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Plus the Top Sites and the Lowdown on Legal Issues

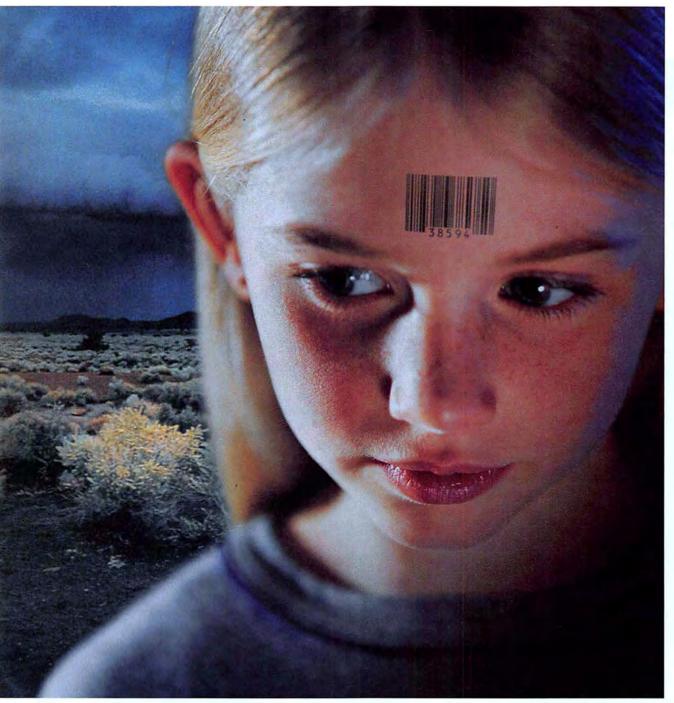


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#### **Broad Compatibility**

The BJC-85 printer supports a host of platforms including Windows<sup>\*</sup>, Windows CE and Mac<sup>\*</sup> OS<sup>\*\*</sup> right out of the box.

#### Fast IrDA

With IrDA version 1.1 you get wireless, infrared data transfer rates up to a blazing 4Mbps.

# The world's best-selling portable printer just got better.

Believe it or not, we've managed to improve one of the most advanced portable printers on earth. We started by installing both USB and parallel ports. Which means our new BJC-85 Color Bubble Jet™ Printer is compatible with virtually any operating system you might use on the road. But we didn't stop there. We also added enhanced IrDA™ for lightning-fast, wireless printing. And even with these advancements, the BJC-85 printer still weighs a mere 3.1 pounds\* So it seems you can improve on perfection. For details, visit our Web site at www.ccsi.canon.com/bjc85 or call 1-800-OK-CANON.

#### Optional Scanner Cartridge

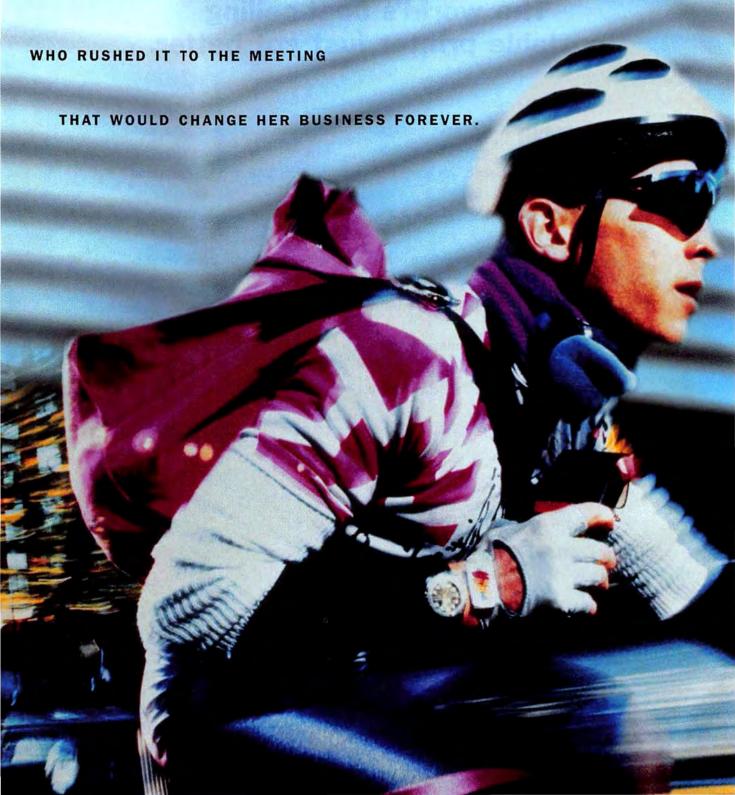
The pop-in IS-12 Color Image Scanner Cartridge converts this portable printer into a 360 dpi color sheetfed scanner.

#### A Portable Family

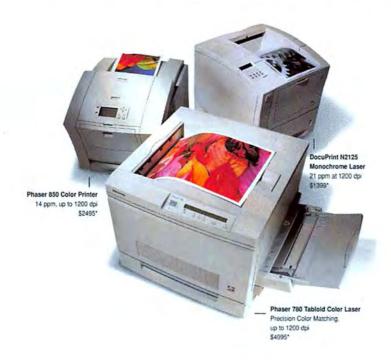
For the ultimate road warriors, Canon also offers the extremely small, 2-pound, BJC-50 Color Bubble Jet Printer.

# THAT QUICKLY PRINTED THE PROPOSAL

THAT JUST MADE IT TO THE COURIER



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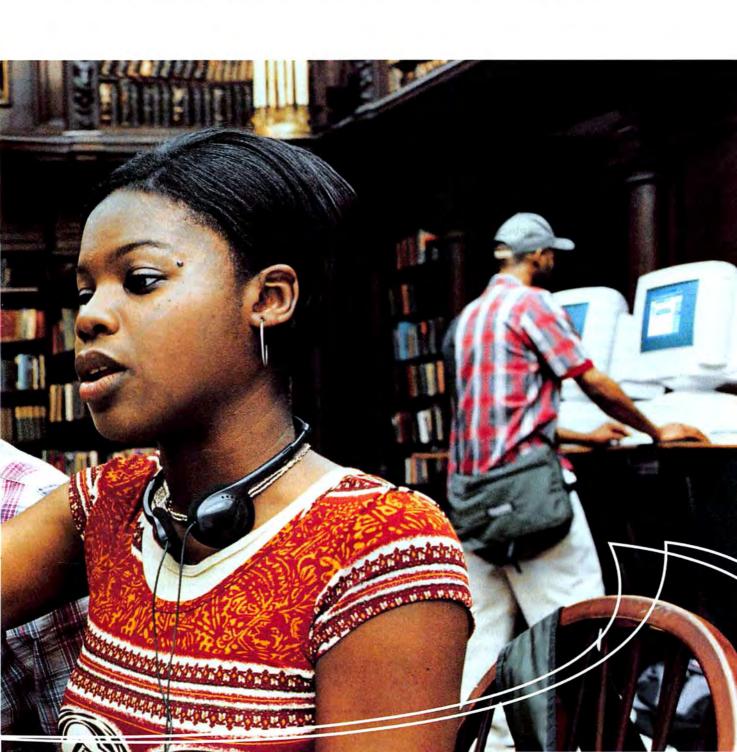




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VOLUME 18 • NUMBER 7

#### COVER STORY

#### 98 BEST PRODUCTS OF 2000

W O R L D C L A S S The all-star team takes the field in PC World's 18th annual World Class Awards for best hardware, software, and Web products. A 1999 phenom tops the 72-player roster this season to nab Best Product of the Year. Also featured: Trend of the Year, Most Promising Newcomers, Losers of the Year, and some weird Hits and Misses.

#### FEATURES

#### 114 PC RELIABILITY & SERVICE: THINGS FALL APART

CONSUMER ISSUES

If you don't own a riding lawn mower, your most trouble-prone appliance is probably your PC. For the straight story on mechanical breakdowns and vendor support, we asked 16,000 PC World readers how their systems were holding up. The results are not encouraging.

#### 125 NEW WAVE MUSIC

music, making thousands of near-CD-quality songs downloadable online. We tour the Internet music scene, looking at hardware and software MP3 players, alternative formats, and legal hot spots.

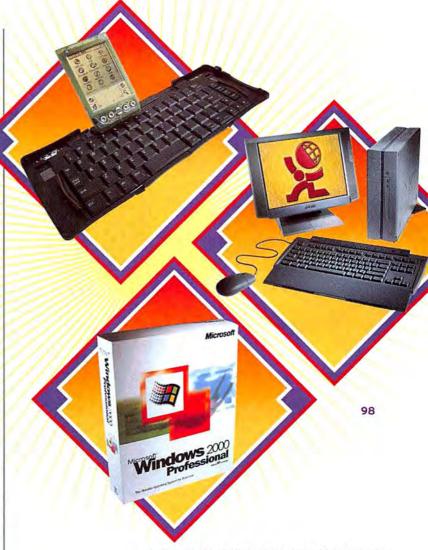
#### 143 SPIN CITY

converts among movie buffs but few others. As CD-ROMs ride the popularity of CD-Rewritable technology, DVD developers seek apps in need of vast storage. We sort out DVD-ROM, DVD-RAM, and hardware on the horizon.

COVER Photography by Stan Musilek







#### 157 TRAVEL WEB SITES: JUST THE TICKET?

#### CONSUMER ISSUES

Do-it-yourself online booking promises better deals than you'd get from a live travel agent. Does it deliver? Our intrepid reporter made it his mission to find out.

#### READER SURVEY

#### 216A FILL US IN ON HOW YOU FEEL



Complete our subscriber survey, and you might win the PC of your dreams.

### TOP OF THE NEWS

#### TOP 100

#### 54 WINDOWS 2000: THE FIRST 100 DAYS

Win 2K gets a high marks in an exclusive PCWorld.com survey: It's stable, the best version yet, a power user's dream, no more memory errors. There's just one catch...

#### 59 BIG HARD DRIVES FROM IBM, MAXTOR

Just as you're drowning in huge graphics presentation files and audio downloads, two massive-capacity drives come to the rescue.

#### **60 POWER SHOPPING: CAN YOU TRUST** E-COMMERCE REVIEW SITES?

Who's rating the raters? Not all review sites

rate Web retailers the same way. Some are prone to bias or fraud; others show you the real picture.

#### **64 AUCTION PAYMENT SITES**

Online escrow services are supposed to protect your money. Don't bank on it. Read about the risks before you send in the dough.



Don't rip up the walls. New wireless gateway devices let you share high-speed Internet access without unpacking the power drill.

#### NEW PRODUCTS

- 78 Panasonic ShowStopper Hard Disk Recorder PV-HS2000, Philips Personal TV Receiver HDR312
- 79 Dell Dimension XPS Brooor Special Edition
- 80 Fujitsu LifeBook B-2131, Toshiba Portégé 344oCT; Samsung SyncMaster 15oMP LCD
- 82 Epson Stylus Color 670; ELSA Gladiac
- 84 Canon PowerShot S20, Epson PhotoPC 3000Z, Kodak DC290 Zoom, Olympus C-3030 Zoom digital cameras
- 85 Symantec Norton Internet Security 2000; Opera 4 browser
- 86 PowerQuest PartitionMagic 5.01 and Drive Image 3; Ontrack Data PowerDesk 4 Pro
- 88 EPeachtree.com; Macromedia FreeHand 9
- 90 FinanCenter.com, LowerMyBills.com; Sage U.S. Holdings Timeslips 10

92 SPOTLIGHT Club Photo, EZ Prints, Ofoto, PhotoLoft.com, Shutterfly, and Snapfish.com online photo services





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#### 178 THE LEAP TO 1 GIGAHERTZ

TOP 100 We look at two 1-GHz systems and discover that more isn't necessarily better. Only one of the two makes the power chart-at number ten.

#### 180 POWER PCs

T O P 1 0 Three fast new PCs take their bows, including the Gateway Select 1000—the first 1-GHz PC in the Top 10.

#### 186 MIDRANGE PCs

TOP 10 Four new systems land on the chart this month, including a speedy Micro Express model in third place.

#### 192 BUDGET PCs

TOP 10 Budget deals are getting better: More systems cost less than \$1000, and more pack 600-MHz or faster CPUs.

#### 196 NOTEBOOK PCs

TOP 15 Price changes bounce two units from budget to midrange-or vice versa-and five new models debut.

#### 200 HOME PCs

TOP 15 Fast, inexpensive newcomers from Micron and CyberMax reach the chart; Dell keeps two of three Best Buys.

#### **204 COLOR LASER PRINTERS**

TOP 10 Brother's low-priced new model, the fastest text printer on the chart, shines with graphics. Two Tektronix Phasers muscle in-one with smooth, detailed images, the other with low operating costs.

#### 207 SCANNERS

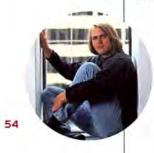
TOP 1 0 Acer, Microtek, and Visioneer cut prices on SOHO scanners. Canon's sharp corporate model retains the top spot.

#### 209 17-INCH MONITORS

TOP 10 The radiant colors of Samsung's inexpensive new SyncMaster earn it a Best Buy. Flat-screen CRTs rule the chart.

#### 211 GRAPHICS BOARDS

TOP 10 Calm before the storm: Older boards occupy all ten slots as newcomers based on NVidia's GeForce2 GTS chip set loom on the horizon.



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#### HERE'S HOW

#### 214 WINDOWS TIPS

Create pop-up annotations for folders and files, make Windows InfoTips and ToolTips look the way you want.

#### 218 ANSWER LINE

Prevent Windows from randomly accessing your floppy drive, transform your splash screen, quiet your modem.

#### 220 INTERNET TIPS

Identify and excise e-mail hoaxes and urban myth postings before they waste your time.

#### 222 WORD PROCESSING

Automate text entry in Word and WordPerfect, create split-line margin alignments, rearrange and personalize toolbars.

#### 227 SPREADSHEETS

Plot Excel chart data in two different ways, prevent users from making chan

vent users from making changes to unprotected cells, close all workbooks at once.

#### 228 HARDWARE TIPS

Keep your ink jet printer spritzing like new, reset a flickering monitor's refresh rate, use a system thermometer.

#### 232 UPGRADE GUIDE

Install a new hard drive, step-by-step.

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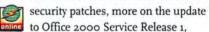




#### DEPARTMENTS

21 UP FRONT Today's home PCs require higher-end components than business PCs. Why? Because fun is hard work.
25 LETTERS Readers sound off on government intercepts of e-mail, online brokers and insurers, and digital video editing.
31 CONSUMER WATCH Become an expert consumer in minutes by using the right online database for your needs.

- 39 ON YOUR SIDE Tired of waiting at the mailbox for your rebate? Take steps to ensure you get the promised check on time.
- 43 WEB SAVVY Harry McCracken tries out people-driven Web searching and learns how to mix a cosmopolitan.
- 49 HOME OFFICE Steve Bass invites laser printer users to identify with his mom's problem—and shares ink jet secrets, too.
- 51 BUGS AND FIXES Excel and Windows



MSN-Office 2000 compatibility clash.

**262 FULL DISCLOSURE** Stephen Manes offers tips for successful online travel planning. Tip #1: Start with a paper guidebook.

#### PCWORLD.COM

#### HOW CPUS WORK

HOW IT WORKS It may seem like magic, but the technology inside a CPU is something any reader can understand. Take a tour of all the attractions.

www.pcworld.com/jul00/cpus

#### **ALL ABOUT MP3s**

HOW-TO Complementing this month's "New Wave Music" feature (page 125), our online guide covers the nuts and bolts of MP3, from finding the right player to converting your CDs into PC-ready files. www.pcworld.com/jul00/mp3s

#### SHOOTOUT: LINUX OFFICE SUITES

R E V I E W We tested two consumerready productivity apps for Linux—Corel WordPerfect Office 2000 and Applix Applixware 5—and found that Corel looks slicker, but Applixware is faster and more reliable. www.pcworld.com/jul00/linux\_suites



Additional material available online at www.pcworld.com

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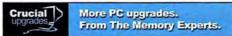
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John Brawley, Crucial Customer

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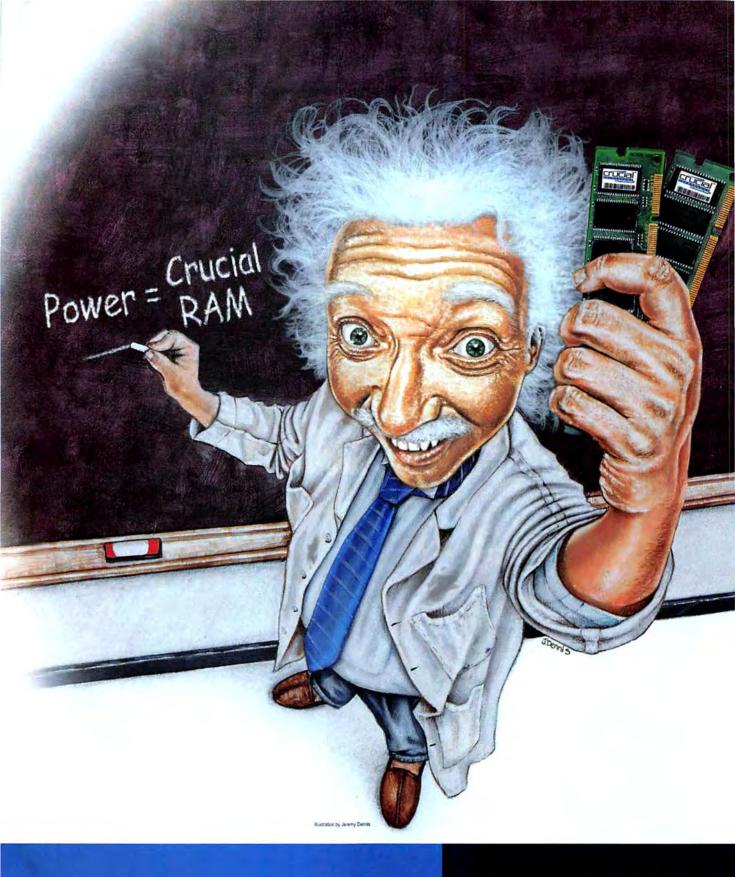
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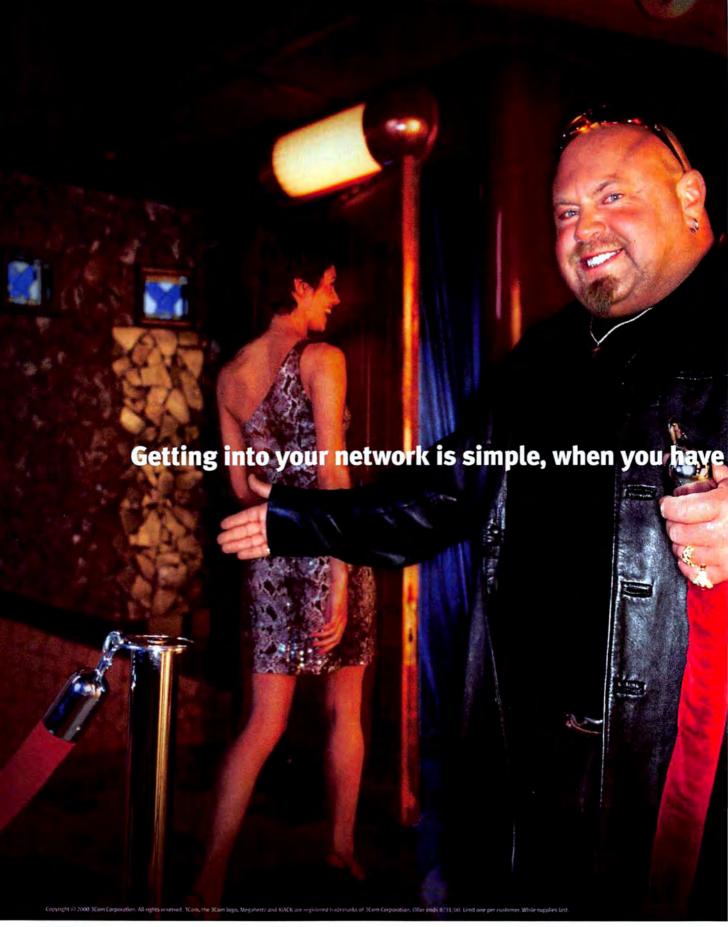
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# COMING UP

#### **BEST OF THE WEB**

In our Midsummer Madness tournament, 64 Web sites in 32 categories vie for the title. PC World editors then narrow the field down to just one surviving champion. What's the last site standing? The result may surprise you.

#### PC REPAIR CONFIDENTIAL

What can you do with an ailing system? PC World visits repair shops undercover and finds out the best ways to get good service for hardware problems and avoid a raw deal. We also tell you when to skip the fix and buy a new PC.

#### SURVIVING DSL INSTALLATION

Don't get trampled in the stampede for fast Net access. Here's a step-by-step plan to get connected painlessly, from one who's been to DSL hell and back.

#### SCANNING THE GLOBE

We test 18 scanners to come up with the Top 10: 7 easy-to-use units for small offices, and 3 corporate models with large scan beds and fancy features. Find the best one for your jobs.

#### PHOTO OPPORTUNITY

Can't afford Photoshop? How about an image editor that turns out professional results and costs less than \$100? We review 13 capable programs that can help you polish your pictures.

#### ALSO NEXT MONTH

- ▶The PC World Top 100: The best Power, Midrange, and Budget desktop PCs; Notebooks; Home PCs; Printers; Monitors; Graphics Boards; and Modems.
- ► Here's How: Internet Tips on using cell phones as wireless modems; Hardware Tips on managing multiple monitors; Answer Line on faster boot-ups.



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#### AWARDS\*

Armada E500 - WinList WinMag.com, March 2000

Deskpro EP - Best of the Best WinMag.com, September 1999

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# Needs, Wants, and Fun Machines

LET'S NOT KID OURSELVES. We don't need a 1-GHz computer in our home offices to run a spreadsheet or do word processing. A 300-MHz PII can easily do those chores. No, we want a gigahertz machine because power equals fun. And fun is going to be the underlying motivation driving a lot of the new technology-and performance gains—that will be coming your way in the near future.

For years, business users chafed at the limitations of existing systems and demanded everhigher performance. Now it's the home user who wants every ounce of power. Why? Because we do many more things on a home machine than we do at work, especially having fun. Sure, we want a capable computer so telecommuting is easier, but that's not why we rush out and buy the latest \$300 video card. We do it because we want to play 3D games where the bad guys look like they're breathing...until they get fragged. We want to edit digital photos, rip our own CDs, and stream in music from the Web-all at the same time and without ever crashing our machines. It's a simple formula: The more fun we have with our machines, the more fun we want them to be. That translates into insatiable demands for power, ease of use, and flexibility.



It's a simple formula: The more fun we have with our machines, the more fun we want them to be.

#### HOME NETWORK JUNKIE

ONCE UPON A TIME I shuddered at the idea of setting up a home network. Who wouldn't? Back in the days when a home network was just a slick way of sharing a printer and an Internet connection, setting one up simply wasn't worth the hassle and money. But when I began to think of it as a work tool and a home entertainment system, I never looked back.

I started out simple: two machines and a printer. One of the machines is an old Pentium-200 that my kids call "Mom's computer." Back when I was a network nonbeliever, this machine was designated for my wife and kids to do word processing. It was a solid work machine to be sure, but dull.

Then I put it on a network and it became interesting. Now it's a way station to the Internet and a command post for my gaming opponents, lads of 12 and 16 years.

But once a home has a connected system, you start to get

spoiled by it. Everyone wanted high-end video, so I upgraded the video cards to 3D. Then everyone wanted a revved-up connection to the Internet. I needed it for work anyway, so we dumped the modems and got DSL. My stereo sits in the same room with my machine, so I decided to run a cable from the computer sound card to my preamp and put a pair of NHT SuperOne speakers on my desk. Lately, the kids have been complaining that Mom's machine is too "janky" to play Half-Life; no surprise, I'm thinking about upgrading to a more powerful box. And as soon as I can afford a wireless bridge (see our story on networking devices on page 66). I most definitely will link up my notebook. Next on the never-ending agenda: DVD.

