from last month's fourth place up to sec-

ond. A sizzling PC WorldBench 2000 score of 156 is 5 points above the average for similarly configured PIII-800EB systems. The gargantuan tower offers lots of room for expansion.

WHAT'S NOT: For the system's \$1679 price, we would have liked to see a DVD-ROM or CD-RW drive, but it ships with a 17X-40X CD-ROM drive.

WHAT ELSE: Colors on the 19-inch Gateway EV910 monitor looked rich but a bit

<sup>&</sup>lt;sup>2</sup> We define vertical cases as towers (taller than 20 inches), midsize towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches).

Extra features	Design and expandability <sup>2</sup>	Vendor's system reliability	Tech support quality/ policies	Tech support (hours/days, charge)	Warranty for parts/labor (years)
Good: Dell NVidia GeForce2 GTS graphics card with 32MB of DDR SGRAM, 20X-48X- CD-ROM drive, Y.90 modem, Microsoft Office 2000 Professional	Good: plenty of expansion room; midsize tower; 4 open drive bays, 3 open slots	Outstanding	Good/ Good	24/7, toll-free	3/1
Good: VisionTek NVidia RIVA TNT2 graphics card with 32MB of SDRAM, 17X-40X CD-ROM drive, network card, Microsoft Office 2000 Small Business Edition, MS IntelliPoint Mouse	Good: easy access to memory; tower; 6 open drive bays, 3 open slots	Good	Fair/ Outstanding	24/7, toll-free	3/3
Good: Mitac NVidia M64 Pro graphics card with 16MB of SDRAM, 20X-48X CD-ROM drive, network card, Compaq Intelligent Manageability	Satisfactory: roomy interior; midsize tower; 2 open drive bays, 2 open slots	Good	Fair/ Good	24/7, toll-free	3/1
Very good: Creative Labs Annihilator Pro graphics card with 32MB of SGRAM, 10X DVD- ROM drive, V.90 modem, network card, Corel WordPerfect Office 2000	Very good: roomy, well-organized interior; midsize tower; 4 open drive bays, 4 open slots		Fair '/ Good	24/7, toll-free	3/lifetime
Good: Hercules 3D Prophet II GTS graphics card with 64MB of SDRAM, 16X DVD-ROM drive, V.90 modem, Corel WordPerfect Office 2000, Norton Utilities 2000	Good: well-organized case; midsize tower; 4 open drive bays, 1 open slot		Fair '/ Outstanding	24/7, toll-free	3/3
Good: integrated Intel 815E graphics with 4MB AGP display cache, 16X DYD-ROM drive, network card	Good: lots of expansion space; midsize tower; 5 open drive bays, 6 open slots	note:	Good '/ Good	24/7, 4 toll-free	Varies 1/5
<b>Very good:</b> VisionTek NY994 NVidia GeForce 256 AGP graphics card with 32MB of SDRAM, BX DVD-ROM drive, V.90 modem, Iomega Zip 100 drive	Good: cramped interior; minitower; 3 open drive bays, 3 open slots		Fair '/ Good	24/7, toll-free	3/5
Good: integrated Intel 815E graphics with UMA, 8X/4X/32X CD-RW drive, network card, HP EDiagTools and TopTools administration software, Wake-on-LAN, case lock	Good: easy access to memory; midsize tower; 2 open drive bays, 5 open slots	Good	Fair/ Good	24/7, toll-free	3/3
Very good: Creative Labs Graphics Blaster GeForce2 GTS graphics card with 64MB of SDRAM, BX/4X/32X CD-RW drive, V.90 modem, network card, Microsoft Office 2000 SBE	Good: plenty of expansion room; midsize tower; 3 open drive bays, 3 open slots		Fair 1/ Good	24/7, toll-free	Varies ³/3
Good: integrated Intel 815E graphics with UMA, 10X-24X CD-ROM drive, network card, Lotus SmartSuite 2000, Lotus Notes client, IBM ScrollPoint mouse	Satisfactory: case too small to use AGP slot; desktop; O open drive bays, 2 open slots	Good	Good/ Fair	24/7, toll-free	3/1
Extra features: 10 percent	Design and expandability: 15 percent	Reliability: 15 percent	Support a	nd warranty: 15 p	ercent

Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs. For tech support quality, this rating may also depend on our anonymous support-quality calls.

dark; text remained sharp up to the maximum resolution of 1600 by 1200. The system is simple to set up, with labeled, color-coded ports and a side panel that's easy to remove and reattach. The thick system manual contains helpful color illustrations, upgrading tips, and troubleshooting information.

BEST USE: For those who need performance and expandability, the GP7-800 won't disappoint.

#### New on the Chart

#### 8 HP VECTRA VL400

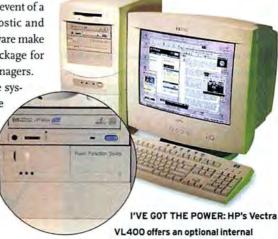
NEW WHAT'S HOT: Upgrading doesn't get any simpler-a handle lets you pop the side of the VL400 off easily, and the neat interior holds five open PCI slots and two open easy-load drive bays, both with toolfree access. Chassis-intrusion detection, an optional Power Protection Device (an internal battery backup that lets the sys-

tem shut down safely in the event of a power failure), and diagnostic and remote-administration software make the VL400 an attractive package for information technology managers.

WHAT'S NOT: At \$1908, the system ships without an office suite. While the performance of the integrated Intel 815E graphics is adequate for office environments, it isn't as capable as that provided by the high-end cards in many other systems.

WHAT ELSE: Colors on the HP71 17inch monitor looked a little washed out, though text appeared crisp except

for some slight blurring at the maximum resolution of 1280 by 1024. Powered by a Pentium III-733 and running Windows 2000 Professional, this Vectra earned a score of 165 on PC WorldBench 2000-



battery backup that occupies an external drive bay, so brownouts won't take down your system.

> average for similarly configured systems. BEST USE: As a basic workhorse that emphasizes multimedia less and security and management more, this Vectra fills corporate needs well.

Support hours drop to 9 hours M-F after one

Five years on CPU and main RAM, three years on other parts.

#### 9 SYSTEMAX VENTURE PVO-T10

NEW WHAT'S HOT: This Venture includes an 8X/4X/32X CD-RW drive for backup, a 64MB GeForce2 GTS graphics board, and Microsoft Office 2000 Small Business Edition. Add the flat-panel Monsoon MH500 three-speaker set and sharp text and colorful images on the Systemax DE-995FC 19-inch monitor, and you get impressive multimedia performance.

WHAT'S NOT: Our otherwise excellent test display was marred by a line that constantly scrolled up the screen; other systems with this monitor have not shown similar problems. The Venture earned a score of 170 on PC WorldBench 2000, 8 points lower than scores of other, similarly configured Windows 2000 systems.

WHAT ELSE: The side panel of the generic midsize tower opened easily with the



SOMETHING VENTURED: Systemax's Venture PVO-T10 is relatively inexpensive for a gigahertz system.

removal of only one screw, and the panel came off and went back on smoothly. The relatively neat and roomy interior offers three open PCI slots and three open bays for expansion.

BEST USE: The Venture PVO-T10 is suitable for any user who's looking for gigahertz prestige at a reasonable price.

#### 10 IBM NETVISTA A40

NEW WHAT'S HOT: The NetVista A40 comes in a smart desktop case that can also rest on its side as a minitower. Its excellent selection of corporate features includes a network interface,

IBM's Universal Manageability (which provides a range of remote-administration tools, such as auditing of components and chassis-intrusion alarms), a case lock, and boot-level password protection.

> WHAT'S NOT: This NetVista has four empty PCI slots, but because the case is so small, you can use only the two that are located on a riser card, and only short cards will fit. You can't use the AGP slot on the motherboard at all; you'll have to be satisfied with the integrated Intel 815E graphics.

WHAT ELSE: The Pentium III-800EB-equipped NetVista earned a PC WorldBench 2000 score of 145-4 points below the average for similarly configured systems running Windows 98 SE, though that difference shouldn't be noticeable. The IBM G76 17-inch monitor displayed



ANY COLOR YOU LIKE, as long as it's black: IBM's NetVista A40 is a corporate box with flair.

deep, rich colors, with clearly defined text that blurred only at the highest resolution of 1600 by 1200. Integrated audio and speakers provide acceptable performance for office environments.

BEST USE: The NetVista should appeal to corporate users, but the limited expansion options may discourage others.

#### MORE REVIEWS ONLINE



THE FOLLOWING SYSTEM didn't score high enough to reach the Top 10 Midrange PCs chart. For a

write-up, visit PCWorld.com (www.pcworld. com/t10pcs).

Axis Terra AXP

### New NVidia Geforce 2 MX Graphics Chip: A Business Graphics Solution?

TECH TREND YOU'VE PROBABLY never seen GeForce used in the same sentence as business before. But this won't be the last time. NVidia's latest graphics chip, the Ge-Force2 MX, provides excellent 3D performance coupled with features that fit right into the business environment.

One of these features is the Digital Vibrance Control, which NVidia says produces richer colors and sharper images, especially in poorly lit environments or the fluorescent-lit Hades where many cubicle dwellers spend their days.

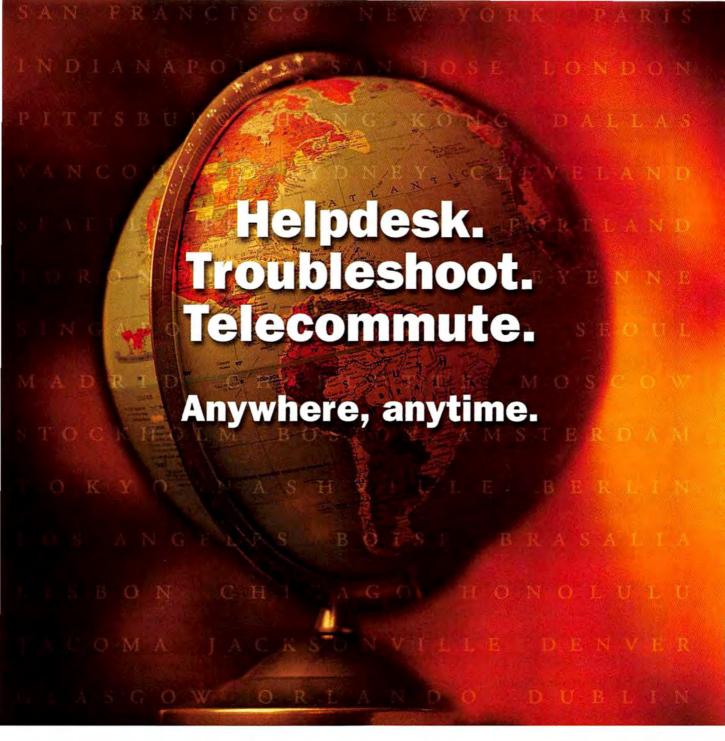
DVC also offers an intuitive software interface that makes it easy for users to adjust image intensity, brightness, and gamma settings. (which control how colors appear on the screen).

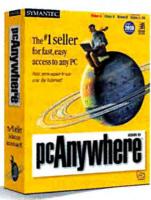


Boards using the MX start around \$149about half what high-end GeForce2 GTS gaming boards sell for. A \$199 version sports Twin-View, a dual-head display that lets one PC drive two monitors at once, with either a single big display tiled over the two screens, or two independent displays. For example, while one monitor displayed a Web page listing your competitor's prices, you could use the other to take notes in a word processing document.

GeForce2 MX cards use the all-inclusive Detonator graphics drivers, which make upgrades

a bit easier, because the same set of drivers works on any NVidiabased graphics card. Of course, the 32MB of SDRAM graphics memory will please noontime gamers, too.





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## TOP 10 BUDGET PCs

	SYSTEM: UNDER \$1400	Month tested	★ Overall rating	Street price (9/15/00)	PC WorldBench 2000 Faster performance score	Base configuration
1	Micro Express MicroFlex TB850 800/989-9900 www.microexpress.net	NEW	97	Inexpensive: \$1099	Outstanding 155	Outstanding: Athlon-850, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
2	Dell OptiPlex GX100 800/388-8542 www.dell.com	Sept 00	91	Inexpensive: \$1052	Satisfactory 111	Good: Celeron-600, 64MB of SDRAM, 128KB L2 cache, 10GB hard drive, 17-inch monitor, Windows 98 SE
3	NuTrend Athlon Special 2 888/482-6678 www.nutrend.com	Sept 00	91	Average: \$1169	Very good 140	Outstanding: Athlon-750, 128MB of SDRAM, 512KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
4	Sys TaskMaster 600D 800/613-9963 www.sys.com	Oct 00	90	Average: \$1195	Very good 159	Outstanding: Duron-600, 128MB of SDRAM, 64KB L2 cache, 20.5GB hard drive, 17-inch monitor, Windows 2000 Pro
5	NuTrend Sierra LE 888/482-6678 www.nutrend.com	Aug 00	89	Average: \$1199	Very good 142	Outstanding: Pentium III-733, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
6	ABS Multimedia VL 800/876-8088 www.buyabs.com	Aug 00	87	Average: \$1279	Very good 143	Outstanding: Athlon-700, 128MB of SDRAM, 512KB L2 cache, 20.5GB hard drive, 17-inch monitor, Windows 98 SE
7	Polywell Poly 830KX750D 800/999-I278 www.polywell.com	NEW	85	Average: \$1195	Good 134	Very good: Duron-750, 128MB of SDRAM, 64KB L2 cache, 20GB hard drive, 17-inch monitor, Windows Millennium Edition
8	Compaq Deskpro EXS 800/345-1518 www.compaq.com	Nov 00	84	Inexpensive: \$1090	Satisfactory 106	Good: Celeron-566, 64MB of SDRAM, 128KB L2 cache, 10GB hard drive, 17-inch monitor, Windows 98 SE
9	HP Brio BA 410 800/752-0900 www.hp.com/desktops	NEW	80	Average: \$1186	Satisfactory 132	Very good: Celeron-700, 128MB of SDRAM, 128KB L2 cache, 15GB hard drive, 15-inch monitor, Windows 2000 Pro
10	Toshiba V3300D 800/867-4422 www.shoptoshiba.com	NEW	78	Expensive: \$1324	Very good 138	Very good: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache, 150B hard drive, 17-inch monitor, Windows 98 SE
	Best Buy	Percent of overa	II rating 🕨	Price: 22 percent	Performance: 13 percent	Base configuration: 10 percent

A system's performance word score is relative to the scores earned by other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 223.



MICRO EXPRESS's MicroFlex TB850 debuts at number one this month. It's an impressive all-around package for a budget system, offering excellent performance. Polywell's

Duron-750-equipped Poly 830KX750D steps in at number seven, and HP's Brio BA 410 and Toshiba's V3300D take the final two slots.

#### 1 MICRO EXPRESS MICROFLEX TB850



WHAT'S HOT: This MicroFlex scores with expandability. To open the basic midsize tower, you

NEW remove a single thumbscrew from the back of the top panel and then smoothly slide out the sturdy side panel. A cavernous and very neat interior offers five open PCI slots and four open bays. Its spiral-bound system manual stays open while you work; the manual also contains an extremely handy list of manufacturers' tech support phone numbers and many illustrative screen shots.