In a recent national survey by the Gartner Group, 30 percent of respondents said they'd consider setting up a home network if they could use it to share Internet connections and printers. That number jumped to 50 percent when they were told that they could also use it move big multimedia files around the house. In other words, as soon as the fun factor was added to the equation, the desire rose substantially.

Do we see a pattern here? The industry sure does. That's why there's an increasing buzz about making home networking easier, cheaper, and (eventually) wireless.

#### ENTERTAINMENT IS KING

AT A RECENT symposium about the growing demand among home users for better technology, Gartner Group analyst Van Baker put it succinctly: "Entertainment is king ... and Americans have again and again shown a willingness to spend money on it."

Back at work, it's a very different story.

When we're at the office, we aren't there to watch videos or play games or listen to MP3s. As a result, most business users simply don't need the kind of performance at work that they increasingly want at home.

Vendors know this and hope to make their profit margins with business buyers by selling less costly, less flexible computers more often. On machines like Compag's IPag and HP's E-Vectra (dubbed "small form factor" computers) the vendors integrate networking, graphics, and sound capabilities on the motherboard. Stylishly designed, but stripped of expansion slots, these PCs retail for less than \$800 without a monitor.

These nice-looking new machines are well suited for business and could be used at home, but they don't target the home market. The industry knows what you want there. A good time.

Ramon G. McLeod is executive editor for news at PC World. I



The fast lane is now open. People have the power to handle any task without breaking stride. And the faster people can go, the more time they have for the rest of their lives. Toshiba's new Tecra® 8100, pre-installed with the reliable

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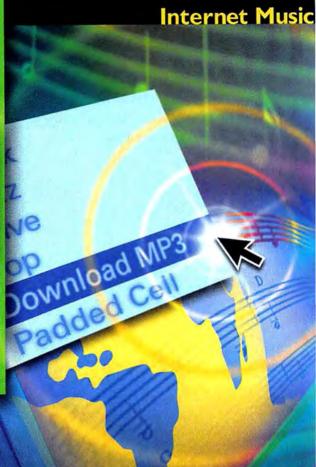
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the speed of the mobile movement is now cruising nicely at 700MHz

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#### LINUX FUN FOR EVERYONE?

YOUR ARTICLE ON Linux ["Is Linux Right for You?" May] underplays the difficulty the average user would have trying to install and configure this operating system on a PC. I consider myself quite proficient with a computer, but I spent 20 hours trying to get Linux configured properly and eventually gave up. IT professionals and Unix programmers may love Linux, but it's not ready for prime time.

Mark Kaiman, Seattle

IT'S NICE TO know that the Linux source code can be adjusted, but what normal consumer wants to chase code from some hacker to fix a glitch? Not me!

L. M. Craig, Knoxville, Tennesssee

FOR THOSE WHO say Linux is going to kill Microsoft, remember that Linux is "open software." If Microsoft is afraid of Linux, it only has to add one more box to your local software store's shelf. What will it say on the front of that box? "Microsoft Linux version 1.0." End of story.

Bobby Lane, Atlanta

YOU STATE, "So far, WordPerfect Office is the only major businessoriented application suite to cross the Windows/Linux divide." There is at least one other such suite: StarOffice from Sun. Like Linux, it's a free download.

Dave Comeau, via the Internet

#### **WARNING FLAGS ON ONLINE INSURANCE**

MAY'S Consumer Watch column ["Go Online, Get Insured"] did an outstanding job of perpetuating the myths that (1) insurance is a commodity to be purchased, at the lowest possible price; and (2) the agent is a useless middleman.

A good agent provides value-added service, is an insured's best advocate in dealing with the insurance company, and is a

> lot cheaper than an attorney in coverage disputes.

> > To make decisions that can potentially imperil every asset you own is like relying on drkoop. com to diagnose a severe abdominal or chest pain because it's cheaper than seeing a live doctor.

> > > Bill Wilson, Director, Virtual University of Independent Insurance Agents of America Hendersonville. Tennessee

HOT BUTTON

## E-Mail Spymasters Defended, Derided

YOUR STORY ON Project Echelon [Top of the News, May], the National Security Agency's purported program to intercept electronic communications, is trash. Why not print articles on how fluoride in the water is a government plot to control our minds?

Echelon is not a threat, if it's even real. Some wonk in Washington might think it's a great idea, but come on. They're not tapping the phone, they're not reading your mail, and Echelon is not sending a bunch of jack-booted thugs looking for you.

Alan Arvesen, Austin, Texas

NSA HAS BEEN computer-monitoring most if not all electronic communications (including phones) since about 1972. The keywords in phone conversations were at first merely flagged; if used frequently, a closer watch (still by machine) was then kept. Continued repetition within a certain time frame could finally trigger live surveillance. Encrypted communications also catch our friends' eyes.

Name withheld by request

YOU AND YOUR readers might find a historical account of the surreptitious NSA enlightening. The Puzzle Palace by James Bamford will astonish you regarding what this agency has done in the past (with and without presidential authorization). If you're not paranoid now, you will be after reading this book.

> David A. Odom. Edgewood, Washington

AFTER READING your article, I assume that this letter will go through the Echelon black box. But everyone knows that putting something on e-mail is like sending it on a postcard. That is why most businesses know better than to send sensitive materials through e-mail. Sometimes, to be secure from those who would do us harm, we must sacrifice a bit of our freedom. I, for one, hope that our government is searching through these e-mails.

> Todd A. Deem, via the Internet (off the southwest coast of Angola)

PAY CLOSE ATTENTION to the renewal rate, which could increase substantially. Also, many Internet-based carriers and direct marketers fail to offer homeowners insurance. If you pull your auto insurance out of the agency that also insures your home, you will likely lose an auto/home discount. And please give your agent the courtesy of at least trying to beat the new quote. Many times you'll find that something, however small, can be done.

> Jason Sheroan, R & R Insurance Elwood, Indiana

#### STOCK TRADING ONLINE

DOUGLAS GERLACH ["Trading Up," May] talks about Ameritrade having a rock-bottom trade commission of \$8. Then comes the fine print: Limit orders cost \$5 more. Making a trade at market rather than limit is absolutely stupid. Anyone buying or selling online who doesn't know the difference should put his money in CDs.

Richard Manganel, via the Internet

YOUR AUTHOR missed the boat with his comments about Datek Online. True, he does say Datek is straightforward and simple, but there's much more. As far as I know, Datek is the only source for free streaming stock quotes online, a service that can be customized for the information you want. As an active trader with accounts at several brokerages, I find Datek offers the best services for the lowest cost.

Charles Vanderford, Tampa, Florida

#### FAST ACCESS-FROM ONE PC

A SIGNIFICANT omission is in your article on fast Web access ["Broadband or Bust," May]. While cable and DSL services do offer a significant increase in access speed, you are limited to using one direct connected computer. I tried the @Home service from my local cable provider and discovered I could not access @Home from my laptop. I could have dial-up access to e-mail, for an additional charge, but not to the Web itself. This was a deal breaker for me, and I returned to my 56K modem and dial-up Web access.

Tom Fleming, Sarasota, Florida

#### DON'T WORRY, SPIELBERG

STAN MIASTKOWSKI'S excellent article on video capture and editing ["Move Over, Spielberg," May] is the best I have seen on this difficult, frustrating, but ultimately satisfying subject. Novice users may still be unprepared for the demands of video editing, however. For example:

1. Windows may crash when users try to run a video capture and editing package. In my case, I finally resolved the problem by using the Windows Update corrections that are available on Microsoft's Web site. 2. The article did not emphasize the need for disk drive speed. A slower drive will not capture rapidly enough, either dropping frames or requiring a slower capture rate with visible degradation of quality.

3. Be prepared to exit everything not needed to run the computer.

Barry Garsson, via the Internet

PC World welcomes your letters to the editor. Send e-mail to letters@pcworld.com.

#### CORRECTIONS AND CLARIFICATIONS

IN JUNE'S Top 10 Power PCs, the PC World-Bench score for the Quantex SM800 should have been listed as 148. (For this model's current, corrected ranking, see page 180.)

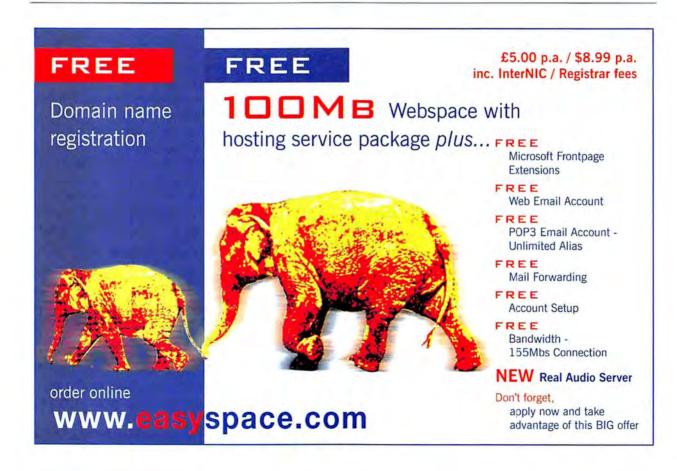
In "Hammer Time!" (June) the URL for Amazon.com's auction page should have been given as www.auctions.amazon.com.

Contrary to a statement in May's video editing roundup, "Move Over, Spielberg," the Matrox Marvel G400-TV card will continue to include Avid Cinema software.

In May's New Products, we should have said that Compag's IPag Legacy-Free has two USB ports in the front and three in the back.

In May's "Broadband or Bust," our costcomparison chart should have listed Media-One RoadRunner as a cable service.

PC World regrets the errors.





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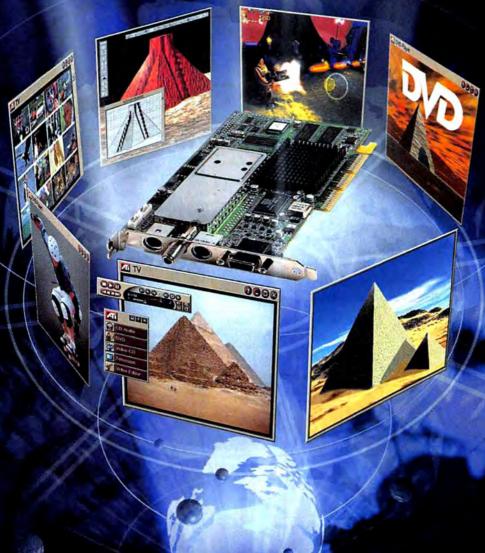
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# The 15-Minute **Expert Consumer**

Need facts fast? Visit these top Web sites for choosing doctors, contractors, appliances, and more.



WRITING FOR PC WORLD hasn't made me a household name or the target of autograph hounds. But it does help me keep in touch with friends and family-at least when they're shopping for computers. Even distant cousins call for technology tips and advice on the best PC deals. And I'm sure that lots of PC World readers get similar calls from folks they know.

No doubt about it, being an expert is great. But how do we deal with those areas of life we're not so well informed about? No problem-just turn to the Web. Hit the right sites, and you can arm yourself with the knowledge you need to find the right doctor, hire a good contractor, purchase an appliance, invest in a stock, or even ace a job interview. Becoming an expert won't cramp your schedule, either. Here are some essential sites that will make you an insufferable know-it-all in short order.

#### WHAT'S UP, DOCS?

I USED TO LEAVE the enormously important decision of choosing a doctor to random factors like location-geographic or in the Yellow Pages. Now, thanks to the Web, I can make an informed choice. Of course, there's still no substitute for a thorough interview with a prospective physician, but health sites are great places to find doctors who are worth considering.

WebMD.com, for instance, puts a database of half a million doctors at your fingertips. Tell the site your zip code and how far you're willing to drive; and then specify desired specialties, a preference (if you have one) for a male or female practitioner, and how many years of experience your M.D. should have. A list of doctors will pop up. Click on a name, and you'll get facts on affiliation, education, and residency.

At Healthgrades.com, you'll find a lot of stuff that's also available at WebMD, but you can limit your search to physicians who are boardcertified and have no sanctions against them. And while you're at the site, you can check to see how your local hospitals stack up and how good your health plan is.

If you run into trouble getting your insurance company to pay for a procedure because it says the price is excessive, arm yourself with statistical support by going to MyHealthScore.com and researching the cost of various medical procedures and how hospitals calculate charges. MyHealthScore.com also carries evaluations of doctors, dentists, and hospitals, but I found its ratings in these areas rather scanty.

#### STAY IN CHARGE OF RENOVATIONS

REMODELING IS A great way to increase the value of your house. It's also an enormous task that involves surrendering your home (and a good deal of your money) to a contractor you may barely know. So it's important to do your homework. The best way to find a contractor is to get a referral from someone you know-with a finished project you can look at. But if that fails, or if you just want to get competitive bids, take your search online at Contractor.com, Contractorlocate.com, Handymanonline.com, or ImproveNet.com. Keep in mind, however,

## Attention Philips or Hewlett-Packard CD Recorder Users

#### If You Currently Own or Have Owned a Philips Brand cdd2000 or cdd2600 CD Recorder or Hewlett-Packard Brand 4020 or 6020 CD Recorder

PLEASE READ THIS LEGAL NOTICE

The purpose of this notice is to inform you of a proposed settlement of a class action, Pacillo v. Philips Electronics No. America Corp., et al., as explained in detail in a Notice of Class Action Settlement, which you are encouraged to obtain and read in its entirety. If you currently own or have owned a Philips brand cdd2000 or cdd2600 CD Recorder or Hewlett-Packard brand 4020 or 6020 CD Recorder, you may be a member of the Class and your rights will be affected by legal proceedings in this action.

A "Settlement Hearing" will be held at the Hall of Justice. 101 S. 5th Street, Camden, New Jersey, in Courtroom 31 at 9:00 a.m. on August 17, 2000 to determine: (1) whether the proposed settlement of this action is fair, reasonable and adequate; (2) whether a final judgment should be entered dismissing the litigation on the merits as to Philips and Hewlett-Packard with prejudice to Plaintiffs and all members of the Settlement Class who do not timely request exclusion; and (3) whether applications to be made by Class Counsel for payment of fees and reimbursement of expenses and an incentive fee award to Plaintiffs should be approved by the Court.

Under the Settlement Agreement, Philips will provide Settlement Class Members with a repaired or replacement CD Recorder (or, for those class members who can demonstrate that such relief would not benefit them, rebates toward the purchase of Philips, Magnavox or Norelco brand products), five free blank recordable compact disks, and other benefits as more fully detailed in the Notice of Class Action Settlement.

You have a right to be excluded from the Class as detailed in the Notice of Class Action Settlement. If you wish to be excluded you must notify Class Counsel in writing, postmarked by July 31, 2000, at the following address: Jonathan Shub, SHELLER. LUDWIG & BADEY, 1528 Walnut Street, Philadelphia, PA 19102.

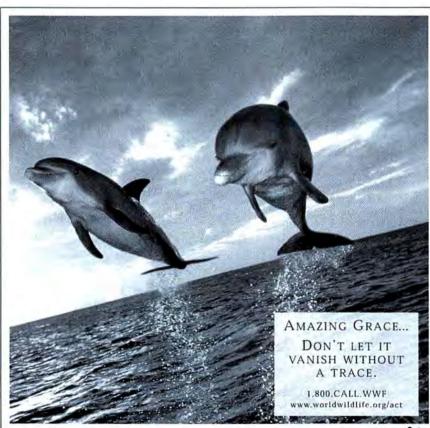
If you properly request exclusion, the terms of the settlement will not be binding as to you. If you do not request exclusion from the Class and the settlement becomes effective, you will be bound by the terms of the settlement.

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### CONSUMER WATCH

that you'll generally have to surrender information such as your address and budget, and you may not find anyone. (None of these sites could find me a contractor in my area initially, although Handymanonline did eventually put me in touch with a roofer.)

Even if you don't find your contractor online, you can get up to speed on household renovations at ImproveNet.com. The site provides an overview of the entire search, bid, contract, and construction process, and supplies invaluable tools for calculating what your remodeling job will cost. Those tools are a great way to double-check your contractor's initial quote and assess any additional charges that crop up. For instance, try changing materials (say, from granite to laminate) to see if your contractor is hitting you too hard for some last-minute changes to your renovation job. (Price gouging for project changes is a persistent problem in the contracting world.)

#### ARMED AND READY TO SHOP

IF YOU'RE BUYING fancy kitchen flooring-or if you just want a new big-screen TV—the Web can quickly prepare you for a battle with scary salespeople. First, point your browser to Consumer Reports Online at www.consumerreports.org. The venerable magazine's Internet home isn't free: A one-month subscription to its database of product reviews costs \$3.95, but it's well worth it. Don't forget to cancel the subscription at the end of the month unless you want the service (and billings) to continue indefinitely.

Consumer Reports Online is tops in my book, but a few other product comparison sites also deserve a visit, including Productopia (www.productopia.com), where in-house experts judge an array of products on features and style. ConsumerReview.com lets you see what other consumers think of items ranging from cars to cameras. Another possibility is EShop. com-Microsoft's remake of Comparenet.com, one of the Internet's oldest product comparison-shopping sites. At EShop. com you can click on Home Appliances to study product specifications, track down models that suit your require-

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.

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ments, and do side-by-side comparisons (some complete with product reviews).

Is the item you're shopping for a new or used car? If so, begin by checking Consumer Reports Online's reliability ratings for the model and year you have in mind. so you won't have to endure that horrifying moment when a sexy hunk of steel you've just purchased falls apart the minute you drive it off the lot. I also like the honest reviews and no-nonsense shopping advice at Edmunds.com and the budgeting tools at CarPoint (www.carpoint. com). You can check out average prices for used cars at both these sites, too.

#### TAKING STOCK

NOWADAYS IT'S HARD to go to a party without getting into a conversation about the stock market. Instead of shrugging and mumbling into your drink, hold forth with authority. There are a zillion and one sites for investors, but for my money (and time) only three are must-visits. For help

narrowing the dauntingly expansive investment universe down to stocks suitable for your particular portfolio-plus online tools to help manage that portfolio from day to day-go to SmartMoney.com. To learn about a particular company or a specific industry, pay a call to Hoovers.com. And for stock market analyses updated by investment experts throughout the day, visit Briefing.com.

Both Hoovers.com and Briefing.com have free sections that supply more than enough information for most prospective investors. If you find that day trading is your calling, springing for paid subscriptions to these two sites will give you access to in-depth information, such as detailed company financials and up-to-the-minute downgrades and upgrades.

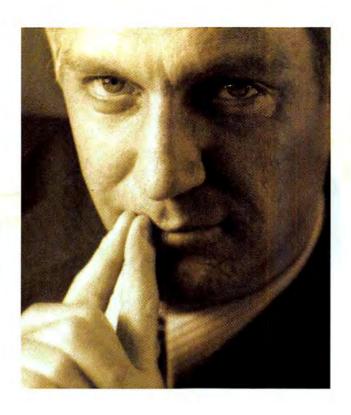
#### SNEAKY JOB SEARCHING

HAVE YOU HEEDED ads for job sites such as Monster.com and posted your résumé online? When someone from a company you've never heard of calls to schedule an interview, you can still wow the caller. Pretend you're in a meeting and put the caller on hold. Then head to WetFeet.com. This vast site identifies what the company does, when it started, and who it competes with. Back on the phone, drop a morsel or two to show your knowledge. Interview this afternoon? No problem, you say.

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Christina Wood is a PC World contributing editor.





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Best of What's New for Audio Video Category '99 - Popular Science - December '99 - Elura

'98 Best Gear - Men's Journal Buyer's Guide - Fall/Winter '98 - O Ward

The Best of '99 - Comcorder & Computer Video - September '99 - Faira

Vanguard Award - Video Systems - December '99 XII

## ALL DIGITAL CAMCORDERS RECORD HISTORY. OURS MAKE IT.

Editor's Pick - Best Product of the Year - Sound & Visian - January 198 - Optura

Digital Camera Category Winner - Technology Buyer's Guide - Time - November 199 - Ulturo

PC Computing Best '99 - PC Computing - July '99 - Elura

Video Grand Prix Award '99 - Audio Video Emernational - August San Flura

Editor's A-List Picks for Digital Camcorder Category - PC Computing - April '99 - Optura

Best of What's New for Audio Video Category '98 - Popular Science - December '98 - ZR

Editor's A-List Picks for Digital Camcorder Category - PC Computing - December '99 - Elura

Most Valuable Product for a gital Camera Category - PC Computing - January '00 - Elura

Camcording Product of the Year '99 - etown.com - November '99 - GL1

Digital Photographic Editor's Choice Award '99 - Petersen's Photographic - July '99 - Elura

Dealerscope's Editor's Choice - Dealerscope Viencary '00 - Elura

DV Award of Excellence - Digital Video - April '98 - XL1



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## Rebate, Rebate, Who's Got the Rebate?

PC WORLD READERS SEND me hundreds of letters each month about a dizzying array of raw deals. But one complaint is easily the most common: unfulfilled rebates. In just the past few months, I've heard from nearly 150 readers whose rebates are months overdue. Worse, some

of them won't ever receive their checks. The problem persists despite recent Federal Trade Commission actions. Earlier this year, the FTC reached a settlement with Memorex and Umax mandating that they pay their rebates in the stated time.

Why do so many companies fail to honor their rebate

promises? The most common excuse is inability to keep up with customer demand-which naturally begs the question, Why offer a rebate if you're not prepared to process it? Some companies attempt to handle the job themselves and fail to staff up adequately. More typically, they process rebates through fulfillment houses, where efficiency varies widely.



Here's how you can help ensure that you get the rebates you're promised. Include all of the required documentation when you mail a request, and keep copies. If the rebate doesn't arrive on time, contact the company in writing, enclosing copies of everything you sent. Some vendors also allow you to check the

status of your rebate online or by phone.

In cases of extreme rebate tardiness, consider filing complaints with the FTC, along with the state attorneys general and Better Business Bureau offices in both the company's state and your own. One last piece of advice: Never buy anything solely because of a rebate offer. Get the product you need, and if there's a rebate, consider it a bonus-once you receive it.

#### Heads Up...



Netscape's Name Game: I've been hearing lately from angry subscribers to Netscape's free WebMail e-mail service. It turns out that Netscape, in one of its recent acquisitions, also acquired some duplicate e-mail addresses. Its solution? Force current WebMail subscribers to change their addresses, or be denied access to their e-mail. Says one disgruntled user, "I'll change e-mail providers instead of being treated so shabbily"... Total Recall: Bidding at an online auction always involves an element of risk, but at least now it's easier to avoid buying a dangerous product that's been recalled. EBay and Amazon.com Auctions have added links to the Consumer Product Safety Commission's Web site (www.cpsc.gov), giving bidders easy access to information about recalls of products such as toys, tools, and exercise equipment. Regardless of where you do your bidding, check the CPSC site-before you bid-to see if the product you want is on the recall list... AMS Goes MIA: Things don't look good for Milwaukee-based notebook maker AMS Technology, Its phone lines have been disconnected, the Web site is gone, and my e-mail messages have gone unanswered. No word on where system owners can turn for service and support. Stay tuned...

#### LETTER OF THE MONTH



RECENTLY I ASKED Micron if there were any compatibility issues between Windows 2000 and the Micron Millennia Max system I bought last year. I was told that Micron would not provide support if I installed Windows 2000, and also that installing the OS would void all Micron warranties-hardware and software. If I

want Windows 2000 on a Micron system with Micron warranties and support, I must buy a new PC with that OS installed. I find this unacceptable.

> Benton Dexter Palm Springs, California

GOTTEN A RAW DEAL?

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

On Your Side responds: Micron Communications Manager Melissa Boyd says, "If a customer loads a retail version of Windows 2000 on his system, [Micron] would refer them to Microsoft for support of the operating system. The hardware will still retain [its] warranty....However, for diagnostic purposes, we may ask the customer to reinstall the

> ...operating system that shipped with his product." Micron is reevaluating the policy, says Boyd. This type of policy is common among vendors, so before you upgrade the OS, ask how the upgrade will affect the warranty.



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## Search Engines With a Soul

WHOEVER COINED the term search engine got it exactly right. Alta-Vista, Excite, and their rivals do indeed resemble engines: awesomely powerful but decidedly inhuman. Rather than speaking plain English, they comprehend only keywords, ANDs, ORs, NOTs, and punctuation

marks. Misphrase your query, and you | may get an avalanche of irrelevant links or no results at all. And even though a few

simple English, it's clear that you're talking to a none-too-bright automaton

sites let you ask questions in

But some sites now leverage the unbeatable technology known as the human brain. And although these features won't

replace searching as we know it, they're among the Web's coolest new tools.



PEOPLE-DRIVEN searching is showing up both at established sites like Ask Jeeves (answerpoint.ask.com) and LookSmart

(live.looksmart.com) and at new contenders such as Abuzz.com. At any of these sites, you can type a question in plain Eng-

> gory, and post it on a public message board for perusal by other visitors. You'll receive an e-mail alert if and when someone responds. Why would perfect strangers bother to reply to

lish, designate its cate-

your question? Mostly because it's fun to share and show off your knowledge. As I asked questions, I found myself pausing to answer others. There are also material rewards for superhelpful participants: LookSmart, for instance, awards Click-Miles that can be accumulated and cashed in for travel and other prizes.

#### GIMME FIVE

#### Sites for Bargain Hunters

CHEAPSKATES REJOICE! The Web is bursting at the seams with freestuff offers. These sites are dedicated to finding them; most also round up other bargain options, such as online coupons.

- 1. Nojunkfree.com: This admirably choosy site sorts free stuff (samples, trial offers, and more) by quality level-ignoring offers it deems unworthy of your attention.
- 2. FreeShop.com: A gargantuan collection of freebies and discounts, both on and off the Web; altogether more than 1000 neatly categorized items.
- 3. About.com's Free Stuff (freebies. about.com): The usual roundup of offersnew items listed daily-plus news, a message forum, and a freebie FAQ.
- 4. Top20 Free (www.top20free.com): A toteboard of free-stuff sites of all sortsnot just 20, as the name implies, but more than 200 contenders.
- 5. Hotdealfinder.com: Plentiful links to big-discount online coupons reward visitors who tolerate this site's downright ugly look and feel. (A makeover, in the works at press time, may spiff up its looks.)

#### On the Net...



Better Free Voice Mail: Many Web sites offer free voice-mail services, but EVoice (www.evoice.com) is the first I've seen that answers the phone line you've already got when you're unavailable. The catch: You must listen to a brief ad before you can retrieve messages by phone. You can avoid these audio ads, however, by checking your messages on the Web... Try Before You Buy: Visit a nifty new site called Runaware (www.runaware.com), and you can testdrive software applications right in your Web browser-no downloads required. At press time, the only major Windows packages available were a few Corel products, but more may be up by the time you read this... PointCast Signs Off: Remember PointCast? Once among the Web's hottest offerings, the news-and-ads screen-saver service was quietly discontinued in late March, Its successor-EntryPoint (www. entrypoint.com)-crams news, a stock ticker, searching, and even MP3 playback into a trim toolbar. It's worth a gander.

I posted questions at Abuzz, Ask Jeeves, and LookSmart, and within just a few hours I got smart tips about buying a mountain bike online and learned where Grover Cleveland was born (Caldwell. New Jersey). Very impressive. But the sites are not foolproof: Your question could get addressed slowly (or not at all), and some of the answers are inaccurate. frivolous, or downright insulting.

#### **REAL PEOPLE, RIGHT NOW**

OF COURSE, WAITING even an hour or two for an answer sounds mighty tedious compared to the lickety-split response times that you get with traditional search engines. Enter Webhelp.com, which brings while-you-wait service to peopledriven Web searches. Once you have

asked a question, you're connected to a professional Web surfer, who immediately searches for a Web site that has the information you're after. When the live rep has tracked down pertinent info, the page in question gets displayed in a browser frame for your approval. Once the session is complete, you receive an e-mailed transcript for future reference.

#### SHAKEN, NOT STIRRED

WEBHELP'S BASIC SERVICE is free, but for 99 cents a question or \$10 a month, you can jump to the front of the line and receive the fastest service. I opted for the free version; my search sessions took from 5 to 10 minutes apiece, and I always went away happy. A representative named Hale, for instance, swiftly pointed me toward a recipe for the trendy cocktail known as a Cosmopolitan (1.5 oz. vodka, .75 oz. Cointreau, 1 oz. cranberry juice; shake with ice, strain into a cocktail glass, and garnish with a wedge of lime).

Feeling lazy? INetNow.com, another new service, doesn't even make you type queries into your browser. Instead, you dial a toll-free number and chat with a real person, who surfs for answers then and there. I found the reps prompt, genial, and accurate, whether I was checking Mark McGwire's stats or tracking down a neighborhood Mongolian restaurant.

At press time, INetNow.com planned to give new users a free trial but to charge for ongoing access, starting at \$20 a month. It might be worth the bucks if you plan to take advantage of INetNow.com's full complement of services: The phone representatives will give you stock quotes, shop on your behalf, tend to your calendar, and even read your e-mail to you.

I'm intrigued, for sure-but not quite ready to entrust the people at INetNow with my e-mail password. Moreover, some of us may prefer to query an emotionless, nonjudgmental search site such as Yahoo. Hey, I know I'd be too sheepish

ACCORDING TO A NEW SURVEY, typical Internet users will spend 1 million minutesalmost two years of their lives-online, (Let's hope it's not all at once.)

SOURCE: CYBER DIALOGUE

to seek human help if I were trolling the Web for, say, information on baldness cures or photos of Catherine Zeta-Jones (not that I am, mind you).

Come to think of it, what makes many Web searches so rewarding are the random, unexpected detours that you take along the way. Such semi-aimless Internet wanderings would quickly shatter the patience of the good folks at Webhelp and INetNow, no doubt-but I've never heard a traditional search engine whine, "Are you done yet?"

Contact PC World Senior Editor Harry McCracken at websavvy@pcworld.com.

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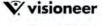






















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Fast Tricks for Slow Printers

SATURDAY IS USUALLY my day for futzing in the garden. I know it's unfathomable, but I do attempt to avoid technology at least one day a week. It rarely works.

I can easily hear the phone ringing from inside the house, and usually it's my mother asking to speak with someone in the IS department (guess who). Last time she called about her laser printer. Seems the contraption wouldn't print more than half a page of her 2-page file before freezing up. No wonder. Her document was crammed with half the images in her E 10,000-item clip-art collection. The printer had a

hearty laugh and promptly went on strike.

I've dealt with a lot of Mom's printer problems over the years and have learned a couple of esoteric tricks that can help make a printer work faster. (For more ideas, see Hardware Tips, page 228.)

#### COLOR IT GRAY

THE FIRST TRICK involves color ink jet printers. A little disclaimer first. I've never liked color ink jets. Sure, they're cheaper than laser printers, but they're also slow and noisy and have a voracious appetite for ink cartridges. And unlike with lasers, you can't physically modify an ink jet to make it work faster (more on that in a sec).

But you can trick an ink jet into speeding up, and save a few bucks in the process: Turn off the color. Yep, it's that simple. See, unless color is crucial for your document, you're wasting ink and slowing down the printer if you output in color. Test it. Print a color page, then print it again in gray-scale. To do this, go to Start-Settings-Printers and right-click on the printer's icon. Go to Properties and find the tab that lets you change from color to gray-scale. Then print the page again. The

Color ink jets are cheap, but they're also slow and noisy, and they have a voracious appetite for ink cartridges.

file I tested took more than 2 minutes to print in color; the gray-scale version took only 30 seconds. When you do need color, simply change the settings back.

#### BEEFING UP YOUR LASER

IF YOU USE a laser printer, you'll identify with Mom's problem. Whenever she tried to print files loaded with images, the document either wouldn't print at all or broke into multiple pages, with images on some, gibberish on others. I fixed this by increasing her laser's RAM. Increasing RAM not only sends documents flying out of your printer like bits through a DSL line, but it also lets you add more complex images to files without the printer rebelling.

Here's how it works: All laser printers come with memory-generally SIMMs, the same type of RAM your PC uses. (Ink jets don't use RAM; the document's held on the PC and spooled to the printer.) Unfortunately, manufacturers are stingy and include only 1MB or 2MB of RAM in their laser printers, just enough to print an average document. But you can supplement this with more RAM.

If you have an old PC lying around, open the case and you'll see two or more 1- by-4-inch memory chips on the motherboard. Just release the clips on either side of the SIMMs and transfer them to your printer. (But be careful not to touch any metal part of the SIMM; static electricity will destroy it.) That's how I upgraded my prehistoric Hewlett-Packard LaserJet 5P. In less than 5 minutes, I upped its memory from 2MB to 26MB by adding three old 8MB SIMMs. The most daunting part wasn't inserting the SIMMs —it was finding where to put them in the printer, something your manual can tell you. You can also buy RAM on the Web at about \$18 per 8MB SIMM (try www. pricewatch.com). Keep in mind that, depending on the laser you have, there is no guarantee you'll be able to add

memory. Check your manual or the vendor's Web site. And be sure to unplug the printer before you fiddle with the RAM.

#### PRINTING BUDDIES

OKAY, YOU'VE SOLVED your own printing woes, but what happens when you send a document to a buddy who doesn't have the originating program-and can't print it out? Try EFax Messenger Plus, a brilliant free utility that works even with really obscure programs (www.efax.com).

When you want to send a document to a friend, simply go to the print menu and choose Messenger Plus from the list of printers. The utility creates a file that you can then send to anyone via e-mail. When your friend receives it, a built-in printerand-viewer feature lets them print the document exactly as you sent it.

Well, now that your printer's running smoothly, I've gotta go. Mom's paging the IS department about a scanner problem.

PC World Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. You can reach him at Steve\_Bass@ pcworld.com.

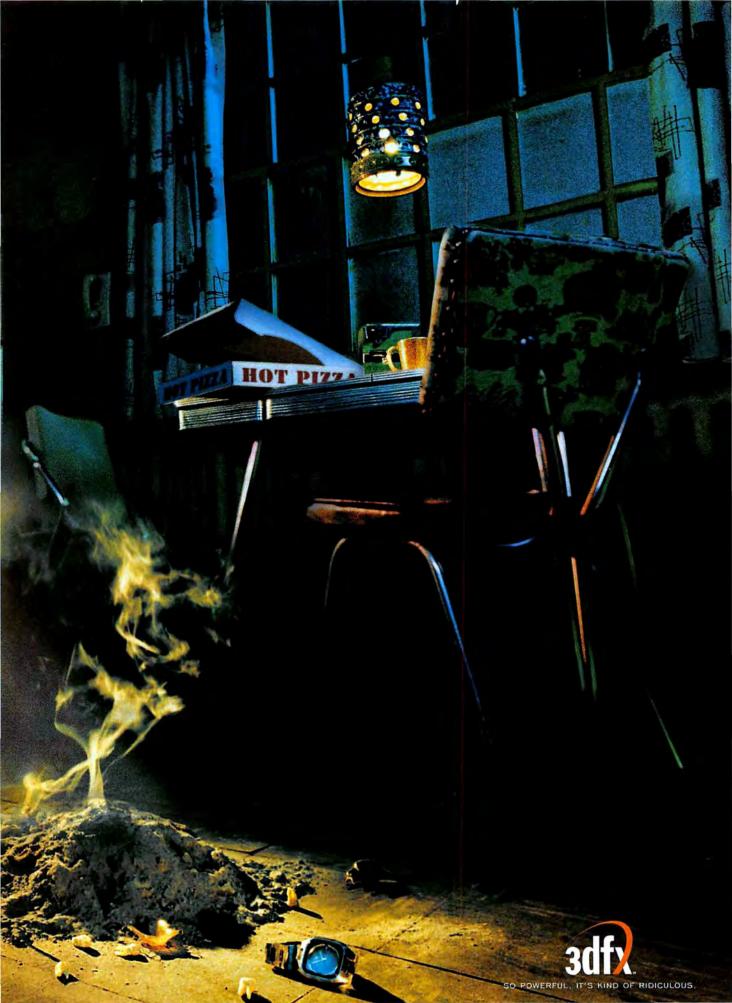


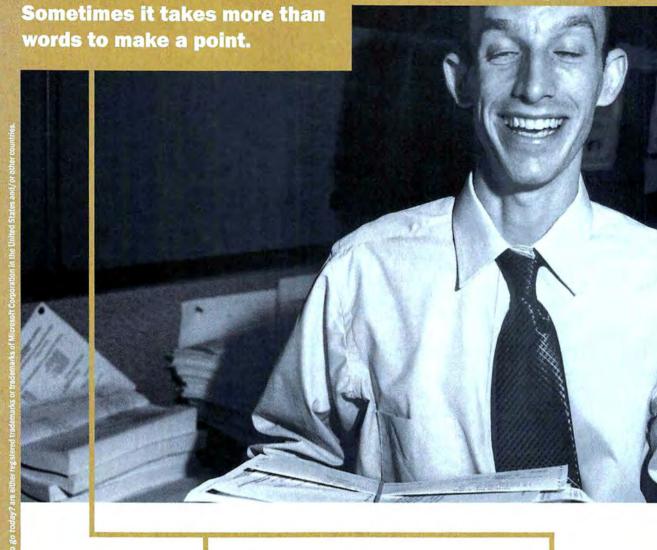
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#### Microsoft security patches • Office 2000 SR-1 update • Corel Office 2000 fix

## Microsoft Patches Allow Safer Surfing

IN CASE YOU missed it, Microsoft recently got caught with its proverbial pants down: The phrase "Netscape engineers are weenies!" was found embedded backward in the Web server software included in Windows 95 and 98, Windows NT 4.0 Option Pack, and FrontPage 98.

Some security experts feared that the phrase (included in a file named Dywssr.dll) opened a back door to Web servers running Microsoft software. The company denies that the prank itself made the software vulnerable. But Micro-

soft confirmed that coincidentally the .dll file opens two security holes, though these holes affect only Web servers. The fix? Find all instances of Dywssr.dll by conducting a search for the file on your PC, and delete each occurrence of the file. The only feature you lose by getting rid of this file is the ability to create "link views" or maps of your Web site to check for invalid links.

Meantime, Microsoft has been busy patching two other security holes that threaten users who surf the Web and use e-mail. B U G Beware file attachments from unknown sources. including Excel files. Normally, Excel warns you before you open

a file that contains a macro. But an attacker can defeat the Excel 97 and 2000 warning system by embedding Excel 4.0 macro language commands in an external text file. If you receive one of these spreadsheets, opening the file or clicking an internal link could allow a destructive Excel macro to run without warning, altering or deleting files on your hard drive.

The patch won't let macros run unannounced. Excel 2000 users need to update to Microsoft Office Service Release 1, available at www.officeupdate.com/2000/downloadDetails/ O2kSR1DDL.htm. For a link to a 2.8MB fix for Excel 97, with installation info, hop to www.officeupdate.com/downloadDetails/ Xl8p9pkg.htm?s=/downloadCatalog/dldExcel.asp.

B U G You could find yourself staring at the "blue screen of death" simply because you read an HTML e-mail message or visited a Web site, due to a flaw in the way all versions of Windows 95 and 98 handle file path names. To leave you feeling (and seeing) blue, an attacker need only embed a file link that includes

HIT BY THE RECENT "love bug"? Tell us about it-or any other hardware or software bug-via e-mail at bugs@pcworld.com.



#### Windows 2000 Shuts Out MSN

USERS OF THE NEW OS found that they couldn't use their Windows 2000 PCs to set up new MSN accounts. And to use an existing MSN account under Win 2000, users had to configure dial-up Internet access and e-mail manually. Microsoft recently released version 5.1 of its MSN CD to solve the problems. Current MSN members can order the free disc at free.msn.com/upgrade.asp; to order the CD if you aren't a member, visit www.free.msn.com.

#### WordPerfect Office 2000 Repairs

A SCANT FOUR MONTHS after releasing its Service Pack 2 for WordPerfect Office 2000, Corel has released SP3. To get the free 76MB download, use the links at www.corel.com/support/ftpsite/pub/ WordPerfect/wpwin/Office2000/index.htm.

more than one DOS device name, such as C:\COM1\COM1. When Windows comes across a path name that contains a single DOS device name, it ignores the path name and treats it as invalid. Unfortunately, Windows doesn't simply discard multiple DOS device names in the same way. Because your system chases after path names that don't exist, it ends up crashing.

The patch makes Windows recognize file path names with more than one DOS device name as invalid. If you use Windows 98 or Windows 98 Second Edition, download a 228KB fix at www.microsoft.com/downloads/release.asp?releaseID=19389. A 267KB fix for Windows 95 is available at www.microsoft.com/ downloads/release.asp?releaseID=19491.

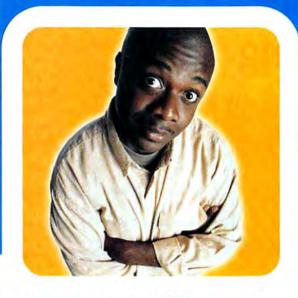
#### OFFICE UPDATE GETS ANOTHER CLEANING

MICROSOFT'S FIRST SERVICE release (SR-1) for Office 2000 is supposed to solve problems for users of the popular suite. But as we reported last month, installing SR-1 caused problems for some users. Microsoft has promised to post a revised version of the release (named SR-1a) to address the most serious problem. Users who installed SR-1 after upgrading from Windows NT 4.0 to Windows 2000 experienced a variety of glitches, like nonworking hyperlinks. Windows 2000 users who have already installed the SR-1 update and have endured the resulting hassles can download a fix from download.microsoft.com/download/ office2000pro/09regfix/2000/WIN98/EN-US/09regfix.exe. For additional information, go to Microsoft's article at support. microsoft.com/support/kb/articles/Q258/5/49.asp.



Find files from this article at PCWorld.com's FileWorld (www.fileworld.com/magazine). Mitt Jones is a contributing editor for PC World.

## "Trying to



### Get the speed YOU need.

If you've been holding out for the cable or telephone company to bring high-speed Internet access to your neighborhood, chances are it's been a while. Which is a shame, because if you'd chosen

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#### It's easy.

How do you get started? Just visit us at www.direcpc.com to find a retailer near you. If you can't find a store in the neighborhood, call us at 1-800-DIRECPC. We'll send you your dish, satellite modem, software and everything else you need. We can arrange professional installation for you, too. Either way, getting started is just a phone call or a mouse click away.

#### How does it work?

The engineers at Hughes figured out that the real bottleneck in the speed of the Internet wasn't the request **out** to the Web — telephone modems handle that just fine. Everything slows down when the Web tries to use the telephone system to send you **back** the media-rich information you requested. So, we use a much faster satellite connection for sending you the Web content you want. Check out the diagram — this is the system that makes DirecPC the fastest Internet access available nationwide.





#### DirecPC gets pushy.

Sure, you love the idea of surfing the

Web at up to 400 Kbps. But what if you could get your favorite Web sites and Usenet Newsgroups delivered straight into your PC by satellite - automatically, without even having to tie up your phone line to ask for them? That's just what DirecPC's Turbo WebCast™ and Turbo NewsCast™ services do — so you're never behind on the news and information that's important to you. The best thing about these two services? They're free with your paid subscription to any Turbo Internet™ service package.



#### The good news.

No other high-speed Internet access provider offers so much for so little. Take a close look at our service pricing - we're sure you'll find a package you like.

Service Plan Details	Resid	Business	
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Price of Service Plan (Without ISP)	\$19.99/Month	\$34.99/Month	\$109.99/Month
Hours of Service (Availability)	24 Hours a Day	24 Hours a Day	24 Hours a Day
On-Line Time (Hours of usage for Turbo Internet)	25 Hours /Month	100 Hours/Month	200 Hours/Month
Additional Hourly Rate (Including ISP) Additional Hourly Rate (Without ISP)	\$1.99/Hour \$.99/Hour	\$1.99/Hour \$.99/Hour	\$1.99/Hour \$.99/Hour
DirecPC Services			
Turbo Webcast: Broadcast delivery of popular Websites to your PC's hard drive	Included	Included	Included
Turbo Newscast: Broadcast delivery of up to 30,000 Usenet Newsgroups to your PC's hard drive	Included	Included	Included
Turbo Internet: Fully interactive access to the internet at speeds up to 400Kbps	Included in Online Time	Included in Online Time	Included in Online Time
Free E-mail Accounts	1	1	4
Networking (Number of Seats)	N/A	N/A	4

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## P OF THE E Windows 2000: The First

#### By Scott Spanbauer

PEOPLE MOSTLY say the same things: It's the best version of Windows yet. It never crashes. I love it! Now if only it supported my scanner...

Melding the stability of Windows NT with Windows est business-strength operating system is flying off the store shelves, selling 1.5 million copies in its first two months. The fact that it is outselling all versions of its NT predecessor suggests that it

must be winning some converts from Win 95 and 98.

To see how well Windows 2000 has delivered on Microsoft's promises, we informally polled PCWorld.com visitors on their experiences with the upgrade. Most of them were happy with Windows 2000especially with its stability. Almost unanimously, they reported none of the system crashes and performance-sapping memory errors so common with Windows 95/98. A few noted that (like its Linux



#### DISPATC

We asked readers to share their first impressions of the new OS: good, bad, or ugly. Upgraders love

100 Days

the stability and power, but they hate the installation hassles.

rival) Windows 2000 had not once required rebooting.

The catch, though, is in getting Windows 2000 installed. Whereas Windows 9x embraces just about any hardware configuration it meets, Windows 2000 raises red flags right and left. And since the new OS comes with fewer hardware drivers than Win 98, your chances of a rocky installation are pretty good.

Most Web site visitors we polled reported compatibility problems or installation glitches with Win 2000. Because drivers for older products are

a low priority for many hardware makers, our survey participants often were planning to maintain dual-boot PCs so they could switch between Win 2000 and Win 98 when hardware incompatibilities arose. A few had given up on Windows 2000 completely.

#### GOOD VS. EVIL

SEVERAL READERS wished that Windows 2000 were cheaper, but when we asked if they would buy it again having gone through the upgrade, the

overwhelming majority said yes. Though a few mentioned improvements to the interface and new under-the-hood features, the chief reason given for their approval was Windows 2000's stability: Most users said they'd never experienced a single crash, freeze, or lockup-a welcome change from the frequent reboots required with Windows 98.

International Data Corporation vice president Dan Kusnetzky says that the corporate users he surveys report



#### **Product Pipeline**

- > Can't Stop the Music: Nomad Jukebox from Creative Labs stores over 100 hours of digital music (MP3, WMA, and WAV formats) on a device the size of a portable CD player. Due out in midsummer, the Jukebox will cost \$599 retail, \$499 from Creative's Web site. A USB interface provides fast connectivity, setup, and digital transfer rates.
- ➤ Legal Linux DVD Player: Watch for the first legal DVD player software for Linux this fall from InterVideo. The software, Lin-DVD (expected price, \$30), will allow DVD movies to be played on a computer with a DVD drive, without requiring an expensive hardware decoder card. Current Linux DVD players are unlicensed and unauthorized by the industry consortium that controls DVD technology.

#### **Tidbytes**

➤ Broadband Without Wires: Sprint Broadband Direct, introduced this spring in Phoenix, offers high-speed Internet access for \$40 a month-without a cable or DSL hookup. Customers get a 13.5-inch-by-13.5-inch diamondshaped antenna connecting to a special modem inside the same building; the antenna must be in line of sight of a radio transmitter. The service commonly delivers at 1 to 2 mbps and lets a user send at up to 256 kbps.