WHAT'S NOT: Colors looked rich on the 17inch Impression 7VX monitor, but text grew fuzzy at just 1024 by 768 resolution and blurred heavily at the maximum resolution of 1280 by 1024. No business software came bundled with our test unit.

WHAT ELSE: Powered by an 850-MHz Athlon, this PC earned a respectable 155 on our PC WorldBench 2000 tests-one point below the only other Athlon-850 system running Windows 98 Second Edition that we've tested. Once you get used to it, the Microsoft Natural Keyboard allows smooth, quiet, and comfortable typing.

BEST USE: Any budget-minded small-

office buyer who's looking for solid performance and minimal preinstalled software should appreciate the \$1099 price.

#### 2 DELL OPTIPLEX GX100



WHAT'S HOT: Dell's OptiPlex GX100 wins kudos for its innovative design and corporate features,

including a slide-out riser board (for the easy addition of expansion cards), tool-free drive bay installation, and a swing-out power supply. With chassis-intrusion detection, a case lock, and an integrated network interface, this system is ready for any office with network management. The \$1052 price is pretty attractive, too.

WHAT'S NOT: The small system manual contains sparse information, and Dell provides no printed documentation for individual components. You'll find plentiful free documentation online, however.

WHAT ELSE: The Celeron-600 processor led this Dell to a score of 111 on our PC

<sup>&</sup>lt;sup>2</sup> We define vertical cases as towers (taller than 20 inches), midsize towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches).

Extra features	Design and expandability <sup>2</sup>	Vendor's system reliability	Tech support quality/ policies	Tech support (hours/days, charge)	Warranty for parts/labor (years)
Good: VisionTek NVidia GeForce2 GTS graphics card with 32MB of SGRAM, 8X DVD-ROM drive, V.90 modem	Very good: neat, spacious interior; midsize tower; 4 open drive bays, 5 open slots	*	Fair <sup>2</sup> / Outstanding	24/7, toll-free	4/4
Satisfactory: integrated Intel 810 graphics with UMA, 20X-48X CD-ROM drive, network card, chassis-intrusion detection, Wake-on-LAN	Satisfactory: sturdy case, easy access to memo- ry; midsize tower; 3 open drive bays, 4 open slots	Outstanding	Good/ Outstanding	24/7, toll-free	3/3
Good: Guillemot Maxi Gamer Cougar graphics card with 32MB of SDRAM, 10X DVD-ROM drive, Y.90 modem, network card, Corel WordPerfect Office 2000	Very good: neat interior; midsize tower; 4 open drive bays, 4 open slots	- 1	Fair */ Good	24/7, toll-free	3/lifetime
Good: Gigabyte GA-622 graphics card with 32MB of SDRAM, 17X-40X CD-ROM drive, network card	Good: no reset button; minitower; 2 open drive bays, 2 open slots	- 4	Good '/ Good	24/7,4 toll-free	Varies */5
Good: ATI Rage Fury Pro graphics card with 32MB of SDRAM, 8X DVD-ROM drive, V.90 modem	Good: detachable wrist rest; midsize tower; 4 open drive bays, 4 open slots	,	Fair '/ Good	24/7, toll-free	3/lifetime
Good: Guillemot/Hercules 3D Prophet DDR graphics card with 32MB of SGRAM, 40X-52X CD-ROM drive, V.90 modem, Corel WordPerfect Office 2000	Very good: roomy interior; midsize tower; 4 open drive bays, 3 open slots	2.	Fair '/ Fair	11/5, toll-free	3/lifetime
Good: Micro-Star MS-8808 graphics card with 32MB of SDRAM, 22X-48X CD-ROM drive, V.90 modem, Lotus SmartSuite 9.0 Millennium Edition	Good: cramped interior; midsize tower; 4 open drive bays, 2 open slots	,	Fair 1/ Good	24/7, toll-free	3/5
Good: integrated Intel 815 graphics with 4MB AGP display cache, 20X-48X CD-ROM drive, network card, Microsoft Office 2000 SBE, Compaq Intelligent Manageability	Satisfactory: tidy interior; compact; 2 open drive bays, 2 open slots	Good	Fair/ Good	24/7, toll-free	3/1
Good: integrated Intel 815E graphics with UMA, 17X-48X CD-ROM drive, network card, Microsoft Office 2000 SBE	Limited: swing-out power supply; minitower; 1 open drive bay, 2 open slots	Good	Fair/ Good	24/7, toll-free	3/3
Satisfactory: integrated S3 Savage 4 graphics with UMA, 17X-48X CD-ROM drive, network card, Norton Antivirus and Norton Internet Security, Wake-on-LAN	Satisfactory: crowded interior; desktop; 2 open drive bays, 2 open slots		Good 3/ Good	24/7, toll-free	1/1
Extra features: 10 percent	Design and expandability: 15 percent	Reliability: 15 percent	Support a	and warranty: 15 p	ercent

insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs. For tech-support quality, this rating may also depend on our anonymous support-quality calls.

Support hours drop to 9 hours M-F after one year. Six years on CPU and main RAM, three years on other parts.

WorldBench 2000 tests—reasonable performance for this CPU. Dell's standard midsize tower opens smoothly when you press a button on the front and pop off the side; inside are four open PCI slots and three unoccupied drive bays. The 17-inch Dell E770p monitor produced rich colors and sharp text, but 1024 by 768 is its maximum resolution, so this display is not the best choice for businesses that use graphics-intensive or CAD applications.

BEST USE: For the corporate buyer who's looking for high-end features and a lowend price, this OptiPlex fits the bill.

#### New on the Chart

#### 7 POLYWELL POLY 830KX750D

NEW WHAT'S HOT: Running Windows Millennium Edition and equipped with AMD's latest 750-MHz Duron CPU, the Polywell Poly 830KX750D earned a PC WorldBench 2000 score of 134. This sys-

tem is the first we've seen with that combination of OS and processor, so we can't rank its performance, but it is certainly very respectable for any budget model. Although you must tug off the entire bronze-painted case (rather than just a side panel) to access the interior, latches on each side make removal smooth. Polywell includes good manuals for the system as well as for the components.

WHAT'S NOT: The large, mid-1980sstyle keyboard is clacky and has an annoyingly small <Backspace> key. Color-coded ports on the rear of the system ease setup, but the stick-on

labels could easily fall off. In our anonymous calls to Polywell's tech support lines, we received only Fair service.

WHAT ELSE: The 17-inch Optiquest Q71 monitor displays rich colors and adequately sharp text at normal resolutions, but text blurred somewhat at the highest



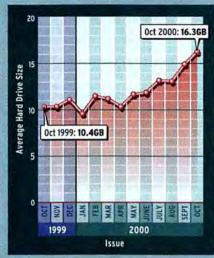
**DURON ROCKS ON: Polywell's Poly 830KX750D** contains a fast Duron processor and Windows Me.

resolution of 1280 by 1024. The software bundle includes Lotus SmartSuite 9.0 Millennium Edition. Despite the system's large case, expansion room is limited by the tiny motherboard to two open PCI slots and four open drive bays. And although that motherboard carries inte-

#### **Budget Hard Drives: More Space, Smaller Price**

TECH TREND WHILE AVERAGE system prices on our Top 10 Budget PCs chart generally stayed the same or dropped between October 1999 and October 2000, hard drive sizes mostly grew-and conspicuously. As the chart at right shows, the average hard drive size climbed from 10.4GB to 16.3GB-an increase of more than 50 percent in just 13 months.

More good news: While the newest and biggest drives (such as IBM's monstrous 75GB drive) have captured the headlines. we've also seen a distinct fall in the price per MB for hard drives. As a result, vendors can put bigger drives into their budget systems without passing along higher prices.



grated graphics, Polywell stuffed a 32MB NVidia TNT2 M64-based graphics card in the available AGP slot.

BEST USE: Small-office users looking for cheap speed should consider this system.

#### 9 HP BRIO BA 410

NEW WHAT'S HOT: This Brio contains corporate features not found on most budget PCs, including HP's EDiagTools diagnostic software, which provides help for system administrators (such as sending preboot diagnostic information over a network that can be used to find a problem even if the system won't start up). You don't need a toolbox to remove the cover or to install expansion cards.

WHAT'S NOT: This minitower offers only

one open drive bay in a cramped interior (though the swing-out power supply helps). The 15-inch HP D8896 monitor delivered chalky colors, and text began to get fuzzy at 1024 by 768 resolution.

WHAT ELSE: The Brio BA 410 is the first Celeron-700 system we've seen running Windows 2000, and it earned a satisfactory 132 on our PC WorldBench 2000 tests. Its system manual contains thorough troubleshooting and upgrading info. The package is bolstered by a network card and Microsoft Office 2000 Small Business Edition (but without the CDs). BEST USE: Targeted at small to mediumsize businesses, the \$1186 Brio BA 410 is a suitable choice for any company that's looking for an inexpensive, basic PC from

a name-brand vendor.

#### **10** TOSHIBA V3300D NEW WHAT'S HOT: This Toshiba

desktop model boasts several useful corporate features, like a case lock and a preinstalled Norton software bundle that includes Anti-Virus and Internet Security (but without the media). Business buyers will also appreciate the network card with Wake-on-LAN capability. WHAT'S NOT: Though armed with a Pentium III-800EB, the \$1324 Toshiba V3300D managed only a 138 on our PC WorldBench 2000

tests-a significant 11 points below the average for similarly configured Windows 98 SE systems. It also lacks a printed system manual, although the on-disk manual provides detailed information on the system and its components. The warranty for parts and labor extends for just one year-substantially shorter than the warranties offered by most other vendors.

WHAT ELSE: The desktop case seems generic, but it opens in a unique, somewhat-involved manner. To get to the two open PCI slots, you need only remove two thumbscrews and take off part of the case. To gain access to the rest of the interior, however, you must remove the two remaining thumbscrews and take off the rest of the case. It takes a bit of digging to get at the two open drive bays located beneath the already-installed drives. The 17-inch Toshiba TekBright 710V monitor produced vibrant colors, but text lacked crispness at normal resolutions and became quite blurry at the maximum resolution of 1280 by 1024.

BEST USE: This system's Wake-on-LAN and Norton software might be enticing, but its relatively slow performance and short warranty make it less of a bargain for business buyers.

#### Also of Note

THE GRAPHICS CARD in the Axis Terra DX7 carries NVidia's new budget graphics chip set, the GeForce2 MX. The MX offers some nifty business-appropriate features-and strong graphics performance-while keeping the cost down. (See the Tech Trend accompanying the Top 10 Midrange PCs chart for more details on this graphics chip set.) Unfortunately, in this system the MX sends its output to an inferior 17-inch Smile International monitor-which produces rich colors but almost unreadable text-keeping the system well off the chart.



BABY BRIO: The destined-for-cubicles HP Brio BA410 packs one of the first Celeron-700 CPUs we've tested.

#### MORE REVIEWS ONLINE



THE FOLLOWING SYSTEM didn't score high enough to reach the online Top 10 Budget PCs chart. For a

write-up, visit PCWorld.com/t10pcs.

Axis Terra DX7



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# TOP 15 NOTEBOOK PCs

2						
	POWER NOTEBOOK: \$2700 AND OVER	Month tested	★ Overall rating	Street price (9/15/00)	PC WorldBench 2000 performance score	Base configuration
1	Dell Inspiron 8000 800/388-8542 www.dell.com	NEW	91	Expensive: \$3646	Outstanding 167	Outstanding: Pentium III-850/700, 15-inch active screen, touch pad, eraserhead, 128MB of SDRAM, 20GB hard drive, Win 2000
2	Dell Latitude C600 800/388-8542 www.dell.com	NEW	90	Expensive: \$3527	Outstanding 169	Good: Pentium III-850/700, 14.1-inch active screen, touchpad, eraserhead, 128MB of SDRAM, 10GB hard drive, Windows 2000
3	IBM ThinkPad T20 800/426-7255 ext. 4751 www.ibm.com/pc/us	Sept 00	89	Average: \$3149	Satisfactory 136	Satisfactory: Pentium III-700/550, 14.1-inch active screen, eraserhead, 128MB of SDRAM, 12GB hard drive, Windows 98 SE
4	Gateway Solo 9300XL 800/846-2000 www.gateway.com	Sept 00	88	Average: \$3370	Good 145	Outstanding: Pentium III-700/550, 15.7-inch active screen, touchpad, 128MB of SDRAM, 20GB hard drive, Windows 2000 Pro
5	Acer TravelMate 737TLV 800/733-2237 www.acer.com	NEW	87	Inexpensive: \$2899	Satisfactory 132	Good: Pentium III-700/550, 15-inch active screen, touchpad, 128MB of SDRAM, 18GB hard drive, Windows 98 SE
	MIDRANGE NOTEBOOK: \$2000 TO \$2699	ercent of over	all rating >	Price: 14 percent	Performance: 20 percent	Base configuration: 5 percent
1	Dell Inspiron 4000 800/388-8542 www.dell.com	NEW	90	Expensive: \$2698	Outstanding 164	Outstanding: Pentium III-750/600, 14.1-inch active screen, touc pad, erasemead, 128MB of SDRAM, 20GB hard drive, Win 2000
2	HP OmniBook 6000 800/462-8947 www.hp.com	Sept 00	87	Average: \$2499	Good 129	Good: Pentium III-600/500, 14.1-inch active screen, touchpad, eraserhead, 64MB of SDRAM, 6GB hard drive, Windows 2000 Pr
3	Acer TravelMate 602TER 800/733-2237 www.acer.com/aac	Sept 00	86	Average: \$2400	Good 127	Very good: Pentium III-650/500, 13.3-inch active screen, touch pad, 128MB of SDRAM, 12GB hard drive, Windows 98 SE
4	Chem USA Chembook 8200B 800/866-2436 www.chemusa.com	Sept 00	85	Inexpensive: \$2059	Good 127	Satisfactory: Pentium III-650/500, 13.3-inch active screen, touchpad, I28MB of SDRAM, 6.4GB hard drive, Windows 98 SE
5	WinBook Si 800/128 800/965-9349 www.winbook.com	NEW	81	Average: \$2399	Very good 144	Good: Pentium III-800, 14.1-inch active screen, touchpad, 128Mi of SDRAM, 10GB hard drive, Windows 98 SE
-30	BUDGET NOTEBOOK: UNDER \$2000 P	ercent of over	all rating >	Price: 17 percent	Performance: 17 percent	Base configuration: 5 percent
1	IBM ThinkPad I Series 1230 800/426-7255 ext. 4751 www.ibm.com/pc/us	Oct 00	88	Inexpensive: \$1349	Good 104	Satisfactory: Celeron-500, 13-inch dual-scan screen, eraserhead, 64MB of SDRAM, 6GB hard drive, Windows 98 SE
2	Dell Latitude CPt S500ST 800/388-8542 www.dell.com	Oct 00	87	Average: \$1658	Very good 109	Satisfactory: Celeron-500, 12.1-inch active screen, touchpad, eraserhead, 64MB of SDRAM, 6GB hard drive, Windows 98 SE
3	Gateway Solo 1150cl 800/845-2000 www.gateway.com	NEW	86	Inexpensive: \$1399	Good 96	Satisfactory: Celeron-550, 12.1-inch active screen, touchpad, 64MB of SDRAM, 6GB hard drive, Windows Millennium Edition
4	Sceptre Soundx 7300 800/788-2878 www.sceptre.com	Nov 00	82	Expensive: \$1999	Very good 115	Good: Pentium III-600/500, 13.3-inch active screen, touchpad, 64MB of SDRAM, 6GB hard drive, Windows 98 SE
5	Compaq Armada 100S 800/345-1518 www.compaq.com	Nov 00	80	Average: \$1599	Satisfactory 85	Good: K6-2-533, 13.3-inch active screen, touchpad, 64MB of SDRAM, 5GB hard drive, Windows 98 SE
	Best Buy P	Percent of over	all rating >	Price: 20 percent	Performance: 14 percent	Base configuration: 5 percent



NOTHING SPARKS A DEBATE among notebook users like the simple question of which pointing device is bettertouchpad or eraserhead? Taking the high road, Dell has put

an end to the quandary by phasing out most of its touchpad-only notebooks and replacing them with a line of new dual-pointing portables.