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your browser to www.pcworld.com/pcwtoday.

#### A for Stability, D for Audio



much the same thing: Windows 2000 is reliable, stable. and a good performer. "On those issues. Microsoft seems to have hit right on the mark," says Kusnetzky.

But to achieve such satisfaction, upgraders must first navigate an unpredictable and occasionally rough installation process. Scott Murray, a software developer in Vancouver, British Columbia, installed Windows 2000 on his office computer with nary a hiccup. So when he decided to try it on

Name: Dave Matthews Location: South Bend, Indiana Profession: Macromedia Flash animator What he liked about Windows 2000: Never required rebooting: Lock Computer, Task Manager, and other controls are available by pressing <Ctrl>-<Alt>-<Delete>. What he didn't like: Buggy audio drivers constantly popped and crackled; updated drivers locked up system.

his home PC, he wasn't prepared for the nightmare that followed. "Everything seemed to be going smoothly," Murray recalls, "but after the system had copied the necessary installation files to the hard disk and rebooted, I received an error message that stated the 'ntkrnl' file was corrupt." Murray rebooted and reinstalled the OS from scratch but ran into the same error.

After replacing the CD-ROM drive, trying a different Windows 2000 CD, running hard disk diagnostics, and repartitioning and formatting the drive, Murray still got the error. He finally traced the problem to the system's motherboard. At the motherboard manufacturer's insistence, he installed several BIOS updates that eventually left his computer totally unusable.

"I got painted into a corner, so I did what any customer who has enough money does," he says. "I went and

bought a competitor's product." With the new motherboard in place, Murray was able to install Windows 2000 without major problems.

Murray's experience isn't unique. According to Austin Watson, president of TTCX-The Test Company in Bellevue, Washington, some PCs are simply "evil" while others are "lucky." Watson, whose company performs Windows Hardware Quality Labs testing for Microsoft and hardware vendors seeking the "Designed for Windows" logo, has seen his share of recalcitrant systems and devices. "We have an older laptop that I put in the 'evil machine' category,"

## Essential Tool Kit for Win 2K Upgraders

ABOUT TO BITE the Windows 2000 upgrade bullet? Before you do, take a glance at these update tools, Web sites, and downloads.

#### **GENERAL INFORMATION**

NT Compatible: Get the latest user-supported scuttlebutt on what's now working under Windows 2000-and what's not. www. ntcompatible.com

Windows 2000 Compatibility Updates: This mini-service pack makes Windows 2000 compatible with 48 different applications. most of them games, www.microsoft.com/ windows2000/downloads/deployment/ appcompat

Windows 2000 Readiness Analyzer: This free 2.6MB utility download tells you how

well both your hardware and your software will fare under Windows 2000 before you buy it. www.microsoft.com/windows2000/ downloads/deployment/readiness

#### DRIVER AND SOFTWARE UPDATES, INFORMATION

Adaptec DirectCD for Windows update: www. adaptec.com/support/advisor/cdrupdates/ dcdwinversions.html

Adaptec Easy CD Creator update: www. adaptec.com/support/advisor/cdrupdates/ ecdcversions.html

HP LaserJet/Windows 2000 compatibility: www.hp.com/cposupport/printers/support\_ doc/bpl07374.html

HP ScanJet/Windows 2000 compatibility:

www.hp.com/cposupport/scanners/support\_ doc/bps03528.html

lomega Parallel Port Drive update: www. microsoft.com/windows2000/downloads/ recommended/q251381/default.asp IomegaWare 2.2.1: The Windows 2000-compatible version, www.iomega.com/software/ featured/windows2000.html

Palm Desktop Software and Product Compatibility With Windows 2000: www.palm. com/support/helpnotes/win2k.html

PartitionMagic 5.01 upgrade: www.partitionmagic.com/updates/pm501updates.html Symantec Products/Windows 2000 compatibility list: service1.symantec.com/ support/tsgeninfo.nsf/DOCID/20000 11107215039

he says, adding that the manufacturer told him to give up on trying to install Windows 2000 on the laptop. Meanwhile, he was nicely surprised when the operating system installed like a charm on an aging Toshiba portable. "It's the best-working OS I've ever put on that laptop," he says. Although there's no easy way to tell if your PC is a Windows 2000 lemon, Microsoft has posted a list of systems known

#### HARDWARE HANG-UPS

to be compatible.

SOMETIMES THE overall Windows 2000 upgrade goes fine, but specific components don't work right. Dave Matthews of South Bend, Indiana, gave up on Windows 2000 after experiencing loud pops and clicks in the Macromedia Flash animations he creates Matthews tried to trace the problem to his PC's Creative Labs Sound Blaster Live audio card, whose drivers were installed automatically by Win 2000. He found updated drivers on Creative's Web site and installed them-to

"Those nasty things locked up Windows 2000 completely," he recalls. Matthews had to restart his PC in Safe Mode to remove the new drivers. After scouring news-

his immediate regret.

groups for help, he realized that simply reverting to Windows 98 Second Edition was an easier solution. A Creative spokesperson said the company hadn't heard of the problems Matthews experienced.

The problem in cases such as this, explains TTCX's Watson, is that hardware developers scrambling to create new drivers for Windows 2000 can't just reuse existing Windows 95 or 98 driver code, which by now is comparatively mature and stable.

Readers were often dissatisfied with Windows 2000's video-card drivers as well, noting that many support Microsoft's Direct3D but not the OpenGL spec required for high-end gaming. Inveterate gamer Steve Watts of Westerville, Ohio, claims that Windows 2000's implementation of DirectX-Microsoft's audio and graphics-acceleration technology used primarily in games-contains a serious bug: When a game running on his PC in full-screen mode

Microsoft recognizes that power users and game enthusiasts may benefit from Windows 2000, but they

> crashes, he can't get back to Windows 2000's graphical interface to take control and kill off the frozen game.

use the OS at their peril.

A Microsoft spokesperson could not comment on the specifics of the DirectX problem, except to emphasize that Windows 2000 is intended as a business product. Microsoft recognizes that power users and game enthusiasts may

realize advantages from Windows 2000, but they use the OS at their peril. The company is sending a decidedly mixed message, however: Many of the first Windows 2000 updates on Microsoft's Windows Update site focused primarily on game compatibility (see

"Essential Tool Kit for Win 2K Upgraders" on page 56.)

#### STORAGE SNAFUS

WINDOWS 2000 users have also encountered two major problems in the area of storage. The

OS works fine with most of Iomega's popular Zip drives, but the company's parallelport models weren't sup-

ported until Iomega released updated software. Users of Adaptec's Easy CD (software for recording CDs) must upgrade to version 4.02 to burn discs under Windows

2000. Worse, an error in the DirectCD packetwriting driver (which lets you treat a CD-RW drive like a hard disk) resulted in one of the few "blue screens of death" reported under Windows 2000. (Adaptec has since fixed the

bug via updated drivers.)

But the largest pieces missing from the Windows 2000 hardware puzzle-in our informal survey, at least-seem to be printers and scanners. Our survey respondents reported that a wide variety of both types of peripherals did not work as expected (or at all) under the new operating system. Furthermore,

#### DISPATCH

#### Site to See: Raging Search

ALTAVISTA, the granddaddy of Internet search services, wants to reclaim its edge with a new engine, Raging Search (www. raging.com). The site has minimalist design and no banner



ads; it caters to search-thirsty throngs who want faster, more relevant results, and links without a megaportal experience.

#### Top PC World Downloads

#### O Clean System Directory

72KB, 16,606 downloads

Saves disk space and improves system performance by helping you move unused DLL files.

#### @ AdsOff

1.51MB, 13,895 downloads

Accelerates browsing by automatically removing banner ads. Optional filter setting disables pop-up windows.

#### **⊗** X-teq X-Setup

2.69MB, 13,196 downloads

Customizes your Windows environment; Wizards help personalize icons, edit boot options, and stop automatic program loading.

#### All Icons

3.66MB, 11,244 downloads

Over 4000 full-color icons for Windows 95.

#### O DirectX 7.0a

6.19MB, 10,181 downloads

Microsoft's upgraded 3D technology improves force feedback and input device compatibility.

Download files can be found on www.pcworld.com/fileworld/top5.

HOTOGRAPH: STUART MCCAL

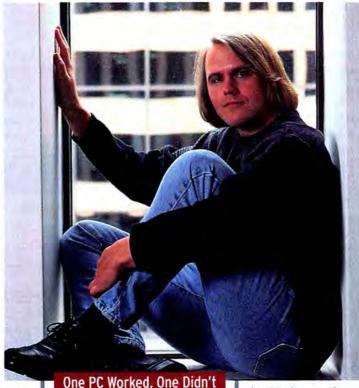
some manufacturers have stated firmly that they will not be dedicating scarce development resources to creating drivers for older and discontinued devices, many of which were developed for Windows 3.x/9x and had never even run on Windows NT.

The people we polled also reported that plenty of applications failed to run under Windows 2000-from antivirus programs to games to the software that syncs a desktop computer with a Palm device. In many instances, software developers have already posted their

own Windows 2000 compatibility updates. In situations where product-update patches are not available, users are left with only two alternatives: Give up the application altogether, or dual-boot between Windows 98 and Win 2000.

#### ARE YOU PROFESSIONAL?

THOUGH the steady stream of new drivers and compatibility updates is making the upgrade to Windows 2000 easier, Microsoft and its systemvendor partners don't seem terribly interested in selling the operating system to home and small-office users. According to Naila Seif, director of strategic alliances for Compaq's Commercial PC Computing Group, Windows 2000 is the flagship OS on Compaq corporate machines but is available on only two of its retail systems-both geared toward small businesses. Similarly, while Dell offers Win-



Name: Scott Murray Location: Vancouver, British Columbia Profession: Software developer What he liked about Windows 2000: Installed smoothly on office PC; supports larger NTFS partitions.

What he didn't like: Nightmarish installation on home PC; third-party hardware makers' lack of knowledge about Windows 2000, coupled with their lack of support for the OS.

dows 2000 on all its businessoriented OptiPlex and Latitude PCs (and on its Inspiron notebooks), availability for its consumer Dimension desktops is spotty. In general, PC vendors appear to be sticking with Microsoft's vision of which computers should ship with Windows 2000 and which with Windows 98.

By fall, Compag and Dell will undoubtedly offer Microsoft's Windows Millennium Edition (aka Windows Me) on their consumer machines. The latest operating system in the Windows 9x line, Windows Me promises greater reliability than Windows 98, along with a few new features to attract upgraders (see "More Thrills, Few Thrills," www.pcworld.com/ junoo/millennium).

IDC's Kusnetzky, however, predicts flat growth for Windows

Me as businesses move to Windows 2000-or choose to wait instead for its successor. Code-named Whistler, that version should appear at the end of next year.

#### AN OS TO COUNT ON

IF WINDOWS ME continues Windows 98's legacy of compatibility at the expense of stability (which wouldn't be surprising, considering that it still uses Windows 98's shaky code base), tech-savvy consumers may pass it up as well. More than one of our survey

participants bristled at the seemingly arbitrary distinction between consumers and business users. "I have no patience for the constant errors that I encounter using Windows 98," states Stephen DiLorenzo of Rochester, New York. "I have been told over and over that an NT-based OS is for businesses, but I think home users are just as entitled to stability and reliability. A person surfing the Web and someone creating a spreadsheet are both entitled to operating systems that run without constant glitches."

Compaq's Naila Seif grudgingly agrees. "Reliability," she says, is something that everybody cares about. Consumers at home need even more reliability because they don't have an IT organization to support them."

Whistler may put an end to the 98-versus-NT dilemma by combining the best of both operating systems. But if you don't want to wait, the early reports on Windows 2000 are generally favorable. Just do your homework first: Make sure that your PC and its BIOS, peripherals, and applications are listed as compatible on Microsoft's Upgrading to Windows 2000 site; also check the manufacturers' sites, which may have morecurrent information. When in doubt, make a full backup, uninstall any products known to be incompatible, and pray that the rest are lucky, not evil. If your installation problems boil down to one unsupported peripheral, you may have to decide which you like more: the new OS or the pesky hardware. Scanners are pretty cheap these days-you can always buy a new one.

## IBM and Maxtor Set Sail With Massive 60GB and 75GB Hard Drives

UPDATE BETWEEN HUGE presentations and irresistible MP3 audio files, most of us are maxing out hard drives like never before. But just as we were drowning in downloads, to our rescue come two huge new drives-IBM's 75GB Deskstar 75GXP and Maxtor's 6oGB DiamondMax 6o. Both of them promise speedy passage across a sea of large files.

When it comes to storage capacity, the IBM beats the Maxtor and every other IDE hard drive on the market today. With 75GB of storage space, the 7200-rpm IBM Deskstar nearly doubles the capacity of the previous generation of desktop hard drives. It also features glass platters, which are less prone to noise vibration and less likely to warp from heat than standard aluminum platters.

For a good deal, the Maxtor is the way to go. Even with its slower 5400-rpm rotational speed and aluminum platters, it's still a better buy at \$329, costing a little over half as much as the \$625 IBM.

At \$5.48 per GB, the Maxtor also beats today's least expensive 20GB, 5400-rpm drives, which go for \$120, or \$6 per GB. The IBM works out to \$8.33 per GB—expensive even for a 7200-rpm drive.

#### TEST CRUISE

I TOOK THE 3.5-inch drives on an informal test cruise using a 300-MHz Celeron PC with a Promise Ultra66 interface card. Overall, both drives performed a tad quicker than current IDE hard drives.

The IBM-thanks to its 7200-rpm rotational speed and 8.5-millisecond random access time-ran Windows 98 navigation tasks a bit faster than the Maxtor, which has a 9.5ms random access time.

Maxtor, however, ran a bit more quietly than the IBM.

Both drives have features designed to prevent damage. Maxtor's are slightly more impressive. Its ShockBlock technology is rated to withstand up to 250 Gs (the force of gravity) of nonoperating

\$261.84 Cheaper by \$250 the Gigabyte: \$225 Hard Drive Costs \$200 Falling Rapidly \$175 HARD DRIVE VALUES just keep \$150 getting better. Longtime PC \$137.94 users will remember when \$1 # \$125 per megabyte was considered a breakthrough. Now it looks like \$100 we'll approach \$1 per gigabyte \$75 by 2003. \$69.68 \$50 \$29.30 \$25 \$6.46 \$3.402 \$1.822 \$1.152 \$13.09

Source: International Data Corporation, Storage Hardware Research Group, 1 Average cost per gigabyte for IDE hard drives in desktop PCs. 2 Projected estimate.

The IBM also opened apps a little more speedily.

But in transferring files, the Maxtor took the lead. I transferred a folder with 430MB worth of files (each averaging about 100KB) across partitions, and the Maxtor finished the task 2 seconds ahead of the IBM. Although you won't notice a difference in day-today tasks, those couple of seconds can come in handy if you're transferring lots of files.

I heard little or no noise when running the drives. The

shock—impressive for a hard drive that's designed to be used in desktop computers.

#### A FEW CAVEATS

BEFORE you buy, take note of a few hard-drive foibles. With all your data in one vessel, a drive failure means you can lose all your valuable data at once, and recovering it can be expensive. Drive Savers recovery service, for example, charges a minimum fee of \$1200 for a 60GB or 75GB unit, compared to \$600 for a 20GB

model, says Drive Savers representative Nikki Stange.

In most cases, you won't easily be able to back up one of these drives unattended, because no single desktop backup media even approaches the capacity of these drives. It would take about four 20GB Travan 20 (TR-5) or two 40GB DDS-4 DAT tapes to back up one 75GB hard drive filled to capacity. Your best bet for keeping data safe is to use a second hard drive on your PC.

And when you consider the cost of purchasing two drives, the Maxtor DiamondMax 60 looks even more attractive.

#### A PEEK AHEAD

IN TERMS OF overall value. there's simply no contest-the Maxtor is the best choice. However, the impressively designed IBM, with its glass disc platters and ultrahigh capacity, provides performance advantages.

For basic PC use, it's hard to imagine filling these drives to the brim, though even largercapacity drives are under way. But some vendors, including Quantum and Seagate, think few buyers want 75GB or higher capacity in a desktop.

By next spring, says Danielle Levitas, International Data Corporation's research manager of storage devices, the maximum platter capacity will increase from 15GB to 20GB, which means that 100GB IDE hard drives are just beyond the next iceberg.

—Jon L. Jacobi ▶

#### **IBM Deskstar 75GXP**

Street price: \$625; 888/426-5214; www.ibm.com/harddrive

#### Maxtor DiamondMax 60

Street price: \$329; 800/262-9867; www.maxtor.com

## Power Shopping: Can You Trust E-Commerce Review Sites?

#### CONSUMER ALERT

EVERYONE HAS an online shopping horror story. Orders that disappear. Products that never arrive. With thousands of e-merchants, how do you find the ones you can trust?

A growing number of companies aim to help, rating Web stores by using criteria such as features, selection, and service. They deliver the ratings online, for free. But keep your eyes open. Among the major merchant raters, we found key differences.

Sites such as BizRate and Reseller Ratings rely on consumers to rate online stores. Others, like Shop Online 123. employ analysts to examine sites. Gomez Advisors and RatingWonders do both. The sites share some drawbacks. Most cover only a fraction of the Web's stores. Many favor positive reviews. And some sites do a poor job of preventing ballot box stuffing.

#### THINK POSITIVE

THE OLDEST and best-known rating site, BizRate (www. bizrate.com), publishes rat-

ings on more than 1000 Web merchants it chooses to review, from car rental agencies to clothing stores. (About four out of five merchants have asked to be reviewed, the company says.) BizRate derives most of its ratings by surveying people who've bought at a merchant's site.

Consumers who buy at a BizRate affiliate see a pop-up survey asking them to rate site navigation, selection, prices, and shipping options. Later, consumers receive an e-mail asking whether the product arrived and how satisfied they were with the shop-

ping process.

But this approach has one big problem, says Steve Cook, a senior vice president for Greenfield Online, a Webbased research firm in Wilton. Connecticut: It can't capture the opinions of people who gave up before they reached the checkout counter.

"The people who were frustrated by the site, who never

found what they wantedthey never have the chance to be intercepted [by the survey]," explains Cook. "That Jomission) gives you a little more of

a positive spin on the sites."

About 87 percent of stores selling desktop PCs received BizRate ratings of four stars or higher. In home audio, 88 percent of stores scored that high; among music vendors, 96 percent rated four stars.

Davis says that some mer-

ries, such as on-time delivery.)

chants pay BizRate a commission for referring customers to their sites. But he says the firm's ratings are "purely objective." The site makes most of its money by selling research data to online merchants. Because e-tailers must agree to incorporate BizRate's survey into their shopping carts, he explains, only the best merchants ap-

ply. "If you are a good site, you want to be on BizRate. If you are not a good site, we're going to reveal that pretty quickly," he says.

Some big sites like Amazon.com and Dell don't participate in BizRate's point-of-sale surveys. To rate those vendors, BizRate polls a panel of consumers who've done BizRate surveys on other e-merchants. Here, too, negative ratings are almost nonexistent.

BizRate is not the only bearer of good news. Shop Online 123 (www.shoponline123.com) takes a different approach, but its results are only slightly more critical. Instead of surveying consumers, the site's team of surfers buys products from selected vendors, returns them, and rates the sites on service, selection, and the like.

But the lowest rating any



### Behind the Scenes at E-Merchant Ratings Sites

RATING SERVICE	Number of sites rated '	Who does the rating		- American	
		Consumers	Editors	Pros and cons	
BizRate www.bizrate.com	1000	•	0	PRO: Ratings by consumers who actually bought products. CON: Almost every site gets an overall ranking of at least four stars out of five.	
Gomez Advisors www.gomez.com	500	•	•	PRO: Customized ratings for PC buyers such as beginners and bargain hunters. CON: Consumer satisfaction ratings are easy to manipulate.	
RatingWonders www.ratingwonders.com	15,000	•	•	PRO: Huge database of stores, wide range of ratings. CON: One person can review the same store repeatedly, though only once per day.	
Reseller Ratings www.resellerratings.com	1200	•	0	PRO: One-stop shopping for hardware and software vendors. CON: Weak safeguards against ballot-box stuffing; redesign will correct that.	
Shop Online 123 www.shoponline123.com	250	0	•	PRO: Editors buy and return products, then review sites. CON: Limited number of rated sites, no negative reviews.	

• Yes O No

'Approximate, as of May 1, 2000.



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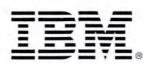
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site can receive is Fair. About 250 e-tailers are currently reviewed on the site; according to editor Dave Kurns, nearly three times that number have been evaluated

"What we've done is only give you the good stuff, " says lackie Leo, vice president of interactive media for Meredith Corporation, which owns Shop Online 123. "We don't want to waste your time with sites we think aren't valuable."

Leo says that while the site receives commissions for some customer referrals. those deals are struck only after reviews have been written, to avoid influencing the reviewers. Shop Online 123 makes most of its money from print advertising-it's also an annual publication sent to subscribers of other Meredith magazines such as Better Homes and Gardens.

The problem? If a store isn't on the list, you don't know whether it was deemed bad or hasn't been rated. Among sites all rated positively, it's hard to choose.

Also, while the Web enables raters to garner feedback from thousands of consumers, it

also can make it easy for smaller e-tailers to alter the scores.

Reseller Ratings. which focuses on computer hardware and software vendors, allows you to rate any e-mer-

chant-even some that don't exist. Simply register, choose the merchant name from the site's list or submit the name of a new merchant, and answer seven questions. Scores are averaged, and the store is rated between o and 7.

If you register again using a different name and e-mail address, you can apparently vote as often as you like. We were able to review a fictional company three separate times. (The site removed this data after we notified it.) And in fairness, it's tough to weed out all fake submissions from clever spoofers.

#### **VOTER FRAUD**

HOWEVER, not all vote fraud goes undetected. According to Scott Wainner, founder and site manager of Reseller Ratings, the site caught employees of one vendor stuffing the ballot box-and awarded that vendor a zero rating. Wainner says this behavior is rare, but adds that the site is undergoing a redesign that includes "a more effective system of checks and balances." It should be complete by June.

Perhaps the most balanced approach is to provide both editorial reviews and consumer surveys. Gomez Advisors (www.gomez.com) rates more than 600 sites based on objective criteria, such as payment options, on a scale of 1 to

'Consumer rating systems can be prone to bias due to determined people's ability to spoof them.' -Julie Ward

> 10. For each of the rated vendors, Gomez also provides a survey that users can fill out, anonymously; results are combined to form a separate consumer rating of poor, acceptable, or excellent.

> We were able to comment on one e-tailer several times by hitting the browser's Back but-

Rating 💝	Store Name	Special Offers	▼ OnTime ▼	
****	buy.com		98	SHOP
XXXXX	Office Depot		98	SHOP
****	Outpost.com	5 0 5 3% rehate	98	SHOP
ARRAK	eCOST.com		98	SHOP
****	PC Connection Online Superstore	sos 3% rebate	98	SHOP
***	Multiwave Direct		99	SHOP
****	CDW Computer Centers		98	SHOP
****	Computers4SURE.com		98	SHOP
****	Computer Geeks Discount Outlet		98	SHOP
XXXXX	J&R Music and Computer World		98	SHOP
****	NECX Computer Marketspace		97	SHOP
****	TechStore, Inc.		98	SHOP
****	IC-Direct		98	SHOP

▲ BIZRATE.COM'S online merchant reviews don't bear much bad news. In our spot check, 87 percent of desktop PC sellers rated four stars or better.

RATINGWONDERS.COM'S "average consumer ratings" reflect more criticism: Access Micro is rated 2.5 lamps out of out of 5. ▼

Top Rating: 👻 👻 👻						
Access Micro Store's Overall Ratio	Click on a Category Report	for Full				
14252 CULVER DRIVE #A- 300 , IRVINE, CA, 92604 Tel: 949-851-8128.	Categories (1 to 5 of 5)	Rating				
Tall free: 800-906-6868 Fax: 949-651-1012 Email: CORPORATE@ACCESSMICRO.COM Store's Own Description AccessMicro.Com is an online computer superstore offering more than 45,000 products worth over a billion dollars in inventory. We ensure customer satisfaction by pricing our products as closely as possible to wholesale cost.	1. Mac Software 2. Macs	****				
	3. Overhead projectors					
	4. PC Software 5. Personal Computers	*****				

ton and resubmitting the same survey. This repetition had no effect on the vendor's objective score but it did change the consumer rating.

"Our feeling is that consumer ratings systems can be prone to bias due to the ability of determined people to spoof

> them," says Gomez representative Julie Ward.

Like BizRate, Gomez makes money by selling data to e-merchants and by generating customer leads from sites offering deals to its members.

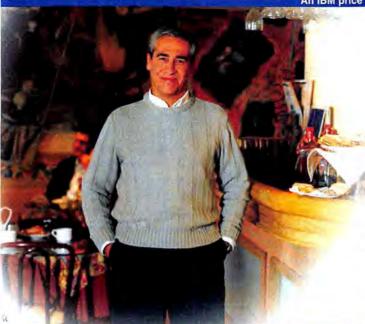
RatingWonders (www. ratingwonders.com) uses objective criteria to assess over 15,000 stores (using a system of one to five lamps), but consumers gauge the store's actual performance. For example, PC superstore Access Micro gets four lamps for overall shopping features, but consumers give it only two and a half lamps. The site accepts no commissions from stores; it makes money by licensing its data to shopping portals and from minimal advertising.

As with Gomez, we submitted several surveys on one company, from one address, in a single session. But only one of the comments was posted. Fahad Syed, vice president of RatingWonders, says the site usually accepts only one review per person per day.

#### **BROWSER BEWARE**

USING AN e-commerce rating site is better than shopping blind. But based on what we found, you should compare merchants across several ratings sites. Caveat emptor applies more than ever-not just to Web retailers, but also to the sites that rate them.

-Daniel Tynan



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## Auction Payment Sites—What Do You Know About Who's Holding Your Money?

#### CONSUMER ALERT

IF YOU FEEL uneasy about sending a large check to a stranger for something you bought at an online auction, you're smart and not alone. Of the thousands of online fraud complaints fielded by the National Consumers League last year, 87 percent concerned Internet auctions.

Enter online escrow services-neutral third parties that are supposed to make online transactions safer by acting as an intermediary between buyer and seller. Online escrow services are par-

ticularly attractive if you're buying or selling an expensive or irreplaceable item and want some added security. But not all these services are created equal. As we discovered in our research, many of these outfits aren't licensed or regulated.

The authorities have started to take notice. California, one of the first states to address the licensing issue, passed a law that took effect January 1, holding Internet escrow companies to the same regulatory standards as their offline counterparts. The results so far have been modest: Only 2 of the 22 escrow companies known to be doing business in the state are licensed, and 3 others are in the process of getting licensed. The others have either refused to comply or haven't responded to the state's demands.

As of press time, neither California officials nor representatives from the National Consumers League had received any reports of fraudulent online escrow companies. Still, the potential for abuse is there.

But not all online escrow sites agree. "Their laws aren't could wind up stuck with it.

The time-tested strategy of paying with a credit card also has limitations. Most individuals can't accept credit cards. Services like PayPal that allow individuals to accept credit cards don't require users to have any more than a usable e-

mail address to receive pay-

a good fit for escrow companies outside of California, and I think they're overly strict," says Ken Thompson, president of SecureTrades.com, an escrow business based in Michigan. "They're trying to apply a law written for real estate escrow companies in California to any Internet escrow company based outside California."

#### **CURRENT EFFORTS**

TYPICALLY, online auction sites make some effort to protect their customers. Auction giant EBay insures all transactions against fraud for \$200. But you are not compensated for bigger losses, and if you buy a product that doesn't live up to your expectations, you

ments into an account. This protects sellers, but not buyers. For instance, if someone offers to sell you a Ming vase collection, they could collect your payment anonymously and never deliver the goods.

#### THE ESCROW OPTION

LIKE TRADITIONAL escrow services, an online escrow service helps manage the completion of a purchase between two parties who don't know one another. Where the offline services typically manage a relatively low volume of very expensive properties (such as homes), the online services help large numbers of buyers and sellers who use online auctions or classified ads to buy relatively low-cost items. And most online escrow companies operate at Internet speeds, using a number of automated processes to close the sale in a matter of hours. or a few days at the most.

Some services offer a money-back guarantee if the buyer doesn't come through with the money, or if the seller never ships the product. The services require both the buyer and seller to register for the service with a credit card, and the buyer usually pays for the product up front. The seller then either sends the product directly to the buyer, using a shipper like Federal Express that tracks shipments, or to the service itself. If the buyer finds the product to be as advertised, the escrow service pays the seller either by check

> or by direct deposit (less the service's transaction fees).

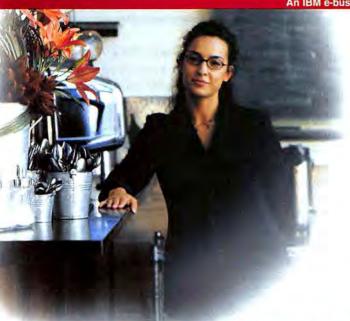
> > If the buyer never receives the product, or if it fails to meet

the buyer's expectations, the escrow service helps the two parties negotiate a new deal, or it makes sure that the buyer gets a refund and returns the product in resellable condition. Either way, the escrow companies "guarantee" that neither the buyer nor the seller can defraud the other. Some services also say that they carry insurance policies to cover losses to either the buyer or the seller.

The sense of security the services offer does not come cheap. Typically, escrow companies charge a hefty 2.5 to 5 percent of the purchase price.

#### **ESCROW WATCHERS**

UNTIL RECENTLY, Internet escrow companies haven't been required to prove



#### **NOTEBOOKS**

#### **NEW THINKPAD A20m**

Mobile Intel® Pentium® III processor 500MHz²

12.1" active matrix display

64MB SDRAM 6GB' HDD

24X-10X\* CD-ROM

Mini-PCI 56K2 V.90 modem

ThinkLight keyboard light Ultrabay™ 2000

Microsoft® Windows® 98 Second Edition

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SuccessLease™ 573/MONTH7

#### **CUSTOMIZE YOURS:**

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lomega Zip 250MB External USB Drive \$179° or \$7/month<sup>7</sup>

#### **NOTEBOOKS**

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their own trustworthiness. Most didn't register with any state authority, submit to audits or financial inspections. subject their employees to thorough background checks, or even keep surety and fidelity bonds that protect a customer's cash in case an employee or manager steals it.

To address the potential risks to consumers, the California legislature amended the state's escrow laws. The new law makes it illegal to operate as an unlicensed escrow agent.

If any party in an escrow transaction-the buyer, the seller, or the escrow serviceis based in California, the service needs a license. The benefit to consumers is clear: If a licensed business commits fraud, the California agency that oversees escrow companies can seize control of the business before more money is stolen. But they can do little about an unlicensed operation. "Once [a fraudulent business has] absconded with the money, the chances of you getting it back are negligible," says Julie Stewart, spokes-

If you deal with an unregulated escrow company, you may have nowhere to go with your complaints.

> person for the California Department of Corporations.

Earlier this year, Louisa Broudy, an assistant commissioner at California's Department of Corporations, sent letters to more than 20 Internet escrow services asking them to either apply for a license (which would subject their operations to scrutiny) or stop offering their services to California shoppers.

So far, California has licensed only two escrow companies, IEscrow and Escrow. com. (At press time, three others were completing required employee background checks

and paperwork.) That means most Internet escrow companies didn't comply or didn't respond to initial contact letters and have been sent a strongly worded Desist and Refrain Order, a stepping-stone to legal action.

"The message we want to get out is that [consumers] need to do their homework, and make sure that an escrow service they plan to do business with is properly licensed, whichever state it's in," says Department of Corporations

representative Stewart.

#### NOT FOR EVERYONE

SO WHEN SHOULD you even consider using an escrow service? If you're the buyer, you might want to employ one if the seller can't accept a credit card or if the value of the purchase is more than you are willing to risk losing. If you are the seller, you might deal with a service if you want some legal recourse in case the deal goes sour after you've shipped the goods.

Of course, before you use any online escrow business, call or e-mail the service and ask whether it's licensed to operate as an escrow service. And if you're not certain that an Internet escrow service is up to snuff, you can call the California Department of Corporations (203/576-6201) or the National Fraud Information Center (800/876-7060).

-Andrew Brandt

CABLEFREE Net-

band account.

Blaster and its cards

let PCs share a broad-

## Share a High-Speed Net Connection—Wirelessly

#### FIRST LOOK

LET'S START with two assumptions: First, you have, or hope to get, a DSL or cable modem for broadband Internet access. Second, you have more than one PC in your home or small business, and they're not in the same room.

How do you share a broadband connection between multiple, physically separated computers? You could rip up a few walls and run cable, but you (or your landlord) might prefer something a little bit less invasive.

New products from Cayman and SOHOware offer a solution: Attach the computers via a wireless network, then connect this network to the Internet with a gateway device that lets you share Net access. But don't expect that the process will be easy-or cheap.

#### A GATEWAY THAT'S NOT A PC

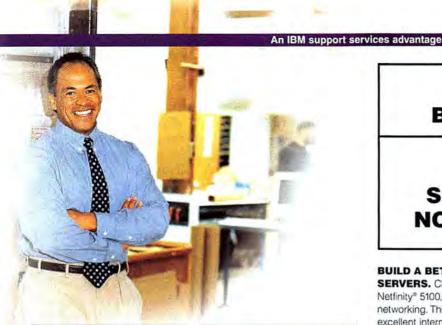
WHEN YOU GET basic DSL service, the Internet service provider expects to see one computer on your end, with which it communicates via an assigned identifier known as an Internet Protocol number. When you add computers, you have to either buy additional IP numbers from your ISP (which can increase your monthly service fee significantly), or fool the ISP into thinking it's still dealing with a single computer. A gateway does the latter. It communicates with your service provider via a cable or DSL modem, then makes sure that incoming and outgoing data goes to the right machines on your network. Windows 98 SE's Internet Sharing Software could handle the job, but that solution requires the computer with the broadband hookup to be on at all times so other computers on the network can

Divvying up Internet access is the just the beginning of what a gateway can do. SOHOware's Broadband In-

access the Internet.

ternet Gateway (BIG for short) is also an ethernet hub, allowing you to wire four

> computers together. The box has other useful features, including a fire-



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wall (which you can punch through for online gaming) and parental control tools. It is extremely easy to set up, and a shipping unit worked like a charm in our tests.

Want to go totally wireless? Proxim's \$399 Symphony Cordless Ethernet Bridge transmits data directly from a modem to a Symphony wireless network. It's definitely the way to go if you already have a cable or DSL modem and do not need more than a very simple wireless setup.

But what if you already have

a wired network at your small business, or at your home, and you want to add the flexibility that wireless offers?

#### WIRED, MEET WIRELESS

SOHOWARE'S \$200 Cable-Free NetBlaster ethernet/wireless bridge allows you to connect an ethernet device, such as a hub, or the BIG, to a wireless network. Unfortunately, it works only with SOHOware's proprietary CableFree wireless network cards.

The CableFree system is also poorly documented and hard to set up. For instance, the installation requires you to enter the last 6 digits of an 11digit NetBlaster ID number. It's easy to misread the instructions and attempt to enter the entire number. If you do, the installation program will happily accept the first 6 digits-and your network won't work. Once it was properly set up, however, the CableFree network worked without problems in our tests.

#### PRICEY AND POWERFUL

IN CONTRAST, the Cayman Systems 3220HW puts everything you need into one box. It's a DSL modem, an ethernet hub, a wireless bridge, and an Internet gateway. The only elements not included are wireless network cards. The 3220HW supports both the new Home RF standard and Proxim's Symphony wireless networking products, but it does not support the faster 11mbps 802.11B standard.

Because Cayman Systems' 3220HW includes a modem, it will be sold primarily by DSL service providers as an upgrade to the single-PC modem offered at installation. You probably won't want to buy it directly from Cayman, which charges an outrageous \$998 and does not include adequate documentation for do-it-yourselfers.

While pricey, the 3220HW has several attractive features. It works with wired and wireless devices, and advanced users will like its configuration options. For example, the builtin firewall lets you specify which devices on your network should be visible to the outside world-useful if you have a fixed IP address and want to run a small Web server.

We tried out the Cayman 3220HW with a Proxim Symphony network and found the setup to be fairly straightforward. Simply tweak your Windows network settings and complete the configuration (including device-specific security) using a browser.

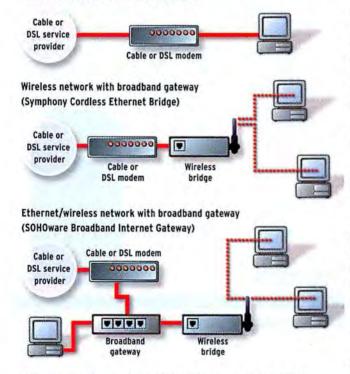
If you've been planning to set up a wireless network, and you already have broadband service, the SOHOware and Proxim Symphony products are worth considering. Look into Cayman's 3220HW if 1) you're an advanced user and haven't already paid for a DSL modem, 2) you'd like to share broadband over a wired and wireless network, and 3) your Internet service provider offers the product at a substantial discount from its stratospheric list price. If you would like a speedier network, consider waiting for the first gateway products that support the 802.11B wireless home networking standard.

Wireless broadband-sharing technologies are unlikely to drop much further in price anytime soon, and setup can be daunting. But once you get one up and running, you'll never want to go back. And you'll put an end to all the squabbles over who gets to surf on the DSL line.

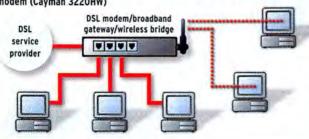
-Lincoln Spector ■

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Standard broadband connection to one PC



Ethernet/wireless network with broadband gateway and built-in DSL modem (Cayman 3220HW)



#### Broadband Internet Gateway, CableFree NetBlaster

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www.sohoware.com

#### Cayman 3220HW

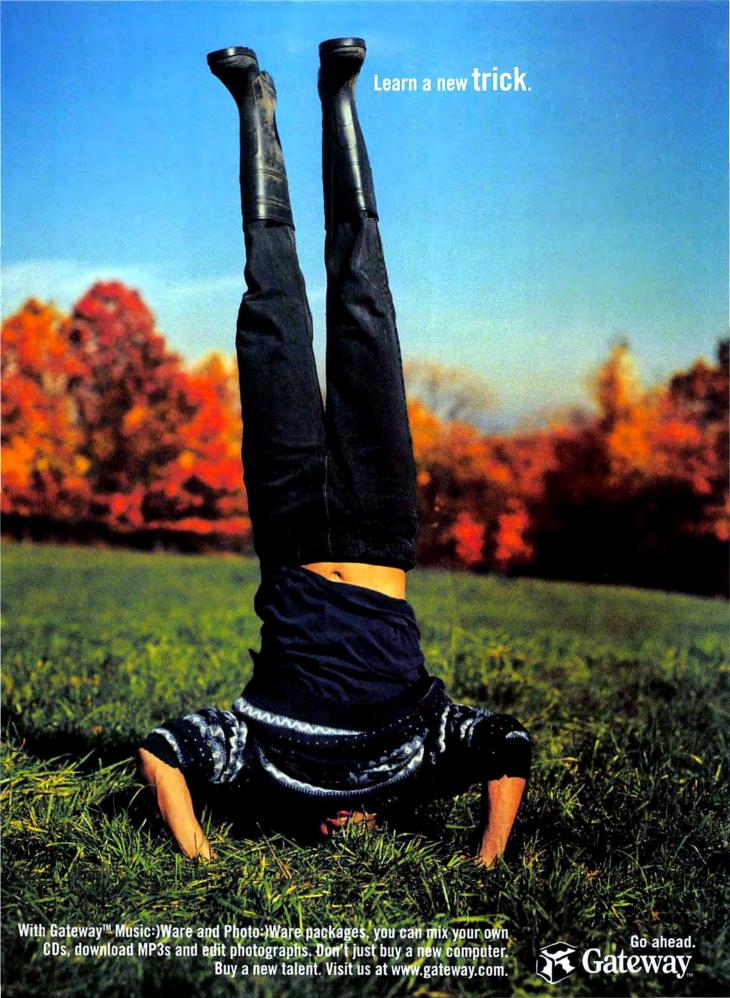
Cayman Systems; 800/473-4776;

www.cayman.com

#### Symphony Cordless Ethernet Bridge

Proxim; 800/229-1630;

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Darren Thierry at home, working on his growing business, GolfCrafters.com.

IKE MANY MOBILE MANAGERS, DARREN THIERRY LEADS A DOUBLE LIFE. As a senior marketing manager for an Austin, Texas-based computer manufacturer, he travels nationwide twice a month to demonstrate his company's server and storage systems to prospective customers. But at home, Thierry has been parlaying his passion for golf—a game he took up just eight years ago—into Internet revenues through his own fast-growing business, GolfCrafters.com.

Thierry builds custom clubs at his home in Austin, where PCs and printers buzz beside loft and lie

machines, swingset scales, and frequency meters. The combination works well. Internet sales have been climbing steadily since Thierry won the Golfsmith Distinguished Clubmaker Award in 1998. "Anybody can mix up some epoxy and glue this stuff together," he says. "You have to have the right tools and software, like DSFI [a shaft selection package from Dynacraft Golf Products Inc.], to stand out from the rest."









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Even at home, marketing responsibilities come before clubmaking, and Thierry prides himself on his ability to keep his day job and GolfCrafters.com apart. He uses his road gear—a laptop and Palm Pilot—to handle his work duties, and counts on his 350 MHz Dell Dimension XPS at home to manage the GolfCrafters Web site. "I try not to mix the two," Thierry says. "If you try to do sideline work on the PC at your office, you run into all kinds of

driver and software conflicts. It can get really messy."

Thierry "hammers" his Dimension XPS every day with Microsoft Office 2000 Premium applications (Microsoft FrontPage and Microsoft Outlook see the most action). He also makes quick work of payments and invoices with Financial Freedom Billing Manager Pro, a software package developed by M&R Technologies Inc. "I'm using every bit of the 128 MB of RAM I've got on that machine," he says.

And while he has not yet decided what to do about it, Thierry is running out of hard disk space—fast. One option is Castlewood Systems Inc.'s ORB 2.2 GB Removable Media Drive, which stores up to 2.2 GB of data on 3.5-inch disks—more than any other drive in its category. The ORB is also the fastest removable media drive on the market. With a 12.2 Mbps maximum sustained



The ORB 2.2 GB Removable Media Drive

data transfer rate, it is suitable for storing high-resolution images, Web documents, and multimedia files—even digital video.

#### [LACK OF] SPEED KILLS

Thierry credits WebPosition Gold, a site-promotion tool from FirstPlace Software Inc., for recent increases in GolfCrafters.com's traffic, but says he couldn't run the software without a dedicated, high-speed Internet connection. WebPosition Gold helps users to build and submit Web pages to major search engines, and then tracks their ranking against competing sites over time. "WebPosition Gold is awesome," he says, "but it can take up to an hour to complete a mission [a set of multiple tasks]. So I'd be dead with a stan-

## Home-Office Profile

WHO: Jeff Naticchia, custom publishing manager for a leading cable television programming guide.

#### BUSINESS CAPSULE:

Naticchia travels to cable companies nationwide to create new guides and develop marketing campaigns to boost circulation.

#### WHAT HE DOES AT HOME:

As soon as he finishes his expense reports, Naticchia is off and running—for up to two hours a night—with Indiana Jones and the Infernal Machine, an action adven-

ture game from LucasArts
Entertainment Co. Naticchia also
battles the evil Guardian in *Ultima IX: Ascension*, the role-playing epic
from Electronic Arts. "These are
massive games, with entire
Internet cultures built around
them," he says. "But I prefer to be
self-contained. It's one of those
rare moments in the day that I'm
not on the Net."

WHAT HE USES: Naticchia plays at home on a 667 MHz Dell Dimension XPS with 128 MB RAM, 20 GB of hard disk space, and a 32 MB NVIDIA TNT2 Ultra AGP video card. But he draws the line on gaming peripherals. "All I need is a full keyboard to play my adventure games," Naticchia says. "Besides, I think I'd be embarrassed to have a steering wheel attached to my computer."

ADVICE FOR GAMERS: Leave the laptop at the office. "The big thing with gaming is to have a fast processor, a big screen [Naticchia uses a 19-inch Sony Trinitron monitor], and a kick-ass video card," he says. "And those are definitely not standard equipment on most laptops."

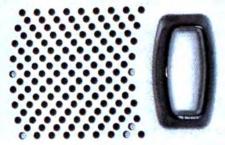


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dard phone line."

Thierry routinely uploads product photos to his Web site, a task that often caused his former dialup connection to time out. He now uses a cable modem, which—despite slowdowns caused by the growing number of cable users in his neighborhood—"is still three times faster than a 56K modem, even on its worst day." (DSL, which is unaffected by neighborhood traffic, is unavailable at Thierry's location.)

Home-office users who surf the Net regularly should consider getting a high-speed data connection. "It depends on the kind of access you have on the road," says Fredric Paul, vice president for content programming at AllBusiness.com, an online resource for small businesses. "If you're not working on the Internet a lot while traveling, you should get a high-speed connection to make your time at the home-office more productive."

For managers who do surf the Net while on the road, Merlin, from Novatel Wireless Inc., enables data communications from virtually any location. This wide-area wireless Type II PC card modem takes advantage of the Cellular Digital Packet Data (CDPD) network to ensure quality coverage and high transmission speeds. Merlin's Wireless Configuration Wizard and Wireless Modem Manager help users to set up service and monitor



#### The Plus U3-1080 palm-sized digital projector

Mobile marketers—whose Palm Pilots are never more than a heartbeat away—can now stuff an entire projector into their coat pockets. PLUS Corp. of America's PLUS U3 Series projectors are the world's first palm-sized digital projectors, measuring just 7"x9"x1.9", and weighing only 2.9 lbs. The U3-1080 (XGA resolution) and the U3-880 (SVGA resolution) use Texas Instruments' Digital Light Processing technology to deliver 800 ANSI lumens of brightness and an 800:1 contrast ratio. And both projectors are designed to take some punishment with magnesium alloy cases that are 20 times stronger than plastic.

their connections. The modem slips into a laptop without the need for external batteries, and its antenna locks into five different positions for easy storage.

Paul also recommends adding a separate voice telephone line for the home-office, "unless you are already living on your cell phone," and he suggests looking into online services that consolidate phone, fax, and voicemail, and let you manage your accounts on the Web. "Services like

#### Home-Office Profile

WHO: Darryl Robinson, founder of Robotica Automation Consultants Inc., a Boston-based software development company that specializes in Microsoft Windows software, Internet/Intranet applications, and the creation of interactive Web sites.

#### BUSINESS CAPSULE:

Robinson goes on site two days a week to visit clients including leading software companies, hospitals, and retailers in the Boston Metro area.