Three of Dell's well-rounded new machines make impressive debuts on the Top 15 this month, claiming two of our Best Buys. The company's latest desktop-replacement machine, the \$3646 Inspiron 8000, is our new power champ. Its topflight processor, Intel's new Pentium III-850/700, helped the Inspiron 8000 go to the head of the class with a scorching PC WorldBench 2000 score of 167. The power chart's secondplace finisher, the Latitude C600, and our midrange Best Buy, the Inspiron 4000, both can accept any of eight interchange-

Extra features '	Design and ease of use	Battery life (hours:min)	Travel weight (pounds) ?	Vendor's system reliability	Tech support quality/ policies	Tech support (hours/days, charge)	Warranty for parts/labor (years)	
<b>Very good:</b> multipurpose bay, 8X DVD-ROM drive, built-in modem, NIC, IEEE 1394 port, Microsoft Office 2000 SBE	Outstanding: customizable color palm-rest panels and headphones with stereo sound	Good/ 3:24	Heavy/ 9.3	Good	Good/ Good	24/7, toll-free	3/3	
Good: multipurpose bay, 10X-24X CD-ROM drive, built-in modem and NIC	Very good: dual pointing devices and raft of extra-cost add-ins	Good/ 3:28	Average/ 7.7	Good	Good/ Good	24/7, toll-free	3/3	
<b>Very good:</b> multipurpose bay, 6X DVD-ROM drive, builtin modem and NIC	Very good: travel ThinkPad adds Bluetooth port and access to great electronic manual	Good/ 3:21	Light/ 6.5	Good	Good/ Fair	24/7, toll-free	3/3	
Very good: two multipurpose bays, 10X-24X CD-ROM drive, LS-120 drive, built-in modem and NIC	Outstanding: drive-in-movie-size screen dominates fast SUV of desktop replacements	Good/ 3:24	Heavy/ 9.6	Good	Fair/ Good	24/7, toll-free	3/3	
Good: multipurpose bay, 6X DVD-ROM drive, built-in modem and NIC, Microsoft Works 2000	Very good: holds a second hard drive, but DVD quality could be better	Outstanding/ 5:34	Average/ 8.2	Fair	Good 1/ Fair	24/7, toll-free	1/1	
Extra features: 5 percent	Design and ease of use: 10 percent	Battery life: 8 percent	Weight: 8 percent	Reliability: 20 percent	Support	and warranty: 10 p	ercent	
Good: multipurpose bay, 10X-24X CD-ROM drive, built-in modern, Microsoft Office 2000 SBE	Very good: great choice for sharing; optional color palm rests and case inserts dress up looks	Very good/ 4:10	Average/ 7.9	Good	Good/ Good	24/7, toll-free	1/1	
Good: multipurpose bay, 12X-24X CD-ROM drive, built-in modem and NIC	Outstanding: Bluetooth-ready; dual pointing devices; security Smart Card	Good/ 3:30	Light/ 6.8	Good	Good '/ Fair	24/7, toll call	3/3	
<b>Very good:</b> single multipurpose bay, 4X/2X/20X CD-RW drive, built-in modem and NIC, Microsoft Works 2000	Very good: LAN-ready lightweight with soft, quiet keyboard; CD-RW drive replaces floppy	Very good/ 4:21	Light/ 6.7	Fair	Good 3/ Fair	24/7, toll-free	1/1	
Satisfactory: multipurpose bay, 12X-24X CD-ROM drive, built-in modem and NIC	Satisfactory: takes fewer add-ins than other laptops, and modem requires extra cable	Very good/ 4:13	Light/ 6.3	1.0	Fair '/ Fair	24/7, varies *	1/3	
Satisfactory: 6X DVD-ROM drive, built-in modem	Satisfactory: boxy unit has Web and mail- launch buttons, uses desktop version of CPU	Satisfactory/ 2:57	Average/ 8.1	Fair	Good 3/ Fair	13/6, toll-free	3/3	
Extra features: 5 percent	Design and ease of use: 10 percent	Battery life: 8 percent	Weight: 8 percent	Reliability: 20 percent	Support	port and warranty: 10 percent		
Satisfactory: multipurpose bay, 10X-24X CD-ROM drive, built-in modem, NIMH battery, Lotus SmartSuite ME	Satisfactory: dual-scan screen a tad washed out; internal floppy drive not an option	Good/ 3:05	Light/ 6.8	Good	Good/ Fair	24/7, toll-free	1/1	
Good: multipurpose bay, 10X-24X CD-ROM drive, built-in modem	Outstanding: flexible; touchpad and eraser- head; bay holds any of eight devices	Satisfactory/ 2:02	Average/ 7.4	Good	Good/ Good	24/7, toll-free	1/1	
Satisfactory: 10X-24X CD-ROM drive, built-in modem	Satisfactory: boombox-worthy built-in speakers top off sleek IBook-inspired design	Satisfactory/ 2:27	Average/ 7.8	Good	Fair/ Good	24/7, toll-free	3/3	
Satisfactory: 10X-24X CD-ROM drive, built-in modem and NIC	Satisfactory: full set of ports; slice adds internal bays and IEEE 1394 ports	Good/ 3:07	Light/ 6.8	100	Good 3/ Fair	9/5, toll-free	1/1	
Satisfactory: 10X-24X CD-ROM drive, built-in modem, Microsoft Office 2000 SBE	Poor: basic and compact; nonremovable floppy and CD-ROM drives; so-so sound	Satisfactory/ 2:52	Average/ 7.6	Fair	Fair/ Fair	24/7, toll-free	1/1	
Extra features: 5 percent	Design and ease of use: 10 percent	Battery life: 8 percent	Weight: 8 percent	Reliability: 20 percent	Support	and warranty: 10 ;	ercent	

<sup>5</sup> Support toll-free from 8:30 a.m. to 5:30 p.m. PST; toll call at other times.

able devices in their multipurpose bay.

Dreaming of a laptop that delivers extralong battery life? The power chart's new \$2899 Acer TravelMate 737TLV ran for

#### L REVIEWS ONLINE



FOR DETAILED write-ups of all the new notebooks that we tested online this month, visit PCWorld.com (www.pcworld.com/top400).

5.5 hours on a single charge, a new record in our tests. First-time PC buyers will appreciate Gateway's new \$1399 Solo 1150cl, which features not only an IBook-esque appearance and a legacy-free case (one with no serial or parallel docking connection) but also great built-in speakers.

Contributing Editor Carla Thornton regularly covers notebooks for PC World.





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# TOP 10 PRINTERS

	INK JET PRINTER	Street price (9/22/00)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/color graphics	Cost per page for monochrome/ color (cents)	Comments
1	Lexmark Z32 Color Jetprinter 800/539-6275 www.lexmark.com	\$70	97	2.5/0.3	Good/ Good	7.1/20	FEATURES: Rated 7.5 ppm monochrome/3.5 ppm color. 1200 by-1200-dpi maximum resolution, 100 sheets input, 25 output SUMMARY: The 232 has impressive print quality for its \$70 pric producing clean text and rich, detailed images. Its performance slow, however, and consumables are costly.
2	Lexmark Z42 Color Jetprinter 800/539-6275 www.lexmark.com	\$129	94	4.5/0.5	Good/ Good	5.2/19.1	FEATURES: Rated 10 ppm monochrome/5 ppm color. 2400 by-1200-dpi maximum resolution, 100 sheets input, 50 ou put. SUMMARY: The 242 is one of the faster models on the chart feet, and it prints both text and color graphics smoothly and event Gray-scale images are not as impressive, however.
3	HP DeskJet 932C 800/752-0900 www.hp.com	\$199	94	3.6/0.7	Good/ Good	3.6/11.1	FEATURES: Rated 4.5 ppm monochrome/2 ppm color, 2400 by-1200-dpi maximum resolution, 100 sheets input, 50 ou put. SUMMARY: The 932C produces solid text quality, sharp grascale images, and detailed-if somewhat light-color graphics. Specis acceptable but not dazzling.
4	Lexmark Z52 Color Jetprinter 800/539-6275 www.lexmark.com	\$179	92	5.4/0.6	Very good/ Very good	5.2/19	FEATURES: Rated 15 ppm monochrome/7 ppm color. 2400 by-1200-dpi maximum resolution, 100 sheets input, 50 ou put. SUMMARY: The higher-end model in Lexmark's 2 line of ink jet produces sharp text and smooth images for a reasonable price. also prints text quickly.
5	Xerox DocuPrint M750 800/832-6979 www.xerox.com	\$149	92	4.2/0.8	Very good/ Good	5.9/17	FEATURES: Rated 10 ppm monochrome/6 ppm color. 1200 by-1200-dpi maximum resolution, 150 sheets input, 50 ou put. SUMMARY: With high text speed and crisp text quality, th M750 offers a lot for \$149. Other features, such as a large input trained a straight paper path, make it an even better bargain.
6	Lexmark Z12 Color Jetprinter 800/539-6275 www.lexmark.com	\$50	86	2.4/0.4	Good/ Adequate	7.1/12.9	FEATURES: Rated 6 ppm monochrome/3 ppm color. 1200-bi 1200-dpi maximum resolution, 100 sheets input, 25 outpu SUMMARY: Costing even less this month, the Z12 is cheapest in th Top 10, but sluggish text and graphics speeds and lack of a black in cartridge (it has a color ink cartridge only) pull it down.
7	HP DeskJet 842C 800/752-0900 www.hp.com	\$149	86	2.6/0.5	Good/ Good	7.2/14.6	FEATURES: Rated 4.6 ppm monochrome/3.1 ppm color. 600-b 1200-dpi maximum resolution, 100 sheets input, 50 output. SUMMARY: HP's DeskJet 842C has a good price, but its performance rather slow. Output quality is a mixed bag: dark and crisp text ar smooth but foggy graphics. Documentation is outstanding.
8	Epson Stylus Color 880 (NEW) 800/463-7766 www.epson.com	\$149	85	4.5/1.2	Good/ Good	3.3/11.6	FEATURES: Rated 12 ppm monochrome/9 ppm color 2880-by-720-dpi maximum resolution, 100 sheets inpu 30 output. SUMMARY: Quick performance and good text and color graphics distinguish this newcomer. As with most Epson printer print quality improves significantly on glossy paper.
9	Epson Stylus Color 980 800/463-7766 www.epson.com	\$249	83	6.6/2.0	Adequate/ Adequate	3.5/9.8	FEATURES: Rated 13 ppm monochrome/10.5 ppm color 2880-by-720-dpi maximum resolution, 100 sheets inpu 50 output. SUMMARY: Speediest on the chart, this unit is almost a fast as a monochrome laser. But its smudged, jagged text and film dotted graphics fall short. Has a good software bundle.
10	HP DeskJet 952C 800/752-0900 www.hp.com	\$299	83	3.9/0.7	Good/ Good	3.6/11.1	FEATURES: Rated 5.1 ppm monochrome/3.6 ppm color. 2400-bi 1200-dpi maximum resolution, 100 sheet input, 50 output. SUN MARY: With reasonable print quality and speed, the HP DeskJe 952C fits well in a small or home office. But for \$100 less with ju slightly slower text speed, the DeskJet 932C makes a better choic



HOW WE TEST The overall rating we assign to each ink jet printer is based on a combination of seven measures, given the following weightings: price (25 percent), print quality (20 percent), features (15 percent), ease of use (15 percent), speed (10 percent), service and support (10 percent), and cost of consumables (5 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



DEBUTING ON THE CHART in eighth place is Epson's \$149 Stylus Color 880, a fast ink jet with good all-around print quality. Epson's other new contender, the Stylus Color 777, just misses

the chart. HP's high-end, \$999 Business Ink Jet 2250TN also doesn't make the Top 10, but it could be a good fit for small workgroups, as it offers both standard networking capability and loads of extra features. Next month: monochrome lasers.