### WHAT HE DOES AT HOME:

Robinson docks his notebook PC and Cassio Cassiopeia PDA to a

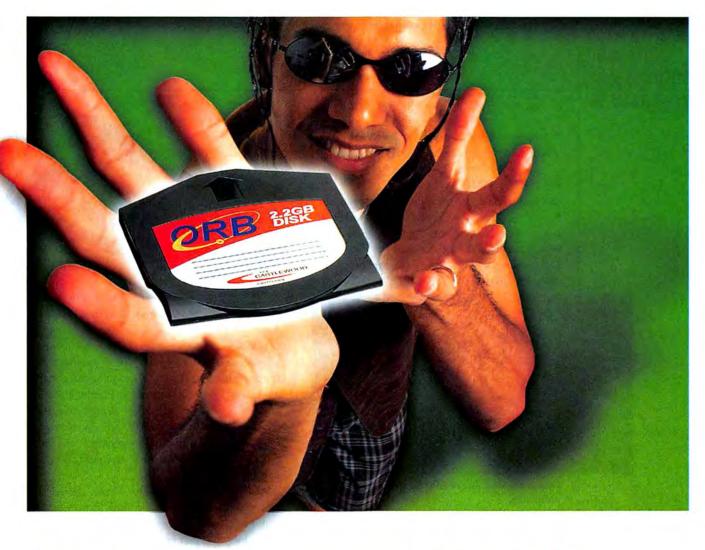
Windows NT workstation at his home-office in Boston. "I rely on both [the notebook and PDA] for contact management and to record voice memos," he says. Robinson also uses his notebook to run development software and Microsoft Outlook. "The laptop serves as an office away from home," he says. "It's actually a replica of one of my desktop workstations."

WHAT HE USES: Robinson shares his home with a complete Windows NT network, consisting of three NT servers "and a handful of workstations," he says. One of the servers hosts Web sites for Robotica

and the company's small and midsize business clients, another handles email, and the third is a domain controller for internal resources. Robinson uses DSL for his business, "which is the way to go if you want to take advantage of high-bandwidth applications like Microsoft NetMeeting," he says.

#### ADVICE FOR HOME-OFFICE

HOPEFULS: "Make sure your home-office PC is powerful and mirrors your at-work system as much as possible," Robinson says, "because if it doesn't, that's the first excuse your boss will use to drag you back into the office."



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COMPUTING TO GO!

ThinkLink.com, for example, can help to streamline that part of your business," he says.

#### MAKING HOME SWEETER

Of course, one of the most desirable aspects of the home-office is the freedom it gives workers to control their environments. An Oriental rug is Paul's most important piece of home-office furniture. "It turns the room into a pleasant place to be while I do my work," he says. "And that makes a



One of the new line of APC SurgeArrest surge protectors.

big difference in how much time I'm willing to spend there."

Even peripheral makers are coming up with alternatives to bland, one-color-suits-all designs. American Power Conversion Corp. recently expanded its SurgeArrest family of surge protectors to include compactly designed devices with translu-



cent kick-guard plates in seven colors patterned after Apple's iMac computer. The new surge protectors feature eight outlets, including three that are spaced to accommodate transformer blocks, and two "always-on" outlets for devices requiring constant power. The new design incorporates a right-angle plug to maximize workspace, and the unit can be mounted on a wall or stored on or under a desk.

At his home-office in Austin, Thierry chooses to fill his workspace with music from his massive CD and record collection, which he has been converting to MP3 files that he can take on the road. But what impact has all of this work—and play—had on his golf game? "I don't get out there nearly enough, and my handicap is starting to creep up again" Thierry says. "So if I shoot in the 70s, I guess I'm pretty happy."

Continued on pg. 112

## The Mobile Users' Home-Office Hotlist

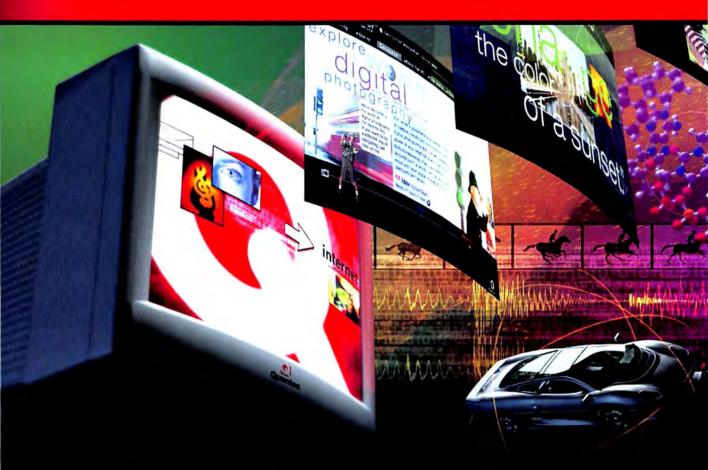
Tap these Web sites for your business—at home or anywhere.

- AllBusiness.com—This online resource strives "to be at the very heart of the small business marketplace." The site delivers expert advice on Internet and technology issues, as well as services for human resources, sales and marketing.
- BuyerZone.com—Small and midsize business decision-makers can take advantage of the keen purchasing advice and tools offered on this site.
- Desktop.com—This Web portal provides calendars, one-stop integrated e-mail, a growing list of custom applications, and a unique browser interface.
- Gómez.com—Gómez.com evaluates online businesses and provides decision support to buyers of books, bank accounts, toys, travel agents, and prod-

- ucts in two dozen other categories.
- PCWorld.com/consumer— PC World's Consumer Advice section helps steer shoppers clear of online ripoffs, and points them toward the Net's best deals.
- Point.com—Cellular phone savings are just a few clicks away on Point.com. The site's Service Plan Locator offers detailed comparisons of service plans in any area.
- Yahoo.com The granddaddy of Web portals offers e-mail, calendars, and instant messaging that can be accessed from any browser. And TrueSync for Yahoo! lets PalmOS and Windows CE users synchronize their devices to Yahoo! Calendar, Address Book, and To Do List.



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One-Year Limited On-Site Service

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Peripheral Upgrades: Canon MultiPass C560 Printet/Scanner/Fax/Copiet, add \$299, 48-bit USB Color Scanner, add \$99, MS Sidewinder Precision Pro Joystick add \$49 Lexmark Z52 Color Printer add \$179

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E-QUOTE NUMBER: pcw07m04



Quantex SM933r Performance Desktop Pictured

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Intel 10/100 PCI Fast Ethernet Controller w/W Advanced Creative Labs Sound Microsoft Windows 2000 Professional Microsoft Office 2000 SBE 3-Year Limited Warranty One-Year Limited On-Site Service

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Quantex W-Series Notebook Pictured w/Optional Mini-Docking Station

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128MB ECC SDRAM (2GB Max)
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Ultra2/LVD SCSI Controller
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and Adaptive Load Balancing
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# Personal Digital Video Recorders Upstage VCRs

#### HARD DISK RECORDERS

TAKE TOTAL control of your TV with personal digital TV recorders, now equipped with improved show-selection features and more memory than earlier incarnations possessed. These so-called hard disk re-

couch potato's dream: You can pause a live show when the phone rings, freeze frames, or push a button to initiate instant replay. Other features: multispeed fast-forward and backup, and on-screen prokeep programs long-term, and not just manage viewing times for your convenience, you'll want to transfer them to videocassette tape to free HDR memory. This is easy to do, so don't chuck the VCR yet.

Both HDRs I looked at can receive automatic program guide updates from their respective services via modema key feature. (You don't have to subscribe to the services, but without them you pay an awful lot just for the ultrafastforward and instant replay.) If you use the programming services, the difference in cost between the two HDRs is considerably less than the gap in

maze of cords and cables (including a phone line hookup) to download the program guide. The Panasonic hard drive is slightly noisy when downloading the guide. Both devices do their spinning and hoodoo late at night, when you're least likely to need the phone, and they never interrupt phone calls; if you happen to be using the line, they simply try again later.

I liked the ReplayZones onscreen feature, where I could seek out and easily record programs categorized by specific genre-movie, sitcom, talk show, and so on. Replay also permits creation of viewerselected theme channels-say, an all-Simpsons or all-Julia Roberts program collection. I also liked Replay's advanced program-search functions, which let you track programs by topic, title, actor, or director. TiVo says the next version of its software will match these capabilities. Currently, TiVo



Panasonic (lower right) hard disk recorders make for smart TV.

corders—basically hard drives in VCR-size boxes-let you specify what you want to see, when you want to see it, and with what special effects. Using an HDR to fine-tune your entertainment options is amusingly addictive-and the device's powers are light-years beyond any VCR's capabilities.

I looked at shipping units of two models: the \$399 Philips Personal TV Receiver HDR312 and the \$700 Panasonic Show-Stopper Hard Disk Recorder PV-HS2000. Both of these HDRs can convert TV input received from antenna, cable, or satellite into digital data quickly savable to a hard disk. It's a

gram guides that let you use your remote control to browse by channel, time, show name, or topic, as well as call up easyto-read show descriptions.

Both HDRs carry 30GB Quantum hard drives that hold 30 hours of MPEG-2 video and stereo sound at basic recording qualitygood enough for most TV shows. (Some previous units had smaller disks, others were far more expensive.) Unfortunately, at highest recording quality, which you'll want for broadcasts with lots of movement, the devices' capacity quickly shrinks. If you need to

their list prices suggests. TiVo Service for the Philips is \$10 a month, \$100 a year, or \$199 for the box's lifetime, while ReplayTV Service is included free with the Panasonic.

Installation is simple, but you have to wade through a generates personalized programming recommendations based on how you rate shows (you classify them by employing thumbs-up, thumbs-down

PHOTOGRAPHS: MARC SIMON

#### CONTEN

#### Panasonic ShowStopper Hard Disk Recorder PV-HS2000

PRO: More options to customize TV viewing; free Replay service. CON: Complicated to master. VALUE: For technically savvy types.

List price: \$700, Replay service free

Panasonic

www.panasonic.com/video

ReplayTV

877/737-52988

www.replaytv.com

buttons on the remote). This feature didn't produce interesting recommendations in my tests, but it's supposed to work better over time.

#### Phillips Personal TV Receiver HDR312

85 Norton Net Security

PRO: Very simple to operate. CON: Few programming options.

VALUE: Buy it if technophobes or kids are involved.

List price: \$399; TiVo service \$10/ month, \$100/year, \$199 lifetime

Philips USA

www.philipsusa.com

TiVo

877/367-8486

www.tivo.com

Both Replay and TiVo expect to add programming you can't get on regular TV. For example, TiVo plans to offer IFilm's broadband film and animation content, which was previously available only on the Web.

Overall, the Philips Personal TV Receiver is the easier box to operate. Recording is a snap, and the remote is simple and pleasing (though the picture briefly freezes when channels change). Buy this one if you don't like grappling with technology or if kids are involved. The Panasonic was a two-fisted job-complicated remote in one hand and complex directions in the other. But the search options on its Replay software make personal programming with it more fun.

-Anne B. McDonald

#### 78 Panasonic ShowStopper Hard Disk Recorder PV-HS2000, Philips Personal TV Receiver HDR312

- 79 Dell Dimension XPS B1000r Special Edition
- 80 Fujitsu LifeBook B-2131, Toshiba Portégé 3440CT; Samsung SyncMaster 150MP LCD
- 82 Epson Stylus Color 670 printer; ELSA Gladiac video card
- 84 Canon PowerShot S20, Epson PhotoPC 3000Z, Kodak DC290 Zoom, Olympus C-3030 Zoom
- 85 Norton Internet Security 2000; Opera 4 browser
- 86 PowerQuest PartitionMagic, Drive Image; PowerDesk 4 Pro
- 88 EPeachtree; FreeHand 9
- 90 FinanCenter.com, LowerMy-Bills.com: Timeslips 10
- 92 Spotlight on online photo services



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booms out crisp, loud audio through the Sound Blaster Live sound card. Playing Unreal Tournament on this machine should be like stepping into your own private arcade.

For the business end of things, Dell offers an Aztech V.90 modem and an ethernet card plus Microsoft Office 2000 Small Business Edition. The company's superb record for customer service and reliability backs the whole package.

A price near \$4000 makes this system unsuitable for some budgets. And the PC's \$3179 PIII-866 sibling should exceed most people's needs. But if cost is no object in your pursuit of top performance, Dell's 1-GHz PIII delivers.

-Joel Strauch

# Dell's Pricey, Packed PIII-1000

DESKTOP IN THIS AGE of budget computers, you can still splurge on a PC. Dell's latest Dimension, the XPS B1000r Special Edition, has a 1-GHz Pentium III processor-and a \$3769 price.

A shipping model of the Dell running Windows 2000 with 128MB of RDRAM (so memory upgrades won't come cheap) earned a PC World-Bench 2000 score of 178—the

#### **Dell Dimension XPS B1000r Special Edition**

PRO: Fastest Windows 2000 system we've tested.

CON: Expensive.

VALUE: Best performance money can buy for high-end users.

Street price: \$3769

**Dell Computer** 

800/388-8542

www.dell.com

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

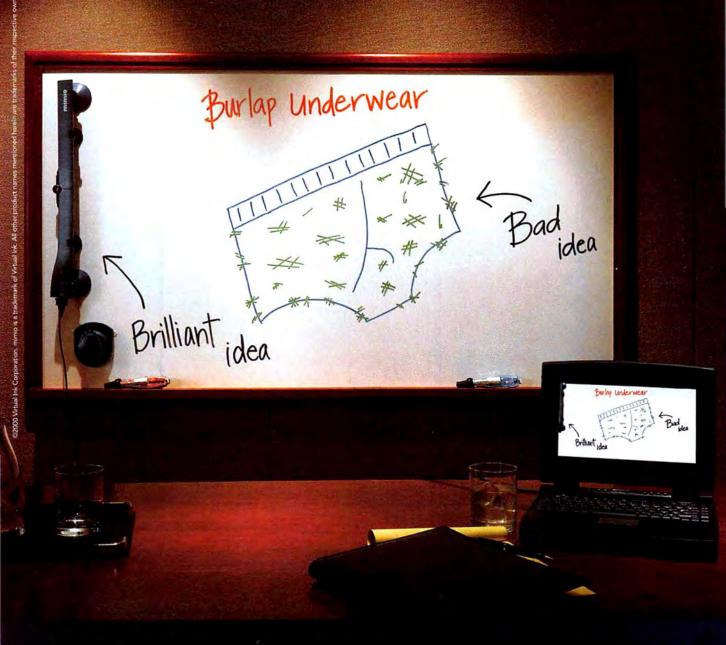


NEW WINDOWS 2000 CHAMP: Dell's Dimension XPS B1000r Special Edition with a 1-GHz PC is the fastest Windows 2000 PC we've tested.

best we've seen for a PIII-1000 Windows 2000 box (Windows NT 4 desktops hold the top scores). It's less than 5 percent faster than a similarly configured \$3199 PIII-866 Dell-no appreciable difference in business applications. But the extra \$570 should buy a significant performance boost for games and high-end graphics.

Your investment buys more

than the fastest processor on the market. Dell includes a 8X/4X/32X CD-RW drive, a 40GB hard drive, and excellent multimedia. Assisted by an NVidia GeForce 256 graphics card with 64MB of speedy DDR memory, the Dell Ultra-Scan Pooi 19-inch monitor delivers vibrant colors and sharp text. The Harman/Kardon HK595 three-speaker set



# With mimio, any whiteboard becomes an electronic whiteboard. Every idea should be this good.

Ever wish you could quickly share the results of your latest brainstorming session with co-workers or clients? Now you can with mimio. Simply attach it to any whiteboard up to  $4 \times 8$  feet and connect it to a PC. Then insert a standard Expo marker into a mimio stylus and start

writing. The mimio software captures
whatever you write or draw in color and in

real time. Print, fax, e-mail, drag and drop into any Windows\* application, or share notes across the Internet. At less than 2.5 lbs., mimio is portable and durable. Perfect for travel. And it's priced at just \$499 including everything you need to turn any whiteboard into an electronic one. For a demonstration, visit us at www.mimio.com or call 1.877.my.mimio.



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#1 rated Internet backbone, Boardwatch magazine 1999

Network Computing

#1 rated Managed Security, Network Computing magazine 1998

TeleChoice

#1 rated overall ISP TeleChoice survey 1999, and #1 in customer service 1998

- Same

Pinnacle Award winner for service and innovation, X-Change and Phone+ magazines

clathunications

Top 25 ISP, Data Communications magazine 1999 and 1998

"Dynamic100" Top Technology Company rankings, Forbes ASAP magazine 1999 and 1998

Top 100 Growth Company and "Hot Growth Company," Network World magazine 1999

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ion battery. Though it ships with a 16MB Type I Compact-Flash memory card, it accommodates Type II cards (such as IBM's 340MB Microdrive) that are capable of storing hundreds of shots.

You can operate the Canon with one hand, but the camera's complex menu structure and its use of icons to identify buttons may frustrate some users. Image quality is generally excellent, though we experienced occasional, inexplicable duds. The Canon is great

#### Canon PowerShot S20

PRO: Compact; easy one-handed shooting; great stills; many features. CON: Complex control labels, low 2X optical zoom, no video or audio. VALUE: Great carry-along for onthe-go users who want a light, compact, stylish camera that fits in a

pocket or purse. List price: \$799

Canon USA

800/652-2666 www.cusa.canon.com

Epson PhotoPC 3000Z

PRO: Great pictures, supereasy to operate, hot shoe for extra flash.

CON: Slow to recycle in enhanced mode, flash seems too brilliant in macro mode.

VALUE: The camera to beat for photo enthusiasts.

List price: \$999

**Epson America** 

800/463-7766

www.epson.com

#### Kodak DC290 Zoom Digital Camera

PRO: Traditional camera look and feel; custom scripting capability.

CON: Not a true 3-megapixel unit, limited manual controls, exposures sometimes come out looking dark,

no video or panorama capability.

VALUE: Good for novices.

List price: \$795

Eastman Kodak

800/235-6325

www.kodak.com

Olympus C-3030 Zoom

PRO: Good handling, great versatil-

ity, top image quality.

CON: Can be difficult to operate.

VALUE: For advanced amateurs who want to use all the extras.

List price: \$999

Olympus America

800/622-6372

www.olympus.com/digital

# Norton Protects Broadband Hookups

SECURITY

HIGH-SPEED Internet access is wonderful, but an always-on broadband connection leaves your PC vulnerable to bored hackers who may rifle through your data-or worse. Symantec addresses that risk with Norton Internet Security 2000. This \$55 package for the Windows 9x family combines a coffusion firment Commenter's robust and easy-to-use Norton AntiVirus 2000 program, and other useful features.

After installing a shipping copy of the hefty 6oMB program on a 266-MHz Pentium II system with a DSL connection, I visited the Gibson Research site (grc.com), which maintains utilities that safely probe a PC for security prob-

Most people will buy this product for its firewall, but the extras are worthwhile, too. One great feature blocks annoying banner ads at Web sites. Privacy advocates will appreciate the advanced cookie-blocking tool and the ability to protect specific information (such as credit-card data). Finally, parents can create separate Webaccess privileges for each kid.

If you want nothing more than a personal firewall, check out ZoneAlarm, an effective and free offering from Zone Labs (www.zonelabs.com). But factor in the extras (including the \$35 antivirus package) and Symantec's price is reasonable if the payoff is a little security in this crazy Internet world.

-Tom Mainelli

Morton Internet Security

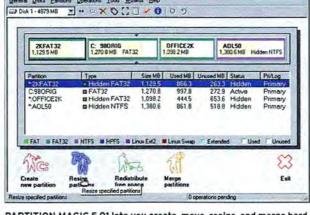
BE X

# Minimize the Hazards of Trying Windows 2000

WANT TO TRY out Windows 2000, but afraid that it may render your computer unusable? PowerQuest utilities PartitionMagic and Drive Image help you experiment safely.

PartitionMagic 5.01 lets you create, move, resize, hide, and unhide partitions in relative safety. Once you've created an extra partition for Windows 2000 (or any other OS), you can move from one OS to the other without any risk.

What if you damage a partition-say, by installing a program that corrupts Windows 2000 and won't uninstall? With Drive Image 3, you can save a copy of a partition or drive as a compressed file. If you damage Windows later, you can restore the backed-up partition in minutes-from a DOS-based boot floppy, if necessary. You should use Drive Image with PartitionMagic,



PARTITION MAGIC 5.01 lets you create, move, resize, and merge hard disk partitions with a few simple mouse clicks.

unless you're copying to an external drive or DOS network.

Unlike their predecessors, both programs can handle today's huge hard drives. Both packages also support Windows 2000 (previous versions did not handle partitions in the new OS properly), but they don't actually run in the new OS. Drive Image is a DOS program, and launching it from Windows 9x drops your PC into single-tasking DOS Compatibility mode. PartitionMagic is a Windows program, but

to do much of its work it must exit Windows and enter DOS mode. Since Windows 2000 doesn't have a DOS Compatibility mode, you must launch PartitionMagic or Drive Image from your Windows 9x partition or from a boot floppy.

Drive Image 3 introduces a spiffed-up user interface and such new features as the ability to restore partitions quickly by skipping error checking, which is especially useful if you want to test something.

Don't confuse the new Drive Image 3 with the more expensive Pro edition released last year that contains features for IT types. Get PartitionMagic to make all your operating systems readily available, and add Drive Image to gain the ability to restore that fresh install. With these two programs on your side, Windows 2000 no longer looks so scary.

-Lincoln Spector

#### PartitionMagic 5.01

PRO: Safely creates, resizes, moves, and deletes partitions, including those running Windows 2000.

CON: Requires boot floppy in Windows 2000.

VALUE: Terrific if you're juggling operating systems.

List price: \$70

#### Drive Image 3

PRO: Quickly backs up and restores drives or partitions, bypassing need to reinstall OS.

CON: DOS program can't be launched from Windows 2000.

VALUE: Restores uncorrupted Win-

dows in minutes.

List price: \$70

**PowerQuest** 

800/379-2566

www.powerquest.com

# PowerDesk 4 Pro Outdoes Windows Explorer

PowerDesk 4 Pro cures the anemic Explorer in Windows 9x, 2000, or NT 4.0. Besides handling basic file management tasks (moving, copying, and deleting files), this \$20 utility can view files saved in any of 200 formats and can use FTP files to transfer files to and from a Web server.

The program's File Manager lets you set filters, sort file lists, drag and drop files in a two-pane view, print files and tree lists, delete and destroy files, and open or create Zip files. Version 4 adds 10 graphics conversion formats to the 20 its predecessor could handle. You can also encrypt files, copy a file name or its path to the Windows Clipboard (to help colleagues find them on a network) and quickly set file and program associations.

PowerDesk 4 Pro includes four additional utilities. Size Manager displays file and folder sizes-useful when you have to free up storage space. A floating, dockable Coolbar monitors CPU and system resources, displays multiple clocks, and holds shortcuts to applications and system functions. The File Finder utility does little that Windows' Find Files can't, but Dialog Helper works with standard File Open and File Save dialog boxes to provide lists of recently used files and folders for applications that don't do this.

Overall, PowerDesk 4 Pro is still one of the best file management tools on the market.

—Joel T. Patz 🕨

#### PowerDesk 4 Pro

PRO: Great, fully integrated file management tools give users more control than Windows Explorer.

CON: File Finder is nothing special.

VALUE: Affordable package greatly simplifies routine tasks.

List price: \$20

**Ontrack Data International** 

800/872-2599

www.ontrack.com







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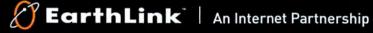




\*Requires three-month commitment at \$19.95 per month (restrictions may apply).

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## A Peachtree Grows on the Web

#### ACCOUNTING

A NEW BREED of accounting software is proliferating: Webbased programs that enable you to access your data from any Internet-connected computer equipped with a recent Web browser, Peachtree Software, a venerable name in PCbased accounting, enters the fray with EPeachtree.com, a

Web-based service that costs \$10 per month for a single user and \$5 a month for each additional user.

The number of users determines whether the Web version is cheaper or more expensive than Peachtree's \$249 (for up to five users) desktop product (assuming that you upgrade every year or so). But

the Web-based product will eventually offer more features than the desktop version. As with other Web-based apps, upgrades are part of EPeachtree's service, and you won't need an IT staff to handle installation and maintenance.

EPeachtree requires you to use Internet Explorer 4 or 5 on a Windows 9x or NT system. Though the program runs primarily on Peachtree's servers, you must download Crystal Reports (a nearly-500K reportwriting module) to run on your computer. Peachtree says it will support other platforms by year's end, and by this summer will have a payroll service running (priced at an additional \$10 per month).

I tested EPeachtree over DSL and 56-kbps connections, and found that either way it ran a bit slower than the desktop program. Setting up a new company involves following an easy-to-use checklist similar to those used in Peachtree's desktop products, and online help is clear. You can generate inventory management forms, invoices, checks, and reports in a snap. And EPeachtree includes budgeting and flexible reporting.

The downside? Although Peachtree is capable of converting a Peachtree Office Accounting file for use online by new subscribers, the Web version can't import data from other programs, so data entry may take a lot of time. And you can export data only to Excel or Word. Otherwise, if you want to keep your books on hand wherever you go, EPeachtree is well worth a look.

—Theresa W. Carey 🕨

## FreeHand Enhancements: Few but Useful

#### GRAPHICS

FreeHand 9-the latest upgrade to Macromedia's illustration tool-packs sufficient depth to please its core constituency of pro designers.

This \$399 package's coolest new tool, the Perspective Grid, lets you visualize layouts along 3D planes instead of in two dimensions. Competitor Corel-Draw can fix vanishing points to objects, but FreeHand has a more coherent environment for composing layouts. Attach an object to a plane, and its size and angle change depending on how far it lies from the screen. Too bad you can't do this with scanned photos.

Unlike both Corel Draw and Adobe Illustrator, FreeHand o

#### FreeHand 9

PRO: Stunning 3D layouts, built-in Flash preview, more distortion tools. CON: Perspective warp ignores photos; symbols can't be shared. VALUE: Impressive vector-based design for print and Web pros.

Macromedia 800/457-1774 www.macromedia.com



DEPTH PERCEPTION: New vanishing-point grids help FreeHand 9 users compose cool vector-based print and Web layouts in 3D.

lets you export drawings to its Macromedia sibling Flash 4 (you can buy the two as a set for \$499), which can transform them into Web interfaces and animations. Another advance is FreeHand o's new Flash Anti-alias mode, which lets you work on graphics as they will appear online.

Like various other Macromedia products. FreeHand uses symbol libraries, so master graphics are stored, reused, and updated globally without causing bloated files. But you can't share these libraries between Macromedia products.

You can deform objects with 21 presets-such as Arc and Octagon-or warp shapes by adjusting Bezier curves. Free-Hand 9 adds two new selection tools-Magic Wand and Lasso-and refines controls for color output, shape blending, and drawing precision.

FreeHand 9's innovations may not be dramatic, but they should inspire cooler print and Web designs-especially for users of Macromedia's popular Web tools.

-John Goddard

#### EPeachtree.com

PRO: Easy to set up; powerful accounting features for mobile users. CON: Can import only Peachtree Office Accounting data.

VALUE: Web-based accounting can

save money and hassles. Street price: \$10/month for one user,

\$5/month for each additional user.

**EPeachtree** 

800/228-0068

www.peachtree.com



The new Astra 3400 scanner from UMAX. Beautiful scans at your fingertips.



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Visit www.umax.com or call 1.800.331.8629 for further information.

Where technology is headed.

# Free Web Tools to Help You Save Money

#### PERSONAL FINANCE

THE GLUT OF financial information on the Web would fill at least 100 phone books, but not everything you read is good for your bottom line. FinanCenter.com and LowerMy-Bills.com offer services to help you boost your financial standing without sacrificing too much time or energy.

Both sites make money by working as go-betweens for service providers, not simply by selling ads. FinanCenter provides a suite of personalfinance shopping tools, while LowerMyBills partners with numerous banks, wireless carriers, and insurance companies to showcase their services. If you find a cheaper deal than your current one, LowerMyBills will either pass your request along to its partners or give you a contact phone number or Web address for nonpartners. Anyone who uses Netscape Communicator 4 or Internet Explorer 4 or

above can browse the site's offerings free of charge.

FinanCenter.com examines finance products in seven categories: Autos, Banking, Credit Cards, Homes, Investing, Planning, and Insurance. Each offers easyto-use calculators (more than 120 in obtain real-world

answers to simple or complex financial issues. The results of your calculations are meticulously explained, too, so you're never left wondering what something means. Useful tips abound: I liked the calculator



A SEARCH BY LowerMyBills.com for lower all) that help you long-distance prices netted 39 plan offerings.

that showed the difference in profit for holding a stock short term versus long term.

LowerMyBills.com focuses on reducing totals of up to 18 monthly bills, including cellular phone, gas and electric,

insurance, and long distance. The most useful part of the site is a feature that compares your current service costs with prices offered by competitors.

My Long Island, New York, city wasn't among those covered, but the company says it is rapidly expanding its geographic database. When I searched for long distance, the site failed to mention my current plan at all, though it costs 2 cents per minute less than the cheapest plan listed. Still, the ability to consider so many options quickly makes the site a worthwhile destination.

Other finance sites, such as LendingTree.com and Bankrate.com, focus more on sales than education. Your best bet? Use a combination of these sites to keep your pocketbook in tip-top condition.

-Karen J. Bannan

# Timeslips 10 Turns Hours Into Dollars

CONSULTANTS, lawyers, accountants, and other professionals who bill by the hour need a program like Timeslips 10 to handle their bookkeeping requirements. The latest version of Sage U.S. Holdings' popular time and billing program includes support for accrual accounting for workin-process-an improvement that simplifies measuring the profitability of longer projects. I looked at a shipping copy.

ACCOUNTING

Many of the more than 20 enhancements will appeal to accounting firms. You can now transfer work-in-process amounts to 20 supported accounting programs, including QuickBooks and Peachtree. (Since Timeslips doesn't do general accounting, however, you'll need to do this to fully automate bill payment, preparation of financial statements. and so on.) The upgrade can calculate discounts for prompt payment of invoices. If you work on multiple projects for one client, you can easily allocate payments and deposits to the right project.

The most basic version of Timeslips, Level 1 (\$180), limits you to two timekeepers and lacks text search-a tool that lawyers commonly use. Level 2 (\$400) adds new progress and interim billing capabilities and supports up to eight timekeepers. Level 3 (\$1000) permits 100 timekeepers and

adds additional features likely to interest larger companies. Prices for the cheaper editions are due to drop in late July.

Version 10 of Timeslips is clearly a worthwhile upgrade for accounting firms and other service-oriented businesses that work simultaneously on several client projects.

—Richard Morochove >

#### Timeslips 10

PRO: Scalable program delivers flexible time tracking and invoicing. CON: Nothing significant.

VALUE: Great value for professional practices and service businesses. List price: \$180-\$1000

Sage U.S. Holdings

800/285-0999 www.timeslips.com

LowerMyBills.com

track down a good deal.

FinanCenter.com

CON: Nothing of note.

520/615-6600

www.financenter.com

LowerMyBills.com

deals on common services.

PRO: Excellent calculators help you get a grip on your bottom line.

VALUE: Good way to get a clear pic-

PRO: Easy tool for finding the best

CON: Your town may not be on the

site's list; not all plans are covered.

VALUE: May or may not help you

ture of your financial health. FinanCenter.com

818/755-8800

www.lowermybills.com

# Introducing the Bigger Picture



ViewSonic® PerfectFlat® CRT technology steps up to the big screen with the introduction of the PF815 22" (20" viewable) monitor.

PerfectFlat CRT technology provides rich, vibrant colors with an absolutely flat screen for incredibly sharp edge to edge images. The result is a picture that is precise and true to life. Whether used for the demanding requirements of CAD, Imaging, Graphic Design or general computing, the PF815 is a true visual workhorse offering the ultimate in color saturation and clarity.

Previously only available on select ViewSonic 17" (16" viewable) and 19" (18" viewable) CRT monitors, the PF815 is the first ViewSonic big screen to incorporate PerfectFlat technology. The PF815 also features a super-fine 0.25-0.27 variable aperture grille pitch, a recommended resolution of 1600 x 1200 at a flicker-free 92Hz., dual inputs with BNC connectors and OnView\* controls including corner purity adjustment and ViewMatch\* for matching the image to print output.

At ViewSonic, we offer the #1 best selling monitors and flat panel displays in the USA\*. Buy with confidence from the company that has won over 600 industry awards. For more information, visit our website at: www.ViewSonic.com/pf815









The Visual Technology Company™



# Painless Prints: Photo **Sharing Made Easy**



Ofoto's offline viewer/uploader makes cropping pictures easy; its cropping frame stays proportional to the size of the final print.

#### PHOTO SITES

WE LOVE taking pictures: vacations, parties, pets, friends, family. Each year, Americans take billions of amateur photos. But while snapping pics is easy, developing and sharing them can be a chore-unless you do it all on the Web.

Developing and sharing your photos online is simple. Upload your images to a site like Ofoto, organize them into albums, and invite your Webconnected pals to see them and order reprints. If you use a 35mm film camera, send your film to the site, get your images uploaded, and then have them printed and mailed to you with your negatives. To send reprints to someone who is unconnected to the Web. order reprints online and the site will ship them directly to the address you specify.

#### CLICK, POST, PRINT

ONLINE PHOTO services can range from minimalist sites that do nothing but digital

printing to photo communities that shun printing in favor of online photo sharing. I checked a half dozen of the newest and most interesting sites: Club Photo, EZ Prints, Ofoto, PhotoLoft.com, Shutterfly, and Snapfish.com.

Most sites try to draw you in with gimmicks such as photo mugs, T-shirts, and online photo auctions. My favorite site, Ofoto, offers some extras, but it also includes a terrific offline viewer, produces the best prints, and provides unlimited photo storage space.

Getting started on these





THE SHARPEST SHOT: Ofoto's reprint (left) came closest to the original, while Snapfish.com's (right) seemed fuzzy and washed out.

sites is a snap. Most launch you with a free, quick sign-up form. Then you must provide an account name, an e-mail address, and a password. As soon as you're signed up, you get access to a page for posting and viewing your images.

Uploading pictures from your PC can take a long time if you have to guess which cryptically numbered file on your PC contains the image you want. The upload (typically in .jpg format, though some sites allow other formats) can take 4 to 6 minutes with a 56kbps modem, so you don't want to discover too late that you sent the wrong photo.

An easier method involves working with a file viewer, which every site offers as a free download. With a file size of over 1MB, this app can take 5 to 10 minutes to download across a 56-kpbs modem, but it repays the effort. File viewers convert ugly, unintelligible file names into thumbnail images you can view offline. To upload the ones you want to share, pick images from the thumbnails, connect to the Internet, and click a button.

Once an image is digitized, you may want to spruce it up. Nearly every viewer I looked at included simple editing tools such as crop, rotate, and flip.



**ONLINE PHOTO sites let you** avoid annoving trips to the 1-hour photo lab. With these services, you can:

- Send standard 35mm film for developing and digitizing.
- · Post images so others can view them on the Internet.
- Order reprints easily.
- · Send copies of pictures to any address you specify.
- Create online photo albums.

PhotoLoft.com's minimally useful viewer lets you stretch a rubber-band box into any shape, but the box doesn't correlate with the shape of the final print. EZ Print's more complete viewer allows you to select a print size and then provides a proportional frame that you can move around the image to define what stays and what goes when you crop. But this tool, unlike the others. doesn't let vou work offline. Ofoto's viewer is the best: Pick a print size, and a cropping frame pops up over the image. You can enlarge it, shrink it, or shift its position, and the frame will maintain the correct proportions.

All of these Web sites are simple and easy to use, but some work better than others. Ofoto, my top pick, presents you with a clean, straightforward interface. EZ Printswhich revamped its site while I was writing this article-

# SOME DAY, THERE WILL BE SUPPORT GROUPS FOR THOSE HOPELESSLY HOOKED ON SPEED, SEX AND POWER.



# UNTIL THEN, THERE'S THIS.

#### MILLENNIA MAX 866

\$1899

\$**68/**MO.

- Intel Pentium III processor 866MHz
- 128MB 133MHz SDRAM
- 30GB<sup>()</sup> ATA-66 (7200 rpm) hard drive
- 17" Micron™ 700Dx (15.9" display) monitor
- 12X DVD-ROM drive
- 32MB nVidia TNT2 Pro AGP graphics
- 128-voice Wavetable sound
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- 5-year/3-year Micron Power limited warranty
- Microsoft\* Windows\* 98
- Microsoft Office 2000 Small Business



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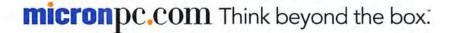
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64MB 133MHz SDRAM	128MB 133MHz SDRAM	128MB 133MHz SDRAM	
10GB° ATA-66 (7200 rpm) hard drive	10GB <sup>o</sup> ATA-66 (7200 rpm) hard drive	30GB <sup>0</sup> ATA-66 (7200 rpm) hard drive	
17" Micron 700Dx (15.9" display) monitor	17" Micron 700Dx (15.9" display) monitor	19" Micron 900Lx (18" display) monitor	
40X var.° speed CD-ROM drive	40X var.° speed CD-ROM drive	12X DVD-ROM drive	
16MB nVidia Riva TNT2 AGP graphics	32MB nVidia TNT2 Pro AGP graphics	32MB nVidia GeForce 256 AGP graphics	
128-voice Wavetable sound	128-voice Wavetable sound	128-voice Wavetable sound	
2-piece standard speakers	2-piece standard speakers	2-piece standard speakers	
56K V.90 modem	56K V.90 modem	56K V.90 modem	
5-year/3-year Micron Power limited warranty	5-year/3-year Micron Power limited warranty	5-year/3-year Micron Power limited warranty	
Microsoft Windows 98 Microsoft Office 2000 Small Business	Microsoft Windows 98 Microsoft Office 2000 Small Business	Microsoft Windows 98 Microsoft Office 2000 Small Business	

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offers a clear, basic layout. PhotoLoft is filled with features but remains usable.

#### REPRINTS ON THE RUN

WHEN YOU'VE tweaked your images to look the way you want them to, you're ready to order reprints. First, view your images in thumbnails; then choose the ones you want printed. Select the quantity and size of each reprint. Finally, choose where you want the prints sent. Club Photo is the only site that made ordering reprints clumsy: There, you go to the print size page first and then select the images.

What do online reprints

for an 8-by-10, with turnaround in one to three days.

I ordered reprints in various sizes from EZ Prints, Ofoto, PhotoLoft.com, and Snapfish. com and compared them to pictures I arranged to have developed at a traditional lab and printed on Kodak paper. Every site promises reprints in a week to ten days for a shipping charge of \$1.50 to \$2. If you want reprints sooner, you can pay \$10 to \$15 per order and get your pics in one or two days. All of the digital reprints lost some sharpness, but none looked horrible. Ofoto's came closest in detail and color quality to the originals. The images

Photo sites are the best way to share pictures, and they're a great supplement to standard printing.

cost? The six sites I examined charge an average of 50 cents for a 4-by-6-inch print and \$4 for an 8-by-10. But fees vary—PhotoLoft.com charges \$8 for an 8-by-10 reprint. By comparison, a typical lab charges about 45 cents for a 4-by-6, \$2.65 for a 5-by-7, and \$5.25

from EZ Prints, PhotoLoft. com, and Snapfish.com had a fuzzier, washed-out look.

#### COME ONE, COME ALL

WANT YOUR brother in Florida to see pictures of your new backyard in Alaska? Create an online photo album. Nearly



PHOTOLOFT.COM'S SLIGHTLY BUSY home page displays its varied selection of services—but the site won't develop your film.

every site lets you share photos over the Web, whether the site makes prints or not. (The exception, EZ Prints, doesn't offer photo sharing and limits storage to 30 days.)

Most sharing tools work like this: Pick the shots you want your brother to see, arrange them in an album, enter your brother's e-mail address, and click *Share*. Your brother then receives an e-mail inviting him to the site. Once there, he enters a password included in the e-mail—and presto, he's looking at your album.

If you would rather make

your album available to all comers, sign on with a community site. Both Club Photo and PhotoLoft.com cater to the photo exhibitionist by offering unlimited image sharing, if you choose to allow it.

Can photo sites take the place of a trip to the lab? Almost. Photo Web sites are the best way to share photos. For now, though, they merely supplement standard printing. As our thirst for documenting everything continues, photo sites will help remind us of where we've been.

-Tracey Capen |

#### Top Pick for Pics: Ofoto Makes Cropping and Printing Easiest

SITE	Online Cost per reprint (5/12/00)		Features	The skinny
Club Photo www.clubphoto.com	Unlimited '	4 x 6, 45¢; 5 x 7, \$1.49; 8 x 10, \$4.49	Albums, sharing, e-cards, gifts, galleries, film processing.	Photo portal/community. Clumsy interface for ordering reprints.
EZ Prints www.ezprints.com	30 days	4 x 6, 49c; 5 x 7, 95c; 8 x 10, \$2.95	Processing, reprints, gifts, albums, limited online storage.	Takes the minimalist approach to online printing. Basic, functional, and easy to use.
Ofoto www.ofoto.com	Unlimited	4 x 6, 49¢; 5 x 7, 99¢; 8 x 10, \$2.99	Free film processing (but reprints cost), unlimited online storage, guest books, up to 100 free prints on sign-up.	Nicest one here: Clean and well-organized; has the best offline viewer. Focuses on photo processing more than community.
PhotoLoft.com www.photoloft.com	50MB 2	4 x 6, 49¢; 5 x 7, \$2.95; 8 x 10, \$7.99	Albums, photo sharing, cards and gifts, guest books, photo auctions, contests. Minimal cropping tool; no developing.	Another photo community site. Lets you organize photos by category and share them with friends or the world.
Shutterfly www.shutterfly.com	50MB	4 x 6, 49¢; 5 x 7, 99¢; 8 x 10, \$2.99	Sharing only. No albums, custom cards, or gifts; cropping tools and film processing to come in a later version.	Basic printing and sharing for digital images. Can print messages on the back of prints.
Snapfish.com www.snapfish.com	60МВ	4 x 6, 59¢; 5 x 7, 99¢; 8 x 10, \$2.99	Film processing, albums, sharing. No upload utility or cropping tools.	Photos on the cheap. Nearly free developing and printing. Basic-looking site. Requires a credit card number on sign-up.

Club Photo will remove any album that doesn't get at least one hit every 90 days, or you can pay \$39 per year to ensure it remains up.

<sup>&</sup>lt;sup>2</sup> PhotoLoft lets you purchase additional storage space at \$20 per 25MB.

# Better and easier to make your network

safe
secure, and reliable

than
to have to convince
everyone how

SOTTY
you are when something
goes terribly wrong.

Nokia – the brand name you associate with the world's most popular mobile phones – is also an IP networking company. For people who manage increasingly complex network architectures, Nokia delivers market leading firewall, VPN, intrusion detection, and URL filtering applications tightly integrated with Nokia IP Network Application Platforms.

Nokia – building networking products to exceed your expectations.

Platform Family



IP330



**IP440** 



IP650

#### **IP Network Application Platforms**



For the latest white papers and customer profiles, click on IP Networking at

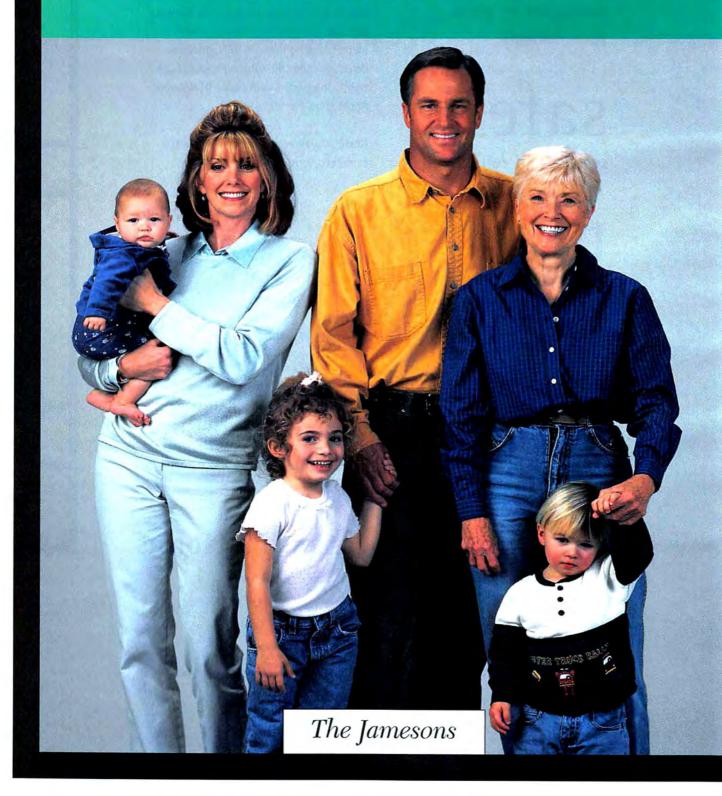
www.nokia.com

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\*Introducts Research, VPN Hardware Market Research (Noxia)Check bint Software Technologies)

# 6 people, 1 house, 2 computers, 1 printer and 1 Internet connection. Is this going to present a problem?



### Not if they start sharing, with a home network.

The Jamesons have a SOHOware® home network.

The family used to fight for time on the Internet. Not anymore. Now, whoever's using the two computers can surf the Web at the same time, via the Jamesons' single high-speed Internet connection.

And the Jamesons no longer have to carry floppy disks from one PC to another every time they need to copy a file or print a document. Instead they share the one printer as well as lots of applications and files.

Amy Jameson and her mother can now even play their favorite computer games together (though Amy is usually the one who wins).

The home network took no time to set up. Mr. Jameson did it himself. He simply bought a SOHOware



With a broadband or other high-speed Internet connection and a SOHOware network, you won't waste time waiting to get on the Web.



With a SOHOware CableFREE home network, no wiring is required, even if your PCs are located on different floors of the house.



As your computing needs grow, it's easy to add additional PCs or peripherals to your home network.

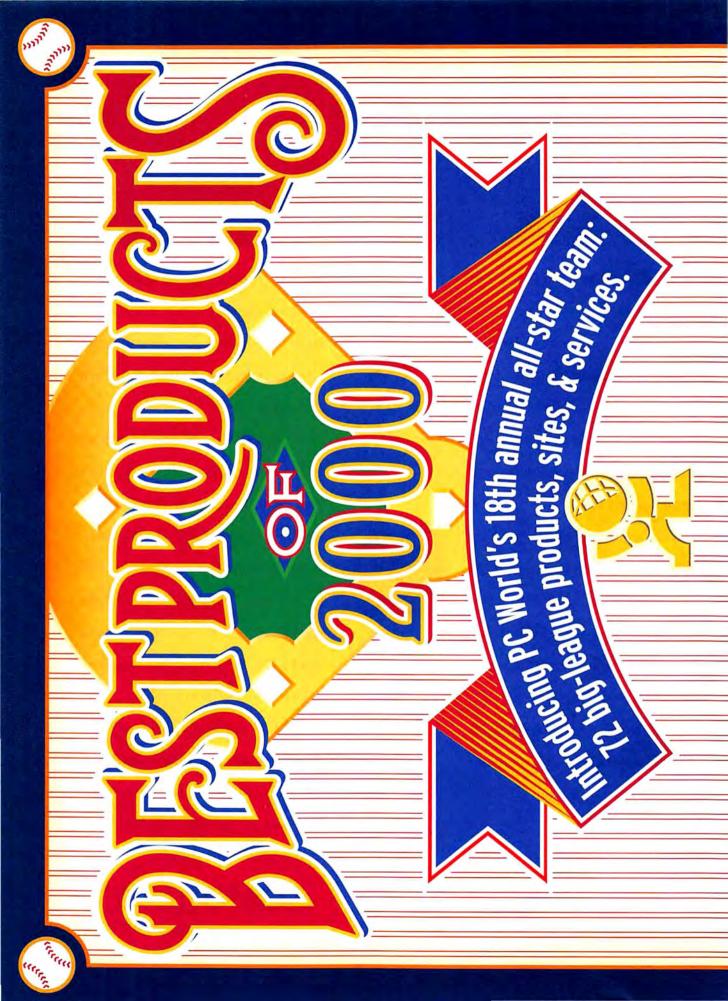
home networking kit off the shelf of the local computer store. It's wireless, so there are no holes to drill or unsightly wires to run across the floor or through the ceiling.