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> \* Source: PC Data U.S. Distribution Retail Hardware Reports, May 2



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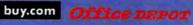


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# TOP 10 MONITORS

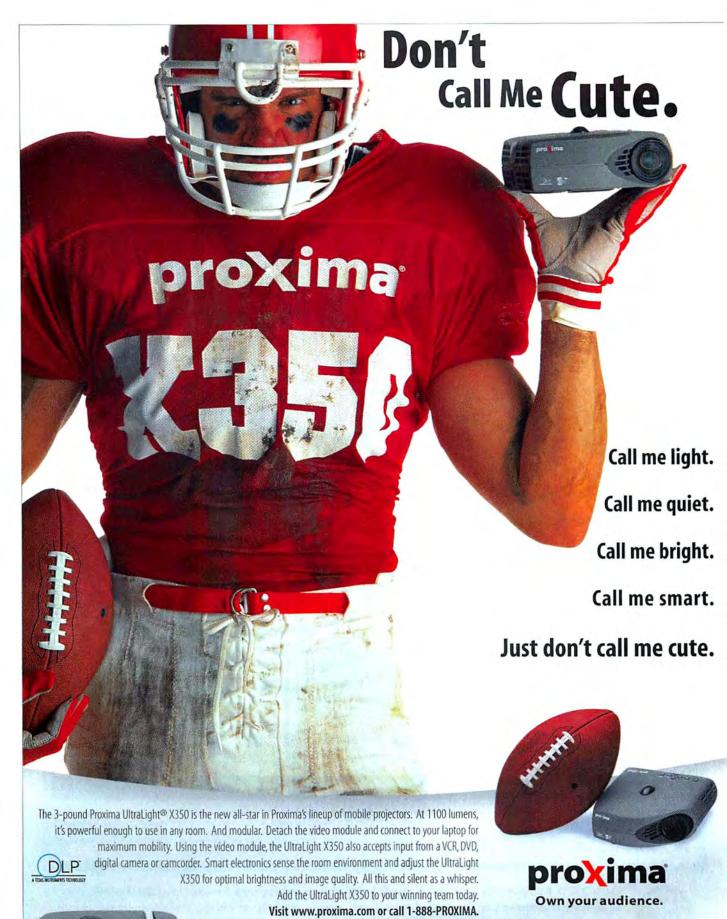
	19-INCH MONITOR	Month tested	Street price (9/15/00)	Overall rating	Quality of text/graphics	Comments
1	Samsung SyncMaster 950p 800/726-7864 www.samsungmonitor.com	Mar 00	\$319	86	Very good/ Very good	FEATURES: 17.9-inch viewable area, .26mm dot pitch tube, up to 119-Hz refres rate. Plug and Play ready. TCO'99 compliant, three-year warranty, .24-hou toll-free support. SUMMARY: Superb image quality and \$30 price drop kee this model at the top. Easy-to-use on-screen controls; bulky size may not sui cramped spaces. Also sports BNC connectors, useful for high-end graphics.
2	Cornerstone Technology c901 800/562-2552 www.monitorsdirect.com	May 00	\$324	83	Very good/ Good	FEATURES: 18-inch viewable area, .26mm dot pitch tube, up to 116-Hz refres rate, Plug and Play ready, TCO'99 compliant, three-year warranty, 24-hou weekday toli-free support. SUMMARY: \$25 price drop helps make this mode a good choice for users on a budget. Razor-sharp text on spreadsheets, bu colors on Web pages not as lively as on competing monitors.
3	ViewSonic GS790 800/888-8583 www.viewsonic.com	Aug 00	\$389	83	Good/ Very good	FEATURES: 18.1-inch viewable area, .26mm dot pitch tube, up to 118-Hz refres rate, Plug and Play ready, TCO'99 compliant, three-year warranty, 24-hou daily toll-free support. SUMMARY: Vibrant colors in photos and on Web page make this model a good choice for graphics pros. Around-the-clock tech support useful for both business and SOHO users.
4	Dell UltraScan P991 800/388-8542 www.dell.com	Mar 00	\$589	81	Excellent/ Very good	FEATURES: 17.8-inch viewable area, .24mm25mm varying stripe pitch FI Trinitron tube, up to 134-Hz refresh rate, Plug and Play ready, TCO'99 com pliant, three-year warranty, 24-hour daily toll-free support. SUMMARY: The priciest model on the chart—and \$30 higher this month—delivers ultracriss lettering in word processing documents. Also renders rich graphics.
5	Philips 1098 877/835-1838 www.philipsusa.com	Mar 00	\$399	81	Good/ Very good	FEATURES: 17.9-inch viewable area, .25mm dot pitch tube, up to 120-H; refresh rate; Plug and Play ready, TCO'99 compliant, three-year warranty, 16 hour daily toll-free support. SUMMARY: A \$30 price drop keeps this mode competitive. Bold graphics, USB port, and short case depth suit graphics user with limited space. Slightly blurry text on spreadsheets.
6	LG Studioworks 995E 800/243-0000 www.lgeus.com	Mar 00	\$360	80	Very good/ Very good	FEATURES: 18-inch viewable area, .26mm dot pitch tube, up to 120-Hz refrest rate,! Plug and Play ready,! TCO'99 compliant, three-year warranty, 12-hou daily toll-free support. SUMMARY: Moves up a notch thanks to \$60 drop is price. Delivers legible text and clear images. Lacks some advanced on-screen controls, but the ones it has are easy to use.
7	Sampo AlphaScan 812SR 770/449-6220 www.sampotech.com	Mar 00	\$349	80	Very good/ Very good/	FEATURES: 17.5-inch viewable area, .25mm dot pitch tube, up to 130-H; refresh rate. Plug and Play ready, TCO'95 compliant, three-year warranty, 10 hour weekday toll-free support. SUMNARY: Impressive image quality offset by chintzy support hours. A \$20 price drop boosts it up one spot. Crude icons ma on-screen control menu; reduced case depth helpful in tight spots.
8	MGC 997SN 877/428-9642 www.mgcusa.com	Aug 00	\$369	80	Very good/ Very good/	FEATURES: 18-inch viewable area, .25mm dot pitch tube, up to 120-Hz refrest rate. Plug and Play ready, three-year warranty, 12-hour weekday toll-free support. SUMMARY: Sharp text on spreadsheets, lively graphics, and a competitive price keep this model in the running. Lacks weekend tech support, so it might be a better choice for business users. TCO'99 compliance optional.
9	liyama 190a 800/394-4335 www.ilyamadirect.com	NEW	\$450	π	Very good/ Good	FEATURES: 18-inch viewable area, .25mm27mm varying stripe pitch Dia mondtron NF tube, but to 143-Hz refresh rate, Plug and Play ready, not TCC compliant, three-year warranty, 8-hour weekday toll-free support, SUMMARY Crisp text makes this a good choice for word processing. Not the best option for SOHO use, since skimpy tech support is available only on weekdays.
10	Optiquest 095 800/843-6784 www.optiquest.com	Aug 00	\$309	77	Good/ Good	FEATURES: 18.2-inch viewable area, .27mm dot pitch tube, up to 107-H: refresh rate, 'Plug and Play ready,' TCO'99 compliant, three-year warranty, 24 hour daily toll-free support. SUMMARY: Sports the lowest price tag on the chart. That affordability makes this model appealing, but you don't have to pay much more to get better image quality.

HOW WE TEST Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, a newsletter, spreadsheets, Web pages, and scanned images. The overall rating is based on text and graphics quality (25 percent), price (25 percent), features and ease of use (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on texts designed and conducted by PC World Test Center. All rights reserved. Maximum refresh rate at 1024 by 768 resolution. Plug and Play monitors and graphics cards can communicate bidirectionally. However, Windows 95 does not fully utilize monitor Plug and Play. Uses an aperture grille whose parallel wires near the sides of the screen are strung farther apart than those at the middle.



OUR TWO BEST BUYS hold their ground again this month, thanks to their impressive image quality and reasonable prices. Only one new monitor-the Iiyama Igoa-debuts. With its deft dis-

play of sharp lettering, the Igoa would be a solid choice for users who work heavily with text. Another model from Iiyama, as well as models from Cornerstone, Eizo Nanao, Envision, Sony, and ViewSonic, fell short. Next month we tackle 17-inchers.





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# TOP 10 GRAPHICS BOARDS

	AGP BOARD	Month tested	Street price (9/22/00)	Overall rating	Mixed-media business rating	3D games rating	Features rating	Comments
1	Cardexpert GeForce2 MX 800/539-2273 www.gainward.com	NEW	\$129	95	Excellent	Excellent	Very good	FEATURES: 4X AGP, NVIdia Geforce2 MX chip, 32MB of SDRAM 350-MHz RAMDAC. SUMMARY: Terrific performance, lowest pric we've seen for Geforce2 MX chip. Its sibling, the \$210 Geforc 256 DDR, performs well too, and includes a 30-games bundle plu multimedia extras such as TV-out.
2	Matrox Millennium G400 Max 800/361-1408 www.matrox.com/mga	Apr 00	\$209	93	Excellent	Very good	Very good	FEATURES: 4X AGP, Matrox G400 Max chip, 32MB of SGRAM 360-MHz RAMDAC, TV-out, two VGA ports, bundled Micrograf Picture Publisher and Simply 3D, plus 3D game—Rage Software Expendable. SUMMARY: Solid speed and dual-display suppor keep card near top. The \$299 Marvel G400-TV offers TV tuning.
3	Hercules 3D Prophet II MX 877/484-5536 www.hercules.com	Nov 00	\$150	91	Excellent	Excellent	Very good	FEATURES: 4X AGP, NVIdia GeForce2 MX chip, 32MB of SGRAM 350-MHz RAMDAC, bundled 3D games-Quake 3 Arena and Ray man2, among others. SUMMARY: Offers brisk performance an ample games at an alluring price. Like the number one Card expert, it's a nice choice for cost-conscious gamers.
4	Asus AGP-V7100 Pure 32MB 510/739-3777 www.asus.com	NEW	\$139	91	Excellent	Very good	Excellent	FEATURES: 4X AGP, NVIdia GeForce2 MX chip, 32MB of SDRAM 350-MHz RAMDAC. SUMMARY: Formidable performance and a aggressive price distinguish this board. A good choice for main stream businesses. The \$189 AGP-V6600 Deluxe 32MB sport video capture, TV-out, and 3D glasses.
5	Leadtek WinFast GeForce 256 DDR 888/532-3835 www.leadtek.com	May 00	\$249	90	Excellent	Excellent	Very good	FEATURES: 4X AGP, NVidia GeForce 256 chip, 32MB of DD SGRAM, 350-MHz RAMBAC, TV-out, Asymetrix 3D/FX and Digits Video Producer, bundled color-calibration tools. SUMMARY Ample software bundle complements zippy 3D performance Good choice for image pros.
6	ATI Rage Fury Pro 905/882-2600 www.ati.com	Feb 00	\$139	88	Good	Good	Very good	FEATURES: 4X AGP, ATI Rage 128 Pro chip, 32MB of SDRAM, 350 MHz RAMDAC, TV-out, video capture, bundled 3D games—Activ sion's Heavy Gear 2 and GT Interactive's Need for Speed IV SUMMARY: Inexpensive board performs impressively in ever game but Ouake 3 and is a good choice for casual gamers.
7	ELSA Gladiac 800/272-3572 www.elsa.com	Aug 00	\$329	85	Excellent	Excellent	Very good	FEATURES: 4X AGP, NVidia GeForce2 GTS chip, 32MB of DD SGRAM, 350-MHz RAMDAC. SUMMARY: Pricey, but this swift per former renders lovely images and features digital output. Light ing effects look good in Quake 3. Package includes two fre games, available online.
8	ATI Radeon 32MB DDR 905/882-2600 www.ati.com	NEW	\$150	85	Very good	Very good	Very good	FEATURES: 4X AGP, Radeon chip, 32MB of DDR SDRAM, 350-MH RAMDAC. SUMMARY: Lacks software, but makes the chart thank to solid performance. Its \$249 All in Wonder cousin is a bette choice for video editing, though gaming performance suffers Generous five-year warranty.
9	Creative Labs 3D Blaster Annihilator 2 800/998-1000 www.creativelabs.com	Sept 00	\$300	84	Very good	Excellent	Very good	FEATURES: 4X AGP, NVidia GeForce2 GTS chip, 32MB of DDI SGRAM, 350-MHz RAMDAC, bundled color-calibration tools. SUM MARY: Has high-powered 3D performance and carries a reason able price for the NVidia GeForce2 GTS chip set. Sky effects loo blotchy in Quake 3, as is typical of boards that use this chip.
10	3dfx Voodoo5 5500 AGP 800/234-4334 www.3dfx.com	Sept 00	\$299	84	Very good	Very good	Very good	FEATURES: 4X AGP, 3dfx VSA-100 chip, 64MB of SDRAM, 350-MH RAMDAC, bundled color-calibration tools. SUMMARY: Though thi card had been eagerly awaited, it pulled in slightly lower 30 per formance scores than did cards with the GeForce2 GTS chip. Still it earned the highest score in Unreal Tournament.



HOW WE TEST We test boards under Windows 98. Business tests include PC WorldBench 98. Our 3D-gaming score is based on four games, each evaluated on frame rate and image quality. We test AGP boards in a Dell Dimension XPS T600 with a Pentium III-600 CPU and I28MB of RAM. Overall rating is based on performance (42.5 percent), features (27.5 percent), price (20 percent), and support policies (10 percent). For all scores, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



A NEW BOARD MUSCLES into Best Buy territory this month, thanks to NVidia's GeForce2 MX chip-a fast, inexpensive alternative to costlier rivals. The 32MB Cardexpert GeForce2 MX sells for a dirt-cheap \$129—the lowest price we've seen for a card with the MX chip. It's a terrific choice for cost-conscious gamers. Another GeForce2 MX graphics card, the Asus AGP-V7100 Pure, debuts at the number four spot with a \$139 price tag.

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# TOP 10 CD-RW DRIVES

	CD-RW DRIVE	Street price (9/27/00)	Overall rating	Performance/ support policies	CD-R write speed for 430MB/CD-RW write speed for 100MB (min:sec)	Comments
1	Plextor PlexWriter 12/10/32 800/886-3935 www.plextor.com	\$260	85	Excellent/ Very good	5:14/1:32	FEATURES: 12X/10X/32X, IDE, internal, 2MB buffer, Adaptec Easy Cl Creator 4.02 and DirectCD 3.01, one-year warranty, II-hour weekda toil-free support. SUMMARY: Plextor's fastest drive drops by \$15 State-of-the-art CD-R and CD-RW write speeds make this drive the third-fastest on the chart.
2	Ricoh MediaMaster MEW) MP7120A 877/742-6479 www.ricohdms.com	\$279	84	Excellent/ Excellent	4:43/1:28	FEATURES: 12X/10X/32X, IDE, internal, 4MB buffer, Prassi PrimoCC and AbCO 1.3, one-year warranty, 15-hour weekday toll-free support SUMMARY: With help from Prassi's mastering software, this drive shatters our old CD-R write record by 13 seconds and beats the previous best at CD-RW packet-writing tasks by 1 second.
3	Sony Spressa Professional CRX140E/CH2 800/352-7669 www.sony.com	\$179	84	Very good/ Very good	7:04/3:24	FEATURES: 8X/4X/32X, 'IDE, internal, 4MB buffer, Sony CD Extreme 1.1, Prassi AbCD 1.3, one-year warranty, 12-hour weekday and Saturday toll-free support. SUMMARY: Sony's CD Extreme and Prassi's AbCD provide excellent mastering and packet-writing packages. Sony's SCS version, the CRX140S/CH, offers virtually identical performance.
4	Plextor PlexWriter 8/4/32 800/886-3935 www.plextor.com	\$185	83	Very good/ Very good	7:06/3:43	FEATURES: 8X/4X/32X, IDE, internal, 4MB buffer, Adaptec Easy CC Creator 3.5c and DirectCD 2.5b, one-year warranty, 11-hour weekday toll-free support. SUMMARY: This unit offers great performance and features for S15 less this month. It parses digital audio quickly, and its AudioFS drivers allow drag-and-drop extraction of CD audio tracks.
5	Pacific Digital 8824ei 888/333-6732 www.lpdc.com	\$179	83	Very good/ Good	7:13/1:56	FEATURES: 8X/8X/24X,* IDE, internal, 2MB buffer, NTI CD-Maker 2000 and BackupNow, MusicMatch Jukebox, Sound Forge XP Demo, one-year warranty, 10-hour weekday toll-free support. SUMMARY: For a super-low price, this drive combines 8X write and rewrite speeds with packet-writing, mastering, and music software.
6	Hewlett-Packard CD-Writer Plus 9100i 970/635-1500 www.hpcdwriter.com	\$199	82	Very good/ Good	7:10/3:25	FEATURES: 8X/4X/32X, IDE, internal, 4MB buffer, Adaptec Easy CD Creator 3.5 and DirectCD 3.0, one-year warranty, 12-hour weekday tol support. SUMMARY: Ouick 8X CD-R and 4X CD-RW performance, plus easy installation and a \$50 price drop. HP's 9110i model has identical hardware but a software bundle better suited for writing music.
7	Yamaha CRW8824EZ 888/926-2426 www.yamaha.com	\$200	82	Very good/ Very good	7:14/1:57	FEATURES: 8X/8X/24X, 'IDE, internal, 2MB buffer, Adaptec Easy CD Creator 4.02c, DirectCD 3.01c, and Toast 4.1; Adobe PageMill 3 and PhotoDeluxe BE 1.1; MusicMatch 5.1, one-year warranty, 12-hour weekday toll-free support. SUMMARY: This unit sheds \$49 and cuts the CD-RW write time of an 8X/4X/32X drive by half, but its 24X read time is slow
8	Hewlett-Packard CD-Writer NEW) Plus 9510i 970/635-1500 www.hpcdwriter.com	\$299	81	Excellent/ Good	4:56/1:46	FEATURES: 12X/8X/32X, IDE, internal, 4MB buffer, HP MyCD and Fast Format, Sonic Foundry's Acid, MusicMatch Jukebox, one-year warranty, 12-hour weekday toll support. SUMMARY: Superb drive performance plus an easy one-step software installation for novices. For this price, though, we expected more impressive software than HP's MyCD.
9	Creative Labs CD-RW NEW Blaster 8432 800/998-1000 www.creative.com	\$149	81	Very good/ Good	7:13/3:27	FEATURES: 8X/4X/32X,' IDE, internal, 2MB buffer, Nero 4.0, Prass AbCO 1.3.3, one-year warranty, 14-hour weekday toll support. SUM-MARY: Though slower than some drives, this unit drops \$70 and provides steady performance with Direct Memory Access enabled. Unlike most 8X drives we've seen, this unit has a 2MB buffer, not 4MB.
10	Acer CRW1032A 888/723-2238 www.acercm.com	\$199	81	Very good/ Excellent	6:08/3:25	FEATURES: 10X/4X/32X,\(^1\) IDE, internal, 4MB buffer, Adaptec Easy CD Creator 4.02c, DirectCD 3.01d, one-year warranty, 24-hour weekday toll-free support. SUMMARY: This drive's CD-R runs a bit slower than other 10X drives, but its 4X CD-RW performance was on-target. Acer offers unmatched tech support hours.

HOW WE TEST We test CD-RW drives on a Micron Millennia Celeron-400 system with 64MB of RAM, a 13GB hard drive, and Windows 98. To gauge CD-ROM read performance we use Testa Labs' CD Tach 98 version 2.0, and install Microsoft's Office 2000 suite in its default configuration. To determine CD-R write performance, we burn 430MB of data to CD-R flow an audio CD to the hard drive. We evaluate digital audio extraction speed by extracting a 250MB track from an audio CD to the hard drive. We measure CD-RW packet-writing performance by copying 100MB of flies to a CD-RW disc twice. Overall ratings are based on performance (40 percent), price (20 percent), features (20 percent), tech support policies (10 percent), and ease of installation (10 percent). CD-R write/CD-RW write/CD-ROM read speeds; 1X = 150 KBps.



A STEADY INFLUX of units with 12X CD-R write and 32X read speeds raises the performance bar. Even so, Plextor's PlexWriter 12/10/32 maintains its number one spot with outstanding performance and a slightly lower price. The best of the new drives, Ricoh's MediaMaster MP7120A, posted the chart's fastest CD-R and CD-RW write speeds. HP's CD-Writer Plus 9510i nearly matched the Ricoh's burn rate but costs \$20 more.



WINDOWS TIPS

SCOTT DUNN

### Superscrub Your **Drive Automatically**

FOR YEARS, WINDOWS NT users have been able to use the command line to delete temporary files automatically. Now Windows 2000 and Windows Me let you fine-tune the process

by using the Disk Cleanup tool's Task Scheduler to perform such diskkeeping chores as emptying the Recycle Bin and deleting offline network files, cached Internet files, and indexed catalog files.

Choose Start. Run, type cleanmgr /sageset:1, and press <Enter>. The number 1 in the command line can be changed to any number you choose from 0 to 65535, each representing a separate custom cleanup style that you can record and invoke at any time. In the Disk Cleanup Settings dialog box, check the items you want deleted (see FIGURE 1). When you're done, click OK to store the settings in the Windows Registry. To make Disk Cleanup run with the new settings, choose Start-Run and type cleanmgr /sagerun:1 (replacing 1 with the number you specified in the /sageset switch). Note: When you customize Disk Cleanup this way, it unfortunately acts on all drives rather than prompting you for a specific drive to clean up.

You can, however, use this technique to create a shortcut containing custom cleaning settings. For example, to make a shortcut that deletes only Internet Explorer cache files, enter cleanmgr /sageset:2 (or another num-

ber) in the Run box as explained above, and press (Enter). Check Temporary Internet Files and confirm that everything else remains unchecked. Then click OK. Next, right-click the desktop (or the folder that will hold your cleanup shortcut) and choose New-Shortcut. In the command line, type cleanmgr /sagerun:2 (use the same number here that you used earlier), and click Next. Type a name for your shortcut such as Destroy IE Temp Files, and click Finish. Next time you double-click the icon, your temporary Net files will be history.

To make Windows delete these files automatically at a preset time, choose Start · Programs · Accessories · System Tools · Scheduled Tasks. Select the icon you just created and drag it into the Scheduled Tasks folder window. Double-click the icon, click the Schedule tab, and specify when you want your custom cleanup shortcut to run. Then click OK and close the Scheduled Tasks window. Henceforth, your custom cleanup will occur on the schedule you established.

For more information, check out last February's Windows NT column (www. pcworld.com/feb2000/nttips).

#### QUICKER PRINTING FROM YOUR PORTABLE COMPUTER

ALL Versions YOU USE YOUR laptop on the road, but you probably print the documents you've been working

on at home or in the office. How do you remember which files need to be printed and where the files are located? Timothy Luoma of Gainesville, Florida, suggests



FIGURE 1: THE DISK CLEANUP settings in Windows Me and 2000 automate file deletions.

having Windows pause printing until you reconnect to the printer. The details vary from one version of Windows to the next, but the steps are about the same.

Before you start working, choose Start. Settings. Printers. Right-click the default printer (the one you normally print with), and choose Work Offline or Use Printer Offline (for a networked printer) or Pause Printing (for a local printer) (see FIGURE 2). You can do this at any time, whether before you disconnect the machine from your printer or after you've left the office. When you do your work, choose the File-Print command as soon as



FIGURE 2: CHANGE YOUR PRINTER settings for simpler document printing from a portable PC.

your document is ready for printing, just as you would if the printer were still available. The printer icon will appear in the tray area near the clock on the taskbar, but no error messages about its inability to print will appear. Double-click the icon to see a log of the files you'll print later. If you decide not to print an item, select it in the printer window and press <Delete>. If you're using Windows 98 SE or Windows Me, the OS will remind you that you have jobs to print the next time you reboot. The Printers Folder will tell you how many jobs are in the queue, and you'll be prompted to print them, delete them, or leave them paused (see FIGURE 3).

Once you reconnect your portable computer to your printer, you can tell Windows to print any or all of the items. In Win 98 SE or Me, simply click Yes to answer the prompt that appears after you double-click the printer icon on the taskbar. If you don't see a printer icon there, choose Start. Settings. Printers and double-click the appropriate icon in the Printers window. Deselect Printer-Work Offline or Printer. Use Printer Offline (for a networked printer) or Printer-Pause Printing (for a local printer) to return to your normal printer setting. In some versions of Windows, your documents will begin printing immediately. In other versions, you must select all the print jobs you want to print, right-click a selected item, and deselect Pause Printing to disable the pause for those documents. Voilà! Nous avons beaucoup des printouts!

#### MAKE SCANREG SEE ALL YOUR BACKUPS

IN A PREVIOUS Windows Tips column, you described how to increase

the number of Registry backups by editing the scanreg.ini file ["Better Automatic System Backups," August Windows Tips, www.pcworld.com/aug00/wintips]. I changed the default setting from five to ten, but when I tested it from the command prompt, I still got only the last five to choose from. What's up with that?

John Kight, Phoenix A FLAW IN ScanReg, that's what. There are two versions of ScanReg: One runs in Windows, and the other runs in DOS.

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Your graphics board and hard drive have a huge impact on your system's overall performance, but how do you get the

most out of these components? To learn how to make best use of them, visit www.pcworld.com/how\_it\_works/ graphics and www.pcworld.com/how\_it\_works/hard\_drives.

The Windows version of the Registry Checker Tool (scanregw.exe, or ScanReg for short) doesn't give you many options-it merely scans the Registry for problems and, if it finds none, offers to make a Registry backup for you. The version that runs in DOS (scanreg.exe) does a bit more, though not much. For example, it shows you a list of recent Registry backups and restores the one you choose.

To see how this works in Windows 98, reboot your computer, press <F8> at the start-up screen, and then press 5 to choose the Command prompt only option. Once you reach the C:> prompt, type scanreg and press (Enter). Follow the prompts on screen to have ScanReg analyze the Registry. If ScanReg doesn't find a problem, it will present you with a "Good Registry" screen; choose View Backups (or press Y) to see a list of recent backups. Unfortunately, as John discovered, ScanReg can't show you more than five backups-

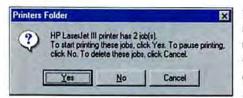


FIGURE 3: WHEN YOU START WINDOWS 98 or Me, you'll be reminded of your print jobs pending.

regardless of the number of backups that ScanReg has made in the past.

Good news: Microsoft fixed this flaw in Windows Me. The bad news is that the Me operating system has an equally troubling situation: The start-up menu no longer includes an option for booting to a command prompt. If Windows Me is already running and you choose Start. Shut Down, you won't see an option for booting to MS-DOS mode. Thank you, Mr. Gates. If you need to make repairs using ScanReg from the DOS prompt, you'll have to boot your computer using the start-up floppy disk you were prompted to make during installation. If you don't have one, choose Start-Settings-Control Panel and double-click Add/Remove Programs. Then click the Startup Disk tab and follow the instructions.

To work around the ScanReg glitch in Windows 98, you have to trick ScanReg into showing you the five backups that you would like to see. At the command prompt, switch to the folder containing your backups by typing cd c:\windows\ sysbckup (your path may differ) and pressing (Enter). Type dir rb\*.cab and press **<Enter>** to see all the Registry backups and their dates. Using this information, decide which five backups you want ScanReg to show you, and rename the rest. For exam-



FIGURE 4: TO RESTORE REGISTRY backups, select the file, right-click, and choose Extract.

ple, if you know rboo4.cab is an outdated backup, type ren rb004.cab rb004.bak and press (Enter). Repeat until only your chosen five backups have the .cab extension.

Now you can type scanreg /restore in either Windows version to view your backups in ScanReg. (This command line is a shortcut that bypasses the other screens and takes you directly to the backup list.) If you are in the throes of an actual emergency, you can use the arrow keys to select the backup you want, and press (Enter) to restore it. ScanReg will do the rest and prompt you to restart your computer when it's done.

On the other hand, you may not need to boot to a command prompt to restore a damaged Registry. In many cases, Windows will start even if the Registry is nearly kaput. So before you visit the DOS prompt, start Windows Explorer and open the Windows folder. You may need

to click Show files (Win 98) or View the entire contents of this folder (Win Me) to see any files. Either rename your existing Registry files (System.dat and User.dat) or move them to another folder just in case you make a mistake that ends up doing more harm than good.

If you don't see these files, choose View-Folder Options (Win 98) or Tools. Folder Options (Win Me), click the View tab, select Show all files (Win 98) or Show hidden files and folders (Win Me), and click OK. Locate one of the backup Registry .cab files in the Sysbckup folder (within your Windows folder), and double-click it. As long as you haven't installed software that reassigns the .cab extension, the selected backup Registry .cab file should open in its own folder window,

Select System.dat and User.dat, rightclick one, and choose Extract (see FIGURE 4). Designate the Windows folder and click OK. (If you didn't previously move or rename the existing Registry files, or change their read-only attribute, nothing

#### Protect Your Privacy With Folder Guard

I'M OFTEN ASKED if there's a way to password-protect individual folders in Windows. Using Windows alone, the answer is no; but if you're willing to shell out \$50, Win-Ability's Folder Guard will let you do just that, and a whole



lot more. You can secure folders with passwords, make them read-only, or render them completely invisible to Explorer and other programs. You can protect files at the drive or folder level, or based on a file's extension. You can set up different permissions for individual users and decide who may access the Control Panel and other system tools. Utilities such as this won't stop determined hackers, but they will protect you from the casual prying of coworkers or family members. Folder Guard is available on PCWorld.com's Downloads as fguard.zip.

> will happen because the Extract command will not overwrite read-only files.)

> If you're using an application such as WinZip, double-clicking the .cab file will open that utility; use it to extract the System.dat and User.dat files and place them in the Windows folder, then restart your computer. If something goes wrong during the process, repeat one of the preceding methods using another backup from a different .cab file.

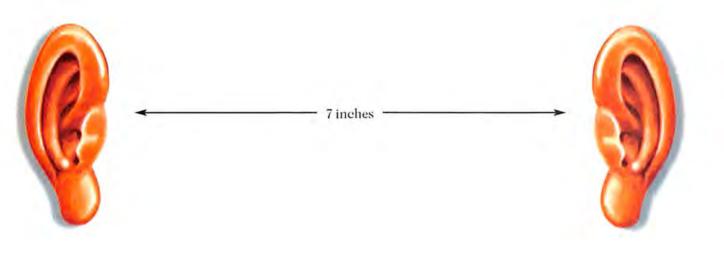
> For more tips on coping with and repairing a damaged Registry, see the June 1999 Windows Tips (www.pcworld. com/jungg/windowstips).



Find files mentioned in this article at www.pcworld.com/ downloads, and additional tips

at www.pcworld.com/heres\_how. Windows Tips pays \$50 for published tips and questions. Scott Dunn is a contributing editor for PC World and a principal author of The PC Bible, 2nd Edition (Peachpit Press, 1995).

### Now available — USB and parallel port model!



# Even with this much empty space... you can install a Backpack CD-Rewriter.

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### YOUR QUESTIONS ON: Custom file associations • Converting Mac and Unix files

# Check Your E-Mail on Anybody's Computer

I'D LIKE TO CHECK my e-mail on other people's computers when I travel, without changing their set-

tings or adding software. Is this possible?

Gloria Hill, via the Internet IT IS, BUT ONLY if you use a standard POP3 e-mail account or America Online.

Most ISPs provide their customers with a POP3 e-mail account. If you are using Outlook Express, Netscape Communicator, or Eudora, you most likely have one. If that's the case, you can use one of the free e-mail services available from a company called MailStart: the eponymous Mail-Start (www.mailstart. com, see FIGURE 1) or

WebBox (www.webbox.com).

With MailStart you simply have to enter your e-mail address and password to see your messages. You can read your e-mail, reply to messages, delete them, or send new messages. All your messages will be available in your mailbox at home until you delete them manually.

WebBox is not as simple to use as Mail-Start-at least not at first. You have to register by filling in forms and providing survey information. But you get a lot more for your time and effort-including an address book, a calendar, and 20MB of storage space. There are other extras if you pay \$5 a month or \$40 a year.

As I write this, however, MailStart has a serious compatibility problem: The service can't display an HTML-Base 64 encoded message originally created in Outlook Express. You can't even get plaintext versions of your messages. MailStart

claims that it is working on a solution to this problem, but the company can't say when a fix will be available.



Neither MailStart nor WebBox will work with America Online accounts, but that fact really doesn't present a problem because AOL has a similar service that's available for its users: AOL Anytime, Anywhere. Go to www.aol.com and enter your AOL screen name and e-mail address in the AOL Anytime, Anywhere box. Or you can simply click the AOL Mail tab at the top of any page on the site. After you sign in, click the button that says Please click

here to complete the sign-in process.

### ONE FILE TYPE. TWO ASSOCIATIONS



I'D LIKE TO associate some of my .jpg files with Photoshop and others with Internet Explorer. Can I associ-

ate files of the same type with different programs?

John Phillips. Pomona, California BY DEFAULT, Windows associates all files of a specific type with a single application, but you can associate a single file with a particular program.

Windows uses file extensions-the three characters of the file name to the right of the last period-to associate a file type with a program. To see extensions in Windows Ex-

### Put the Desktop on Your Taskbar

JULY'S ANSWER LINE (www.pcworld.com/ jul00/al) explained how to put a pop-up menu to My Computer on your Windows 98 taskbar, Ruslan Prozorov of Urbana, Illinois, has a better idea; a pop-up menu to the Desktop for easy access to the Recycle Bin, My Documents, and My Computer. Rightclick the taskbar and select Toolbars New Toolbar Desktop, Slide the end of the toolbar until only the word 'Desktop' and a small double arrow are showing. Click that arrow for access to everything on the Desktop.

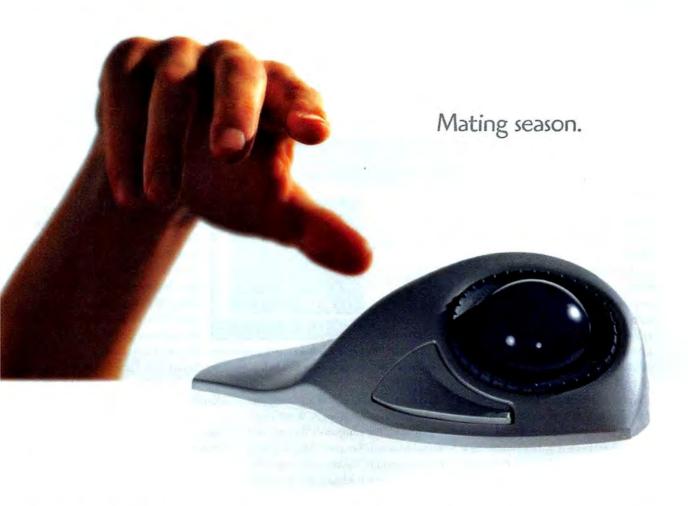
plorer, select View-Folder Options (or View-Options), click the View tab, and uncheck Hide file extensions for the known file types.

To give a file a unique association, first give it a unique extension and then associate a program with it. Changing the name is easy. With the extensions showing in Windows Explorer, select the file, press <F2>, press either the left or the right arrow key to dehighlight the file name, and change the text after the period. For instance, if you want your 'this.jpg' file to come up in Photoshop, you might call it this.psj. After you hit <Enter>, click Yes.

To set up the new association, select View. Folder Options (or View. Options). click the File Types tab, and click New Type. For 'Description of type', enter something comprehensible, such as Photoshop jpeg. For 'Associated extension', enter the extension you gave the file-psj. Don't worry about the Content Type field.



FIGURE 1: CHECK YOUR E-MAIL on anybody's computer easily and quickly through a service available at MailStart.com.



The perfect mate really can make your life easier. And finding that special trackball is easy, with four choices guaranteed to fuel desire. Looking for a comfortable relationship? The Orbit® offers trackball space savings with the comfort of a mouse. A supportive partner? Our TurboBall™ offers total ergonomic support. Insist on beauty and brains? You'll go for the dazzling looks and high speed fingertip scrolling of the TurboRing. The Expert Mouse® Pro does so many things, it's almost kinky. (Let's just say you won't find a more "advanced" trackball.) All are USB and PS/2 compatible. And all will have you working faster and more comfortably than ever. So what turns you on? To pounce on one of our trackballs, visit www.trackballs.kensington.com.









Click the New button below the Actions box to bring up the New Action dialog box. In the Action field, enter something descriptive, such as Photoshop. In the 'Application used to perform action' field, enter the name of the path to the program

file. Better yet, click the Browse button, navigate to the program's folder, and double-click the appropriate program file. Click OK, Close, and Close again. That file, and any others you give the psj extension to, will now open in Photoshop.

Windows also allows you to associate more than one program with a file type, so you can choose to open a file in any of several applications when you launch it. In Windows Explorer, select View-Folder Options (or View-Options), click the File Types tab, select the appropriate file type from the list ('JPEG Image' in this example), and then click the Edit button.

In the Edit File Type dialog box, click the New button. Follow the instructions given above for entering data into the New Action dialog box, and click OK. Back in the Edit File Type box, you'll see two actions listed. The one in bold is the default action. To change the default, select your choice and click Set Default. Click OK twice when you're done.

From now on, double-clicking a .jpg file will launch it in your default program. Right-clicking the file will let you choose from all the available options.

### CONVERT MAC AND **UNIX TEXT FILES**



I'VE FOUND that plain-text files created on Mac and Unix systems look strange on a Windows system.

Is there a way to convert them faithfully?

Lomesh Patel, Ahmedabad, India DIFFERENT PLATFORMS use different methods to mark the end of a line or paragraph in a plain-text file. If you're sharing text files with someone on another platform or setting up code on a Windows system that will run on your ISP's Unix machine, you'll get this headache. (Luckily, it doesn't arise with HTML code.)

In a Unix text file, the Line Feed character (ASCII 10) marks the end of a line. On the Macintosh, the Carriage Return character (ASCII 13) performs the very same function. Windows follows the standard established by DOS and uses both Carriage Return and Line Feed characters.

The \$5 ConvertCRLF file-format con-



FIGURE 2: CONVERT TEXT FILES to other platforms with the NoteTab Light text editor, a step up from Notepad.

version shareware from Connor Miller Software is available from PCWorld.com's Downloads. The company's Web site is at www.connor-miller.com. Also available for download is Fookes Software's free NoteTab Light text editor that converts the line ends of Mac and Unix text files on the fly. You can use the program's File Export command to save a file in alternate formats (see FIGURE 2). As a text editor, Note-Tab beats Windows' Notepad with a stick. Among its added features are drag-anddrop text editing, search and replace, and boilerplate text. The company's Web site is at www.notetab.com.

### CLEAN THE RIGHT-CLICK MENU



HOW CAN I remove the right-click context-menu options that remain long after the program that added

them has itself been uninstalled?

Carmelo Failla, Brooklyn UNINSTALLING A PROGRAM should remove all the changes it made to Windows, but sometimes to get rid of the contextmenu options an uninstalled program leaves behind, you have to edit the Registry. First, back up the Registry (see "Protect Yourself Against Catastrophic Installs" at www.pcworld.com/mayoo/al).

Now select Start-Run, type regedit, and press <Enter>. Find HKEY\_CLASSES\_ ROOT\\*\shellex\ContextMenuHandlers in the Registry Editor's left pane. Click the plus sign (+) next to 'ContextMenuHandlers' to see keys resembling Windows Explorer folders for every program that has options in the context menu. Then se-

> lect the key for the program that you thought you uninstalled.

Double-click the (Default) value in the right pane to bring up an editing box that has the Value data field highlighted. Press <Ctrl>-C to copy this string to the Clipboard. Then press (Esc). Right-click the open key in the left pane and select Delete, then Yes. Press (Ctrl>-F to start a search. With the cursor in the 'Find what' field, press <Ctrl>-V to insert the numbers that you copied from the Value data field. Uncheck the Values and Data fields and click Find Next. The search should stop at

a key inside HKEY\_CLASSES\_ROOT\ CLSID. In the right pane, the default value's data should describe the program. Press (Delete) and then select Yes. You should never see the dearly departed program's menu option again.

### WHEN MODEMS AND VOICE MAIL DON'T MIX



MY VOICE MAIL changes my dial tone when there are messages, but my modem doesn't recognize the

changed tone. I must listen to my messages before I can go online. How can I fix this?

Reggie Zeller, Barron, Wisconsin JUST TELL YOUR MODEM to stop listening for a dial tone. Open My Computer and double-click Dial-Up Networking. Rightclick the icon for your dial-up connection and select Properties. On the General tab, click Configure and then click the Connection tab. Uncheck Wait for dial tone before dialing, click OK twice, and close the Dial-Up Networking window.



You can find files from this article at PCWorld.com's Downonline loads. Send your questions to

answer@pcworld.com. We pay \$50 for published items. You'll find Contributing Editor Lincoln Spector's humorous writing at www.thelinkinspector.com.

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Kodak

The possibilities are endless with the KODAK DC4800 Camera. Get super-crisp prints up to 11" x 14" from its outstanding 3.1-megapixel resolution. Experience greater creative freedom with its manual or automatic modes and choice of warm, neutral, black-and-white, or sepia color balance. ISO settings of 100, 200, and 400 offer flexibility in various lighting and action situations. And its 3X (28-84 mm) optical zoom and 2X digital zoom lens allow you to go from wide-angle to telephoto in a snap. The feature-rich DC4800 has everything you want in a digital camera. All you have to do is supply the imagination. For more information on the DC4800, see one of the retailers below or visit us at www.kodak.com/go/digitalpictures43





### Delete e-mail safely • Check your AOL mail via POP3 • A better file compressor

# Forget Napster-Usenet Is Where the Files Are

NAPSTER, GNUTELLA, Scour, and other file-sharing utilities may get all the press, but there's a more secure alternative: Usenet. One shortcoming of file-sharing utilities is a lack of guaranteed anonymity. And though Gnutella doesn't rely on a centralized server as Napster does, users can still be identified by their IP addresses. File-sharing programs are subject to the same security flaws and viral attacks

that can afflict other Internet tools, leaving your system exposed to the digital underworld.

Most of the Usenet and other newsgroups that use the Network News Transport Protocol (NNTP) are loaded with files (a wealth of free, public-domain stuff, but also-caution!-pirated and pornographic material). And unlike with Napster and its ilk, you

don't have to turn your PC into a hackervulnerable server, though you do still need to take the same precautions you would when downloading any other file. Almost every Internet service includes news-server access, and there's probably at least one newsreader program on your PC already.

### **READ ALL ABOUT IT**

MICROSOFT'S Outlook Express is included with every copy of Windows (in Windows 95 and NT 4, it was called Internet Mail and News). Netscape's Messenger is part of the free Communicator 4.7 package available from PCWorld.com's Downloads; Forte's Free Agent is another free PCWorld.com download. Forte's \$29 Agent 1.8 is identical to Free Agent in the

newsreading department, but it adds e-mail support (you can visit the vendor's Web site at www. forte.com).

Like Internet e-mail systems, NNTP servers handle text data only, and they provide no mechanism for transferring

file attachments. So how do

they manage to serve up full-length movies? As with e-mail, the secret is to encode binary, or nontext, data files into long streams of characters that can be posted as standard text messages. For convenience, large files are often divided into multiple messages, which increases the likelihood that the entire file will survive the vicissitudes of the Net. To get the encoded

material onto your hard disk, download the messages to your newsreader, merge

them into a single file (if they've been split into multiple messages), and then decode them to recreate the original file. To handle message attachments that end with .rar, .roo, .ro1, .ro2, or a similar extension, check out our "Download of the Month," WinRAR.

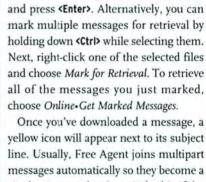
Each of the three newsreaders mentioned above accomplishes the encoding and decoding without additional software,

### Keep E-Mail on the Server

EVER ACCIDENTALLY delete your in-box? (Happens to me all the time.) You can prevent this disaster, or facilitate a switch of e-mail clients, by adjusting a setting in your e-mail program. Most programs default to deleting e-mail from the ISP's mailbox as you download it, but they can be reset to keep mail on the server for a set number of days. It's a great way to check mail from more than one system-such as home and office computers and a Web phone-without having to delete junk mail more than once.

but each uses a slightly different process. Forte's Free Agent/Agent 1.8: To download a message while you're connected to a news server, simply select the message choose Online. Get Marked Messages.

single message, but it can't do this if the messages are out of order, incomplete, or otherwise not what the program expects to see. In most cases, this situation is obvious: Instead of seeing one message with a large attachment, you see a series of



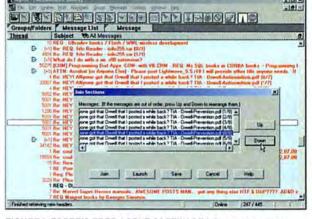


FIGURE 1: FORTE'S FREE AGENT SOFTWARE lets you rearrange multipart newsgroup posts before saving them to disk.

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THE RIGHT TO BUILT-TO-ORDER BUSINESS TECHNOLOGY.

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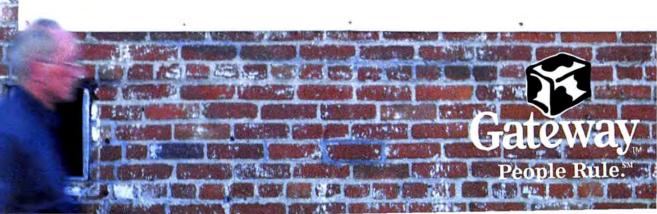
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messages whose subject lines are identical except for the sequential numbering at the end (see FIGURE 1). To join multipart messages manually, select the messages you want to connect, choose Message-Join Sections, put the sections in the correct order (if necessary) using the Up and Down buttons, and click Join.

To save the joined file attachments to your hard disk, right-click one or more messages with downloaded attachments and choose Save All Attachments. Free

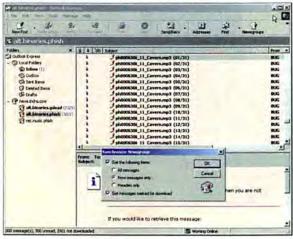


FIGURE 2: OUTLOOK EXPRESS GRABS news-server files from the Internet nearly as automatically as Forte's Free Agent.

Agent saves files by default to the \Agent\ Data\temp folder on the drive where the program is installed. Once Free Agent has saved the files (which the program signifies by changing its attachment icon from yellow to green), remove them from the newsreader by right-clicking the message and choosing Delete Body.

Outlook Express: Microsoft's newsreader is nearly as slick as Forte's. If you're online, simply selecting a message triggers Outlook Express to download it. To mark messages for later download, first choose File. Work Offline to switch to offline mode; select the messages by holding down <Shift> (to choose all files to that point) or (trl) (to choose files one at a time) while clicking on them; right-click the selected messages; and then choose Download Message Later. To download the marked messages, choose Tools. Synchronize Newsgroup, make sure that the Get messages marked for download box is checked, and then click OK (see FIGURE 2).

Once you've downloaded all the message parts of a file, select them, right-click the selection, and choose Combine and Decode. As with Free Agent, you'll have a chance to rearrange the order of sections before Outlook Express joins and decodes them. Finally, Outlook Express will present you with the newsgroup message in its own window, with the joined and decoded file attachment listed. To save it to your hard disk, choose File Save Attachments, type the path name (or browse to

> and select the folder you'd like to save the file in), and click the Save button.

Netscape Messenger: The least automated of the three readers is clearly Netscape Messenger. Unless you're dead set against working with either of the other two. don't use Messenger to download binary files. Messenger does let you work offline, but you can't mark individual messages for later download, and it has no way to save file attachments directly from Messenger to your hard disk.

You can open attachments in their associated applications, however. To do this, download the message containing the first section of the encoded file (usually labeled "1 of xx" or "1/xx," where xx is the total number of sections), and then click the link to the attachment. Messenger will download the remaining sections (even if you've already downloaded them) and open the attachment. Make sure that the application in which the file opens allows you to save the file to disk.

### ANOTHER AOL MAIL ALTERNATIVE

IF YOU SHOUTED "Hallelujah!" when you read in the September Internet Tips column about Netscape Preview Release 6's ability to access America Online Mail accounts, you may need to curb your enthusiasm a bit. Netscape has unleashed a second Preview Release, but it's just as buggy as its predecessor and likewise remains suitable only for testing.

### DOWNLOAD OF THE MONTH

### WinRAR 2.71: Super File Compressor

RARSOFT'S \$35 WinRAR 2.71 compresses massive files, or whole hard disks full of them, into single-file or multifile archives that are more compact than .zip files. Many binary files, including .mp3 and .jpg files, are already compressed; but others, such as text (.txt or .rtf) and executables (.exe), aren't. The .zip archive format is widely supported and works fine for posting files online, but bits of files may get lost as they move from server to server. It's better to post large files-especially video and software-in multiple parts.

In my informal tests using Normal compression settings, WinRAR was able to squish folders containing text files, Word files, Acrobat files, digital images, and applications into a file about 90 percent the size of the equivalent file compressed by WinZip 8, though WinRAR did take noticeably longer. WinRAR integrates with Windows Explorer, so you can extract the contents of a WinRAR archive simply by double-clicking the .rar file. The utility automatically decodes the contents of multifile archives as well.

Download the 589KB, 40-day evaluation version of WinRAR from PCWorld.com's Downloads. The company's Web site is located at www.rarsoft.com. If you choose not to buy WinRAR, you can still use the freeware UnRAR.exe command-line utility that comes with the evaluation version to decode RAR archives you encounter on the Internet.

But this is one time when we needn't be innocent victims of the sorry state of commercial software development. Rejoice! ENetBot's \$20 ENetBot Mail software lets you check your AOL mail from within any POP3-capable e-mail program (such as Eudora, Outlook, Outlook Express, or Messenger). You can get a 30-day, 1.79MB trial version of this wonderful utility from PCWorld.com's Downloads. The company's Web site is at www.enetbot.com.



Find files from this article at www.pcworld.com/downloads. Send your questions and tips to

nettips@spanbauer.com. We pay \$50 for published items. Scott Spanbauer is a PC World contributing editor.



# Delete Files While You're in a Document

WINDOWS EXPLORER IS not the best tool for deleting documents. Word 97 and 2000, which let you preview documents before you delete them, are better. Select File-Open, and when the Open dialog box appears, navigate to the folder containing the documents you want to delete. If the preview window is not open in the dialog box, click the Preview icon in Word 97 (the second option from the right in the topright corner of the dialog box) or the arrow next to the Views icon in Word 2000 (just

Qpen Concel Materials: Weatherproof, sustable for permanent outdoor display Forti. Large, Bold San Serif to Sust Test Color: Black Test Position: Centered vertically and Boverced... needs White or lists needed color of Drd Nov

FIGURE 1: THE PREVIEW PANE in the Open dialog box makes it much easier for you to confirm that you're deleting only the Word documents you intend to delete.

left of the Tools drop-down menu); then select Preview. Identify icons in the dialog box toolbar by hovering the mouse pointer over them until the tool tip appears.

Select the documents you want to delete, and check the preview window to confirm that they're the right ones. Then right-click one of the documents in the dialog box and select Delete from the context menu (see FIGURE 1). Click Yes in the confirmation box. Start by deleting just a few files at a time. And remember, you can't delete a document that's currently open in Word or any other program.

### **TEXT-DELETE SHORTCUTS**

ALL OF us make mistakes, and most of us at least occasionally try to correct them. But many Word users backspace over errors or press the < Delete> key multiple times. There are some far better ways to correct your errors, however.

To delete the word to the left of the insertion point in a document, press <Ctrl>-<Backspace>. Delete the word to the right of the insertion point by pressing <Ctrl>-<Delete>. Repeat the keystrokes to

delete more words.

To delete from the insertion point to the end of the current line, press <Shift>-<End>, then <Delete>. To delete to the beginning of the current line, press <Shift>-<Home>, then <Delete>.

To delete an entire sentence. <Alt>-click anywhere in the sentence, then press <Delete>. To delete a paragraph, tripleclick in the paragraph, then press <Delete>. And to delete a block of text, click at the beginning of the text, <Shift>-click at

the end of the text, and press <Delete>. This is faster and more precise than dragging over the text.

### HOW SYMBOLIC CAN WORD GET?



HOW CAN I SEE and use characters and symbols from a font that doesn't

appear in the Font list displayed in Word's Symbol dialog box when I click Insert+Symbol? Several foreignlanguage and symbolic fonts that I would like to use don't appear in this list.

> Dr. Harold C. Simmons, Washington, D.C.

YOU AREN'T LIMITED to the fonts in Word's Symbol dialog. To see the characters in any font available in Windows, use

### Precision Text Selection

WORD'S AUTOMATIC word-by-word text selection via click and drag can save you plenty of time and trouble. Problems may arise, however, when you're selecting text with a lot of punctuation or numbers. It often requires a feat of great dexterity and timing to keep the selection from jumping further than you want. To select via click and drag without fumbling for the correct ending point, hold down <Alt> while you make your selection. This will cause Word to select the text one character at a time.

the main toolbar to change to the desired font before you select Insert. Symbol. When the Symbol dialog box appears, select (normal text) in the dialog box's Font list to display that font's characters (see FIGURE 2). Click a character in the dialog box once for an enlarged view; doubleclick it to insert it in the document.

### SEE ALL FILES IN WORD'S **OPEN DIALOG**

TO MAKE WORD 97 and 2000 automatically list files with extensions other than .doc in the Open dialog box, select File. Open, drop down the 'Files of type' list, and select All Files (\*.\*). Then open and close any file. Thereafter, Word will use the All Files (\*.\*) choice by default until you change to another file type using the same technique.

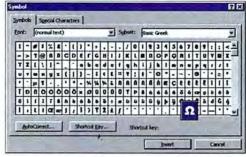
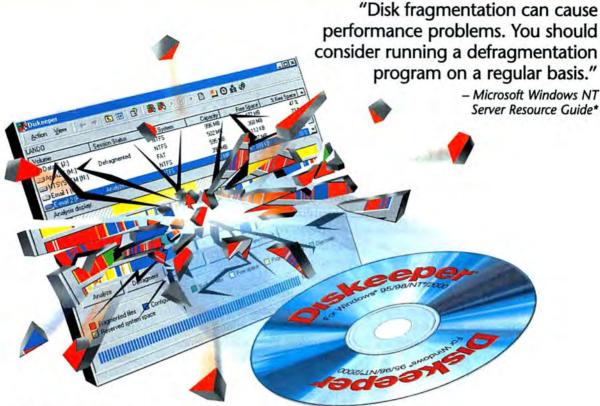


FIGURE 2: TO DISPLAY YOUR document's current font in Word's Symbol dialog box, select (normal text).



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campbell@pcworld.com. We pay \$50 for published items. George Campbell is a PC World contributing editor.



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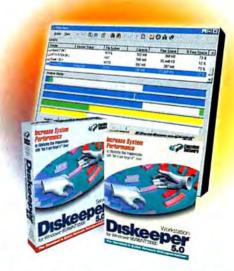
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# ILLUSTRATIONS: JAMES YANG (LEFT); JEFFREY PELO (RIGHT)

### CPU overclocking risks • Upgrade Celeron graphics • Used-PC diagnostics tool

# The Essential Guide to Hardware Gifts

THE FLASH AND FUN of many holiday gifts evaporate before the tinsel falls from the tree. Do you know someone whose inner geek cries out for the boring, the mundane, and the excruciatingly useful? Dare to be dull! Here are a few hardware splurges that many PC users will appreciate but few of us would think of as gifts.

Cut the clutter: Is the pile of detritus on your uncle's desk about to be declared a public nuisance? Or perhaps he likes to keep his PC at more than arm's distance.

Logitech's \$130 Cordless Desk-

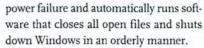
top Pro keyboard/mouse. and the company's \$60 Cordless MouseMan Wheel mouse will work as far as 6 feet from his system. They exchange radio frequency signals with a small transceiver that plugs into the USB port on the computer. Your uncle won't need a clear line of sight between the transceiver and the keyboard or mouse, unlike with in-

frared devices. The keyboard

is split for greater comfort-à la Microsoft's Natural Keyboard-and it features several programmable buttons.

Prevent power palpitations: Every PC requires a steady flow of electrical current. When the current suddenly stops, so does the PC, and that can cause major trouble. If the system stops without going through Windows' shutdown sequence, key system and application files could be damaged, and unsaved work could be lost.

American Power Conversion's \$159 Back-UPS Pro 500 USB uninterruptible power supply will keep a typical PC running for up to 10 minutes after a power failure or other electrical disruption. If you're away from your system when it loses power, the UPS senses the



A new bus could be just the ticket: Thanks to USB, the days of wrestling with cables

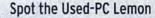
> snaking from the back of a computer may be over.

> > USB connections are faster and easier than PS/2, serial, parallel, and other I/O ports on a PC. And best of all, a single USB port can run several devices.

A seven-port hub such as the \$99 USB BusStation from Belkin permits you to connect and disconnect printers, scanners, keyboards, pointers, and just about any other peripheral under the

sun without performing contortions to reach the PC's back panel. Belkin has USB adapters for serial, SCSI, and ethernet ports to accommodate older, non-USB devices. You can add USB capability to a PC that lacks it via a PCI card such as Belkin's \$40 USB BusPort. USB works best with Windows 98 and above.

High-velocity video: If Mom is expecting a shiny new digital video camera this holiday season, she'll definitely want to add an IEEE 1394 (aka FireWire) port to her PC. An IEEE 1394 high-speed connection moves data at speeds up to 400 mbps and is becoming many digital video camera



THINKING ABOUT buying a used PC? Before parting with your hard-earned dollars, run a diagnostic check on the system's motherboard components. Chip-level problems such as a bad RAM module, a faulty clock chip, or a damaged serial port aren't always easy to detect, and they definitely aren't easy to repair. Windsor Technologies' \$10 TuffTest is an excellent diagnostic utility for BIOS-level devices. Check it out at PCWorld. com's Downloads area. You can contact the company at www.windsortech.com.

makers' download technology of choice. Apart from some new Sony and Compaq machines, few PCs come with IEEE 1394 ports. Fortunately, you can add the technology to your system via a PCI card such as SIIG's \$60 1394 3-Port PCI i/e.

Sleep soundly: Is Dad losing sleep worrying about the safety of his computer equipment? Let him lock it up. Kensington's \$30 Desktop MicroSaver Universal Security System cable lock attaches via a powerful adhesive to a desktop case and monitor. The company's \$45 Notebook MicroSaver Security Cable attaches to the Kensington security slot built into most notebooks. You'll find notebooks with a Kensington slot listed at www.kensington. com/products/pro\_1254.html.

The right tool at the right time: If you know an inveterate tinkerer whose PC's case is off more than it's on, make sure your friend has the right equipment. Belkin's \$15 Standard Computer Tool Kit (11-Piece) has all the necessary demagnetized gear, including screwdrivers, tweezers, and a handy three-pronged parts retriever.

Avoid prying eyes: You can help your friends keep unwanted onlookers from viewing their computer screen by giving them a screen filter that fits over their monitor and restricts the viewing angle to 25 degrees. That way, only someone looking directly over their shoulder can see what they're playing-uhh-working on. One such device is Kensington's Security SlimScreen (\$170 to \$330, based on the size of the monitor).

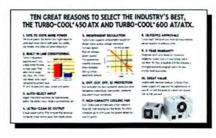


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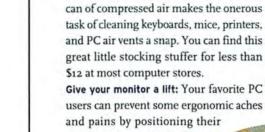
or

USB cable adapter. valued at \$79.



These plug-and-play adapters are quick, effortless and ideal for mobile professionals. They are compatible with over 2.7 million Jaz drives and are the easy way to connect your laz drive to a Mac® or PC. Offer valid through December 31, 2000.

Please stop by your local retailer or visit us online at www.iomega.com



monitors appropriately. The \$360 EasyLift Gas Monitor Arm from Kensington attaches to the edge of a desk and raises the monitor anywhere from a fraction of an inch to almost a foot above the desktop, and it adjusts horizontally as well. The EasyLift can hold 55 pounds, which covers most 17-inch and many 19-inch monitors. It may seem like an extrav-

agance, but when you consider

what your friends could save in medical bills and the discomfort they'll avoid, it may be the best gift they receive all year.

### (OVER)SET YOUR **CPU CLOCK**

I'VE HEARD THAT I can significantly boost my PC's performance by overclocking the CPU, but some people tell me that overclocking can destroy your PC. Others claim it's perfectly safe and is discouraged by CPU manufacturers only because they want you to buy a new, faster CPU. What exactly is overclocking, and if it's safe, how do I overclock my system?

Alan Goodyear, Muncie, Indiana EVERY CHIP ON a PC's motherboard produces a constant clock signal-typically at 133 MHz, 100 MHz, or 66 MHz-and much of the data flowing around the motherboard moves at that speed. Overclocking is the practice of adjusting the motherboard's clock speed so that the CPU runs faster than its original speed.

The same clock signal drives the CPU, but since most CPUs move at much faster speeds than other motherboard components, the motherboard's clock signal is

multiplied to achieve the required speed. So a motherboard running at 100 MHz will accommodate a 350-MHz Pentium II CPU if the CPU clock multiplier is set to 3.5 (3.5 times 100 MHz is 350 MHz).

Since most motherboards support a number of different multiplier settings, a CPU can often be run at a faster-or overclocked-speed. Changing the multiplier

> is easy: Most motherboards let you change the settings either through jumpers on the motherboard or via settings in the CMOS setup program. But the most important question you asked concerns safety. I'm sure AMD and Intel would like nothing better than to sell more chips, but their disapproval of overclocking is by no means

Running a CPU faster than its designated speed carries risks: A machine that

just marketing hype.

performs hundreds of millions of operations per second leaves little room for error. More seriously, higher speed produces greater heat, very possibly more than your system was designed to accommodate, which can crash your machine or even destroy your CPU.

I know many people who have successfully overclocked their systems, and they claim that the risks are minimal. I also know people who have burned up an expensive CPU while experimenting with overclocking. Being cautious by nature, I don't recommend it. If you're considering taking the gamble, do your homework. Two places to start are www.sysopt.com and www.overclockers.com.

### ALL OFF-BOARD

A YEAR OR SO ago I paid about \$1000 for a new Celeron-based computer with built-in graphics and

sound chips. Up to now, the PC has run all my word processing, spreadsheet, and other software without any problems. But I've begun to include short video clips and large graphics files in my business presentations, and unfortunately, they often appear



Perhaps the first time a remake is actually better than the original.



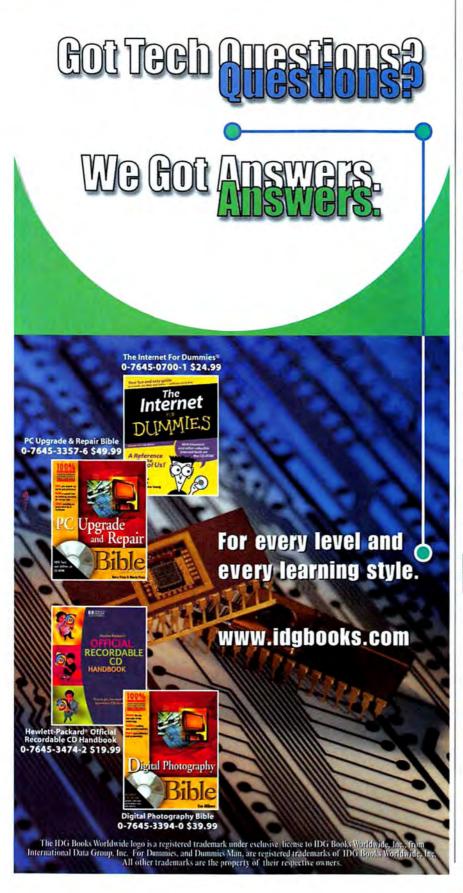
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### HARDWARE TIPS

choppy or are slow to load. Is there any way for me to install a more powerful graphics card in my current system?

Katie Latimer, Denver PROBABLY. Most of the systems with graphics capabilities integrated into the motherboard, such as your Celeron-based machine, provide some way to disable the on-board graphics circuitry to allow a better card to be added to an expansion slot. Some PCs go the additional step of recognizing that a graphics card has been added and automatically disabling the onboard graphics. Others may require that you change a setting in the CMOS setup program, or alter a jumper or DIP switch on the system's motherboard.

The only way to know what will work is to check your PC's documentation. However, low-cost PCs such as yours often lack the detailed technical documentation that answers this type of question, so you may need to contact the system manufacturer or, if all else fails, the motherboard manufacturer. Worse, most of these inexpensive systems also lack an AGP slot, relegating any graphics upgrade to a PCI slot, which can't deliver the performance boost that is possible with AGP.

If you're stuck with a system that won't accept a better graphics card, try upgrading your system RAM. Chances are your system has 32MB or less. Increasing your RAM to 64MB or more will provide a noticeable performance boost.



For other hardware tips, see www.pcworld.com/heres\_how. Find files from this article at

www.pcworld.com/downloads. Send tips and questions to kirk\_steers@pcworld. com. We pay \$50 for published items. Kirk Steers is a PC World contributing editor.

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# Networking PCs Made Easy

IF PCS ARE proliferating in your home or office, it's time to get them connected. Networking your PCs offers numerous advantages. Besides sharing files and applications, connected PCs can share a printer, saving you money.

By far the most popular reason to network PCs is to allow multiple users to share a single modem, phone line, and Internet account for Web access. Even a standard 56-kbps Internet connection can provide plenty of bandwidth for several users to surf concurrently. And shared connections are even handier if your home or office is equipped with a broadband (cable or DSL) Internet connection.

The word networking was once enough to cause fear and trembling even in experienced users, but major manufacturers have simplified the process of connecting your PCs. The mind-numbing series of individual steps formerly requiredTHE TOP Benefits: Share files, printers, and Internet connections among desktop and notebook PCs. Costs: Standard wiring \$30-\$50 per PC, phone line \$50-\$75 per PC, wireless \$150-\$200 per PC, router/firewall for shared broadband Internet \$100-\$300 Expertise level: Intermediate Time required: 45-60 minutes per PC Tools required: Phillips screwdriver, antistatic wrist strap Vendors: 3Com (www.3com.com), Intel (www.intel.com), Linksys (www.linksys. com), Lucent (www.lucent.com), Netgear (www.netgear.com)

especially for setting up the software-has now been largely automated.

Several types of networking choices are available: conventional wired networks that require you to install cable, phone line networks that use your existing wiring, and wireless networks. (See "Which Network Should You Choose," below, for comparisons.) Manufacturers have begun to follow standards that make products from different vendors compatible. That's never been a problem with conventional wired networks, but look for HomePNA 2.0 compatibility with phone line networks, and WiFi compatibility for 802.11 wireless networks. A competing wireless standard (HomeRF) promises lower prices but is late out of the starting gate.

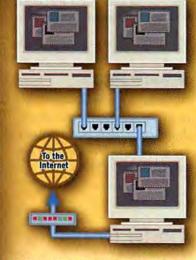
No matter which type of network you choose, you'll need to install an add-in network card in each PC. (Equipping laptops is a bit easier; they use easy-to-install external PC Cards for connectivity.)

Stan Miastkowski is a PC World contributing editor.



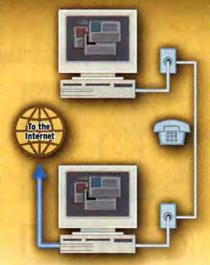
SHARING A PRINTER, files, or an Internet connection has never been easier. If you want to connect your PCs, you can choose a conventional wired network, a phone-line network, or a wireless solution. Here's a look at the advantages and disadvantages of each technology.

### VENTIONAL WIRED NETWORK



- \* Advantages: Very inexpensive, fast, and easy to expand.
- · Disadvantages: Requires running a network wire between computers. Also requires a central hub or switch.

### PHONE-LINE NETWORK



- . Advantages: Inexpensive, easy to Install, uses existing telephone wires. Adequate speed for common network tasks.
- Disadvantages: Old wiring can degrade performance, notebook adapters hard to find.

### WIRELESS NETWORK



- . Advantages: Absence of wires means you can situate PCs virtually anywhere; notebooks work even outside.
- · Disadvantages: Expensive; speed falls as distance between PCs increases.

# Stranded by traditional delivery systems?



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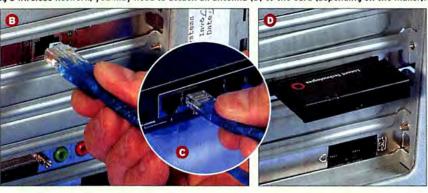


IMPORTANT: The steps below show a typical networking-card installation. Some networking kits, however, require that these steps be done in a different order. Before you begin, read the manual or installation poster that came with your kit.

1 Install the network card. Turn off your PC and unplug it from the wall. Consider using an antistatic wrist strap (available from a local electronics-supply store such as RadioShack). Locate a free PCI or ISA slot (depending on which type of card your network kit has), and remove the metal cover at the rear of the slot. Carefully insert the card and fasten it down with a screw.

Hook up the wires. If you're using a phone-line network, plug one end of the phone cable into the network card (A); be sure to use the correct jack—there's usually a second jack for hooking up a telephone. Insert the other end of the cable into the wall jack. If you're using a standard wired network, plug one end of the network cable into the card (B) and the other into the central hub or switch (C). If you're using a wireless network, you may need to attach an antenna (D) to the card (depending on the maker).





Install the software. Plug your PC back in and turn it on. On desktop and notebook PCs alike, Windows should automatically detect the network card and request the software for it. Read the on-screen directions for software installation carefully. The drivers for the network card will be on the CD-ROM that came with your networking kit. You may be asked to insert your original Windows CD-ROM and to provide other information. Follow the directions that came with your kit to install other software (such as Internet-sharing software), to set up shared printers, and to establish drive sharing.

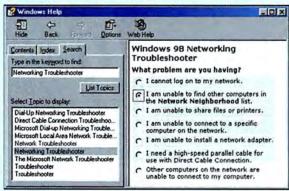
NOTE: If your networking kit doesn't automatically set up Windows'



@ Read & Write

networking software (protocols, sharing, and so on), you'll have to set it up manually. For everything you need to know, see the October 1998 Upgrade Guide (www.pcworld.com/ oct98/upgrade\_guide).

4 Test it! Test your network by connecting to other PCs and printers that you set up during installation. If you've installed Internetsharing software, try connecting to the Internet and surfing from each networked PC. If you can't communicate with other PCs on your network, go to Start+Help; in the Help section, search for, select, and display the Networking Troubleshooter and follow its directions. If your network still won't work, it's time to call tech support.



### INTERNET SHARING FOR EXISTING NETWORKS

IF YOU ALREADY have a network in place and want to set up shared Internet access, Windows 98 has built-in Internet-sharing software. To install it, go to Start-Settings•Control Panel, double-click the Add/Remove Programs icon, and click the Windows Setup tab. In the Components list, select Internet Tools, click Details, and put a check mark in the Internet Connection Sharing box. Click OK twice, and follow the on-screen directions.



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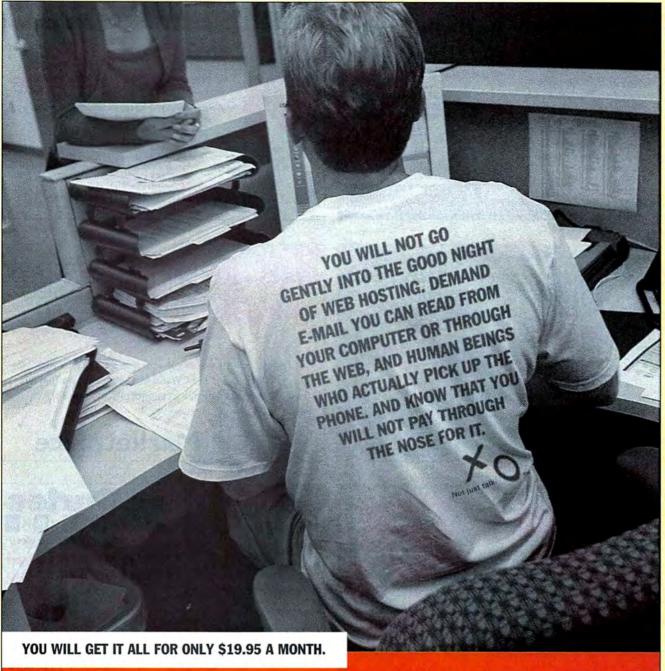
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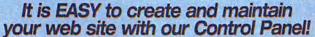
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Base Monthly Server Cost	\$18.95	\$59.95	\$89.95	\$149.95	\$199.95	\$18.95	\$89.95
Max. per domain cost @ \$2.00/domain/mo	N/A	\$50.00	\$50.00	\$150.00	\$150.00	N/A	\$125.00*
Max. possible cost to you/ month	\$18.95	\$109.95	\$139.95	\$299.95	\$349.95	\$18.95	\$214.95
Your monthly gross profit @ \$19.95 domain	N/A	\$498.75	\$498.75	\$1,496.25	\$1,496.25	N/A	\$548.75**
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Commission earnings**	N/A	N/A	N/A	N/A	N/A	N/A	\$10	To You \$14	
Ecommerce Certification Free	1	1	1	~	1	1			
Webhosting Certification Free	1	1	1	1	1	1			
Domain Management Tool (Demo)	1	1	1	1	1	1	1	In development	
Free Parking	1	~	1	1	1	1	1	1	
Real time Modifications	1	1	1	1	1	1			
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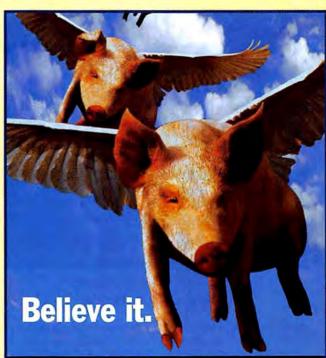
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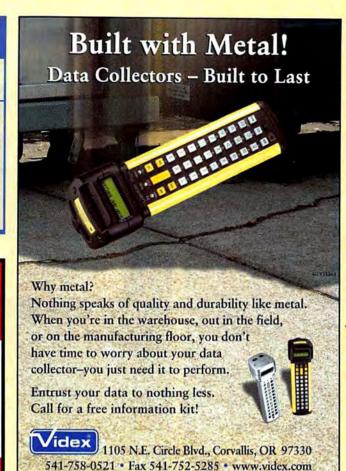
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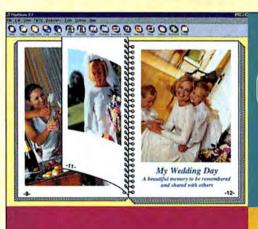
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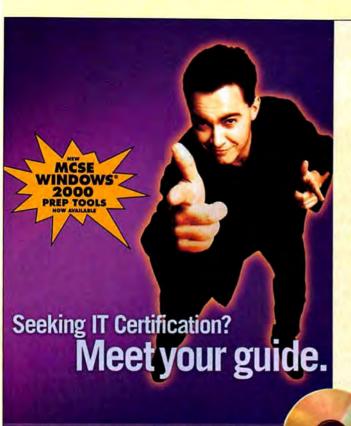
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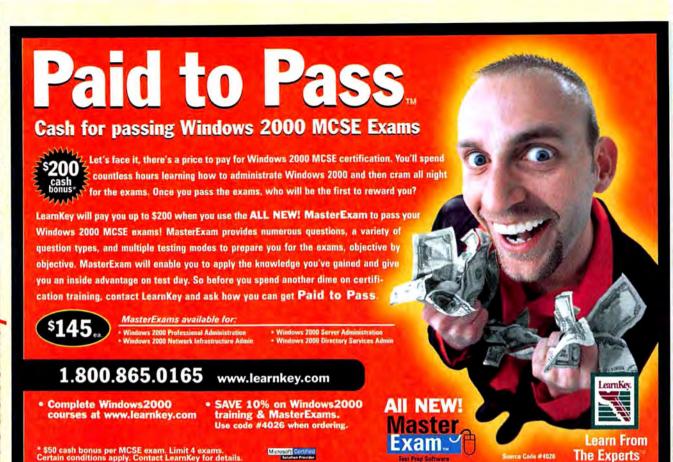






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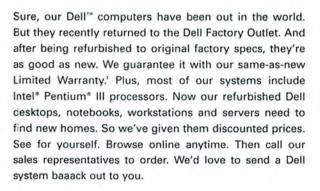
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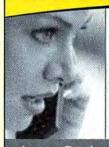
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PC World Contributing Editor Stephen Manes is a cohost of Digital Duo, a series appearing on public television stations nationwide. For program information, see www.digitalduo.com.

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