SOHOware offers a variety of affordable do-it-yourself products that can make it easy for your family to be networked just like the Jamesons. Select SOHOware products are sold at leading computer retailers like CompUSA®, Fry's Electronics® and Micro Center®. Or you can buy them online from SOHOware.

To find out more, your family can visit our family at www.sohoware.com. Or call 1-800-632-1118. You'll find out how SOHOware will have your family sharing in no time.

## **SOHO**ware

We make networking personal.™ www.sohoware.com.





isses 104   Quick, wha	Graphics & Publishing 106	Internet Tool Kit	Most Promising Hardware closing in. Both Po	108	Most Promising Software	ner 108 best of the best to p	Most Promising Internet been casting ballots	108	s	Service & Support 110   Web products mal
100 Hits & Misses	100 Graphics	100 Internet	101 Most Pro	101 Newcomer	102 Most Pro	102 Newcomer	103 Most Pro	103 Newcomer	103 Web Sites	104 Service
Product of the Year	Computers	System Basics	Office Essentials	Trend of the Year	Computing at Home	Losers of the Year		Display & Imaging	Audio Additions	On the Road

JULY 2000 PC WORLD

# at's the national pastime?

LL STILL GETS THE NOD, but computing is Cs and the Web are national obsessions these l at work. And just as baseball fans vote for the olay in the All-Star Game, PC World editors have s to select the winners of our 18th annual World

THE EDITORS OF PC WORLD

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As always, performance, value, consistency, and innovation are the four qualities we seek in a World Class winner. Some products here are standouts in a couple of these areas, but the Product of the Year—AMD's Athlon processor—is a superstar in all four. Athlonbased PCs sprinted to the top of our corporate and home PC charts this year, touting record-breaking performance and affordable prices. And AMD's chip was the first to hit a clock speed of 1 gigahertz, beating Intel at its own game.

Our all-star lineup includes rookies (such as Adobe's InDesign, Handspring's Visor Deluxe, and Microsoft's IntelliMouse Optical) and veterans (including Adobe Photoshop, Dell's Dimension PCs, and Microsoft Office). New award categories this year for designer PCs, gadgets, and MP3 players reflect the move toward stylish, fun, and funky computing devices.

Another emerging trend: Web-based services are rapidly encroaching on the

turf of desktop applications. Our top groupware product is the browser-based HotOffice, and we've added categories for Best Web Service (EFax) and Best Free E-Mail (Yahoo Mail). We're not saying that you'll never again have to trek to a computer store to purchase shrink-wrapped software. But a year from now, it could be a whole new ballgame.

Not every award winner here is...well, a winner. Y2K doomsayers, we're relieved to report, are our Losers of the Year (guess they'll have to save those candles and canned goods for the next millennium). Though the Y2K crowd edged out Microsoft for this award, the software giant has been declared a monopoly, and its fate will be decided by legal battles that could drag on for years. And in "Hits & Misses," we take a poke at the most irritating vendors, trends, and events of the past year.

But enough pregame show. Welcome to year 18 of the World Class Awards, PC fans. Play ball!

#### Computers

- Best Corporate PC: HP Vectra series;
   800/752-0900, www.hp.com/desktops
- Best Small-Business PC: Dell Dimension XPS series; 800/388-8542, www. dell.com
- Best Home PC: Gateway Astro;
   800/846-2000, www.gateway.com
- Best Designer PC: Sony VAIO Slimtop series; 888/315-7669, www.sony.com/pc
- Best Notebook: Gateway Solo 9300LS; 800/846-2000, www.gateway.com
- Best Subnotebook: IBM ThinkPad 240; 800/426-7255 ext. 4751, www.ibm.com/pc/ us/thinkpad

THROWING OUT the ceremonial first pitch are this year's best PCs. Corporate users looking for a powerful starter will appreciate HP's Vectra series. Priced at \$2500 and up, Vectras sport built-in networking, an easy-off side panel for breezy upgrades, and a chassis-intrusion

detection mechanism that automatically alerts your company's information systems crew when an unauthorized person opens the PC case.

With fast-paced Pentium III processors, Dell Dimension XPS PCs, starting around \$1200, have more zip than a Randy Johnson fastball. Dell's big units offer good value for small-market teams and won't spend much time on injured reserve, thanks to the vendor's first-rate system reliability.

The Gateway Astro is a perfect fit for rookie home PC buyers. Its all-in-one case is a breeze to set up. And its low, sub-\$800 price is tough to beat. For good looks and solid performance, we like Sony's VAIO Slimtop PCs best. Priced at \$2500 and above, VAIO Slimtops offer innovative, svelte design; sleek flatpanel displays; and lots of storage.

For road trips, the extra-inning battery life of the \$2848 Gateway Solo 9300LS lets you go the distance. If slim and light are key, the \$1500-\$2400 IBM ThinkPad 240

delivers: It weighs just a feathery 3 pounds, but its comfortable keyboard is nearly as big as those on notebooks twice its size.

## PRODUCT OF THE YEAR AMD Athlon



T STARTED AS a spring phenom last season and it has only gotten stronger. Today, AMD's fast Athlon CPU shows no sign of suffering from a sophomore jinx. Architecturally superior to Intel's Pentium III, it's done for the high end what the company's K6 CPU did for the low end: set off intense competition where we all wanted it. The Athlon's performance means AMD can charge profit-making prices that are still low enough to keep Intel honest. Consequently, IBM, Compaq, and others can offer reasonably priced and powerful consumer PCs. Let's just hope that AMD can meet demand and not blow its lead in the late innings.

#### S<mark>ystem Basi</mark>cs

- Best Operating System: Microsoft Windows 2000 Professional; 800/426-9400, www.microsoft. com/windows2000
- Best Application Suite: Microsoft Office 2000 Professional; 800/426-9400, www.microsoft.com
- Best Utility: Ontrack System-Suite 2000; 800/872-2599, www.ontrack.com
- Best E-mail Software:
   Qualcomm Eudora 4,3; 800/238-3672, www.eudora.com
- Best Web Browser: Microsoft Internet Explorer 5; 425/635-7123, www.microsoft.com/windows/IE
- Best Antivirus Software: Norton AntiVirus 2000; 800/497-6180, www.symantec.com
- Best Security Software:

#### TREND OF THE YEAR

#### Broadband Availability

OR THE WEB-addicted among us,
superfast, always-on Internet access is
the hottest ticket this side of field-level
seats at the Giants' new ballpark. And rival
broadband technologies DSL and cable are
finally evolving from a vague rumor into
something more than a handful of users
can get. Yes, glitches happen, security
remains a concern, and monthly fees (\$35 and up)
aren't peanuts. But as broadband gradually blankets
the country, the screech of a dial-up modem could
become as rare as a baseball stadium built for
speed, pitching, and defense.

Network Ice BlackICE Defender; 650/532-4100, www.networkice.com

 Best Input Device: Microsoft Intelli-Mouse Optical; 800/426-9400, www.microsoft.com/mouse

YOU CAN'T MAKE the plays without the basic PC products. Microsoft's Windows 2000 Professional (\$319) is our top choice among operating systems; it combines Windows 9x user-friendliness with NT

management and security. It's a natural fit for office systems and business-oriented notebooks, but home users can stay with Win 98 (or 95) for now. Keep any of these Windows versions in shape with the \$60 Ontrack SystemSuite 2000. Its utilities work better as a team and have a deeper bench than those of rivals Norton and McAfee.

The best application suite is probably the one you already own. For new users, though, we like Microsoft's Office 2000 Professional (\$599) best for its collaboration and Web integration tools. Internet software

essentials include the S50 Qualcomm Eudora 4.3 and Microsoft Internet Explorer 5. Eudora fields e-mail with advanced filtering and color-coded labels; it can catch mail, account settings, and address books from Microsoft Outlook and Netscape Communicator. IE 5 delivers stability, speed, and a number of handy search tools.

Help your PC perform at 100 percent by installing Norton's AntiVirus

2000 (\$40). It offers automatic e-mail scanning and handy update features. The \$40 Network Ice BlackICE Defender foils gate-crashing Net intruders by maintaining constantly updated files of known hacking techniques and changing security levels in response to attacks.

Shuffle through apps with Microsoft's IntelliMouse Optical (\$55); its electronic eye tracks movements over surfaces, and works for left- and right-handed batters.

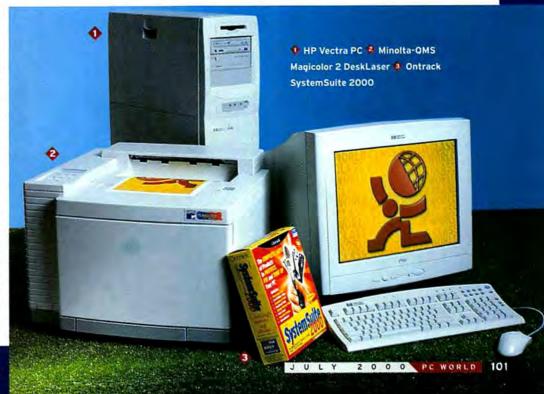
#### Office Essentials

- Best Workgroup Monochrome Printer:

  Xerox DocuPrint N2125; 800/835-6100,

  www.xerox.com
- Best Workgroup Color Printer:
   Minolta-QMS Magicolor 2 DeskLaser;
   877/778-2687, www.qms.com
- Best Personal Information Manager: Symantec ACT 2000; 877/386-8083, www.actsoftware.com
- Best Business Accounting Software:
   Peachtree Complete Accounting 7;
   800/228-0068, www.peachtree.com
- Best Communications Software: LapLink 2000; 425/483-8088, www.laplink.com
- Best Group Application: HotOffice;
   561/995-2220, www.hotoffice.com

A GREAT TEAM DESERVES top-notch equipment—hardware and software that give it the edge that it needs. The \$1299 Xerox DocuPrint N2125 laser printer punches out crisp monochrome text at a zippy 11.7 pages per minute, and it sweetens the deal with such useful paper-handling options as an envelope feeder and a duplexer. For workgroup color-printing, the \$1104 Minolta-QMS Magicolor 2 DeskLaser produces handsome prints at a reasonable price.



On the software side, Symantec's ACT 2000 (\$200) is a well-designed upgrade to a championship-caliber contact manager. Peachtree Complete Accounting 7 (\$249) sports a sleek new look, plus features for helping businesses become e-businesses. For the telecommuters on your roster, LapLink 2000 (\$169) adds even more Internet smarts to a veteran remote-access package. Players on the road can use HotOffice, a Web-based group application, for sharing calendars and contacts and for accessing (and keyword searching through) shared documents from any browser.

## Computing at Home

- Best Personal Finance Software: Intuit Quicken Deluxe 2000; 800/446-8848, www.quicken2000.com
- Best Tax Software: H&R Block
   Financial's Kiplinger TaxCut Deluxe;
   800/457-9525, www.taxcut.com
- Best Reference Software:
   Microsoft Encarta 2000; 888/218-5617.

www.encarta.com

- Best Game: Electronic Arts The Sims; 800/245-4525, www.thesims.com
- Best Ink Jet Printer: HP DeskJet 932C; 800/552-8500, www.hp.com
- Best Personal Laser
   Printer: Brother HL-1240;
   800/276-7746,
   www.brother.com
- Best SOHO Networking Kit: Intel AnyPoint Home Network; 877/649-5817, www.intel.com/anypoint

KEEP YOUR home office in order with some useful software and hardware. Intuit's Quicken Deluxe 2000 (\$59) offers such

features as employee stock option tracking and e-mail alerts about FTC stocksale or purchase filings. H&R Block Financial's Kiplinger TaxCut Deluxe (\$40) includes access to federal and state returns. A flat fee of about \$20 gets you an advance of up to \$5000 on any refund

LOSERS OF THE YEAR

#### Y2K Doomsayers

HEY TOLD US BANKS would fail and planes would tumble from the sky like lethal confettl. Were we nervous? Umm, slightly. When 1/1/2000 rolled around, however, nearly all of the world's

computers turned out to be perfectly aware of what year it was. Maybe the billions invested in Y2K preparedness were well spent; maybe people overreacted. Either way, we have three words for those who built bunkers and hoarded rations: Nyaah, nyaah, nyaah.

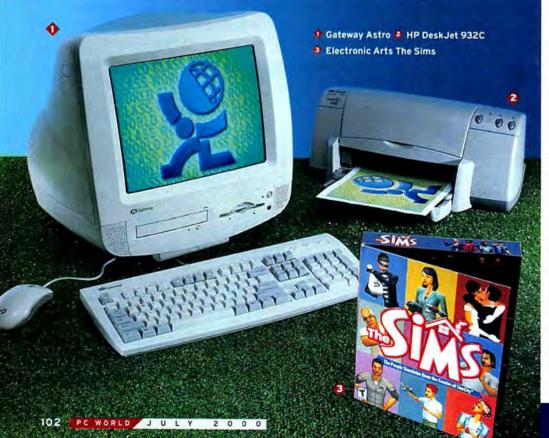
due from an electronically filed return.

As Casey Stengel used to say, "You can look it up!" That's surely true if you have Microsoft's Encarta 2000. For just \$99, it has a 42,000-article encyclopedia, a dictionary with audio pronunciation, and an Interactive World Atlas that lets you

magnify images to the level of street grids.

After working for 3 or 4 hours in the hot sun, your guys need a little recreation. We recommend Electronic Arts' The Sims (\$50). Players create and develop the lives of virtual people, balancing their personalities and guiding them to success in friendship, finance, and romance.

Whether for statistics, fan mail, team logos, or lineup cards, there are always reasons to print. The \$199 HP DeskJet 932C is our favorite ink jet printer, with an attractive if bulbous design, clear text, quick printing speed, and lifelike color graphics. For a personal laser, we recommend the Brother HL-1240. This \$299



model prints clear, sharp text fast.

Now that you have your system ready to go, the best way to get everyone in the house online is the telephone line—based Intel AnyPoint Home Network. For \$69 per PC, the parallel-port version networks two computers and delivers fast enough performance to handle multiple streaming audio and video applications.

#### **Storage**

- Best Hard Drive: Maxtor DiamondMax
   60; 800/262-9867, www.maxtor.com
- Best CD-RW Drive: Plextor PlexWriter 8/4/32 EIDE; 888/675-3986, www.plextor.com
- Best CD-ROM Drive: Toshiba XM-6702B; 949/457-0777, www.sdd.toshiba.com
- Best DVD-ROM Drive: CenDyne CDI CD 00042; 714/979-7367, www.cendyne.com
- Best Removable-Media Drive: lomega Zip 250 USB; 800/697-8833, www.iomega.com

THE STORAGE GAME is all about putting up big numbers. The \$329 Maxtor DiamondMax 60 IDE hard drive comes in at 60GB, making it 38GB bigger than last year's winner, a 34GB IBM Deskstar. And at a mere \$5.50 per GB, this speedy performer is a terrific value to boot.

CD-RW drives—a promising rookie category two years ago—continue to make big strides in price, performance, and popularity this year. The \$200 Plextor PlexWriter 8/4/32 EIDE is our top CD-RW choice; it's easy to install and provides a fast 8X write speed—useful when backing up files or burning CDs. Serious digital-music fans will need a fast CD-ROM drive for extracting songs. Our favorite, the \$60 Toshiba XM-6702B, is a solid performer.

DVD-ROM drives sped faster this year, but a continued dearth of DVD software means you'll probably use your drive to watch movies or read CD-ROMs. Your best bet is CenDyne's CDI CD 00042 (\$147), a competitively priced model with major-league speed and hassle-free installation.

The \$180 lomega Zip 250 USB rounds out our storage team. Bigger and faster than its predecessor (the 100MB Zip drive), it's an impact player on any team.

#### Display & Imaging

- Best Monitor: Sony CPD-E200; 888/ 476-6972, www.sony.com/displays
- Best Flat-Panel Display: Sony SDM-N50; 888/476-6972,

www.sony.com/displays

- Best Graphics Board: Hercules 3D Prophet II GTS; 877/484-5536, www.hercules.com
- Best Scanner: Epson Perfection 1200U; 800/463-7766, www. epson.com
- Best Digital Camera: Nikon Coolpix 990; 800/645-6689, www.nikonusa.com

IF YOUR CURRENT graphics system leaves you squinting like a home-plate umpire, you'll appreciate our picks in display and imaging products. The winners feature state-of-the-art technology, beginning with Sony's CPD-E200—a 17-inch monitor that offers a gratifying combination of price and performance. In addition to its bold graphics quality,

Sony also takes center stage in the flatpanel display lineup, with a razor-thin 15inch LCD, the **SDM-N50**. At \$1499, this sleek but pricey model features built-in sensors that allow the unit to automatically adjust the panel's brightness, depending on the level of ambient light.

the CPD-E200 costs only \$350.

To help drive beautiful images on those monitors, get the \$349 Hercules 3D Prophet II GTS. Its 32MB arsenal of high-speed DDR SDRAM helps it blaze ahead of the competition in 3D games such as Quake 3 Arena and Flight Simulator 2000.

Meanwhile, if you need to transform your important paper documents and photographs into digital files, give **Epson's Perfection 1200U** scanner a tryout. This easy-to-use workhorse delivers fast scanning capabilities, sharp color

and detail, along with USB connectivity—all for a reasonable price of \$249.

Last year, Nikon's Coolpix 950 took the World Class Award among digital cameras. This year, the Nikon Coolpix 990 edges out its predecessor. At \$1000, it's not cheap, but this easy-to-use 3-megapixel camera captures some of the



sharpest, most vibrant pictures we've seen. Although it's chunkier than the 950, it has USB for fast transfers.

#### **Audio Additions**

- Best Sound Card: Creative Labs Sound Blaster Live series; 800/998-5227, www.soundblaster.com
- Best MP3 Player: Creative Labs Nomad
   II; 800/998-5227, www.nomadworld.com
- Best PC Speakers: Klipsch ProMedia v.2-400 THX; 800/554-5665, www.klipsch.com
- Best Voice Recognition Software: Dragon NaturallySpeaking Preferred 4; 800/437-2466, www.dragonsys.com

THESE DAYS, we talk less to each other and listen more to our computers—but they had better sound good, or we'll tune them out. For a game-winning audio experience, you need a great sound card, and Creative Labs' Sound Blaster Live family of products is a good place to start. Teaming the same basic (but great-sounding) hardware with different software bundles, it fields an array of \$99 cards designed for users with different special interests, from gaming to MP3.

MP3 enthusiasts will want to check

out the \$299 Creative Labs Nomad II. With 64MB of memory and support for both the MP3 and Windows Media audio standards crammed into a 3.2-ounce package, the Nomad II is hard to beat.

Our rookie of the year in PC speakers is the \$250 Klipsch ProMedia v.2-400 THX duo. Its THX certification evidences studio-quality sound sharp enough to rival that of many home sound systems.

Computers don't just sound better these days, they've become better listeners, too.

Dragon's NaturallySpeaking Preferred 4 (\$169)

can "learn" your voice in just 5 minutes of coaching. In addition to providing full-blown dictation capability, the software permits Web browsing via voice commands.

#### On the Road

- Best PDA: Handspring Visor Deluxe;
   888/565-9393, www.handspring.com
- Best Gadget: Think Outside Stowaway Keyboard; 760/431-9090, www.thinkoutside.com

- Best PC Card Modem: 3Com Megahertz
   56K Global GSM and Cellular Modem PC
   Card; 800/638-3266, www.3com.com/mobile
- Best Wireless Communication Device: Research in Motion BlackBerry Wireless Handheld (model 950); 519/888-7465, www.rim.net
- Best Projection System: InFocus LP330 Dragonfly; 800/294-6400, www.infocus.com

THIS YEAR'S MOBILE TOOLS use innovative designs to help you take your



#### HITS & MISSES



EVERY SEASON HAS ITS UPS AND DOWNS. Here we look back at some of the past year's most memorable events and bonehead plays in the PC industry—from the funniest dot-com ads to absurd technological innovations and unfortunate copycats.

FOR BEST MAKEOVER of a Formerly Ho-Hum Product, Microsoft's \$109 Works Suite 2000 gets our nod. The update turned a much-maligned suite into a comeback-package-of-the-year many of us would be proud to own. Kudos to Microsoft for finally giving us what we wanted: a cheap way to get Word on a new PC, along with extras like Money and Encarta.

CD-RW DRIVES earn our Most Likely to Kill Other Removable-Media Storage Options Award. Not only have they plummeted in price—to less than \$200—but they provide an attractive alternative for storing MP3 music tracks and archiving other important data.

APPROXIMATELY 450 million Web site ads came out in the past year, all vying to be Most Amusing Dot-Com Advertisement. We liked exactly three. E-Trade's ER-themed "money out the wazoo" ad wins the series, though it's hard not to crack a smile every time you see that Pets.com sock puppet. EDS's stellar cat-herding ad was disqualified after judges learned that the company is technically not a dot-com.

☐ IT'S ABOUT BLOODY TIME Award goes to PC vendors—

namely Compaq, Dell, and Sony-who've warmed up to the idea that beige isn't everyone's hue.

BEST TECH-NOLOGY That Might Be Illegal Soon: Despite My.MP3.com's and Napster's legal troubles, accessing anyone's CD collection via Web connection was très cool. Award goes to Iridium, which let its \$5 billion satellite network fall from the sky after not getting enough money to keep it in orbit. People just didn't want to pay \$1200 for a mobile phone, even if they could use it from Antarctica.

THE NEWLY MERGED AOL/Time Warner monolith gets our vote as Company Most Likely to Inspire George Orwell References. The marriage of an online behemoth and a traditional media giant will create the largest media conglomerate around. The supercompany isn't just in a league of its own—it should be eligible for membership in NATO any day now.

pon't LET THE DOOR HIt You on the Way Out Award goes to Packard Bell, a PC company that merged with NEC and then single-handedly improved the industry's service and support by dropping out of the U.S. market last year.

AMAZON.COM gets the We Have Now Patented the Words A, An, and The Award for patenting one-click technology—the idea of paying for something online with one click. Another patent we imagine it applied for: No-scroll

technology (a page that fits on your screen).

earns our Imitation Is the Sincerest
Form of Product Design Award for building the iMac...er, EOne.
Our read: You can try to clone Big Mac, but if it hits like Mario Mendoza, maybe it is Mario Mendoza.



# Now, APC's Legendary Reliability™ goes anywhere you go

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Introducing APC Batteries for Notebook computers: Legendary Reliability on the go.

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Trust APC. Over 8 million satisfied customers do. APC is the world's leading vendor of Uninterruptible Power Supplies (UPS) and batteries are, let's say, our specialty. APC's batteries are manufactured with the highest standards, have a one year warranty and are supported by APC's award-winning customer support.



Having an extra APC battery with you keeps you available at all times and increases the runtime of your notebook.

Contact APC for more information on your notebook needs and learn how APC's Legendary Reliability can work for you.



#### Key Features:

#### Award-winning customer support available 24 hours a day, 7 days a week

APC support is available to provide comprehensive information and support services 24 hours a day, 7 days a week. Contact our representatives on-line at <a href="http://www.apcc.com/support/">http://www.apcc.com/support/</a> or call (800) 800-4APC.

#### Meets or exceeds all manufacturer's specifications

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If any APC battery you purchase fails to perform as intended, APC will repair or replace, at APC's option, the defective battery or any electronic device damaged by APC's battery.

#### • ISO 9002

APC qualifies for the International Organization Standardization ISO 9002 rating for quality assurance in manufacturing.



To ensure Global Nonstop End to End Networking, look for these notebook power protection products from APC.



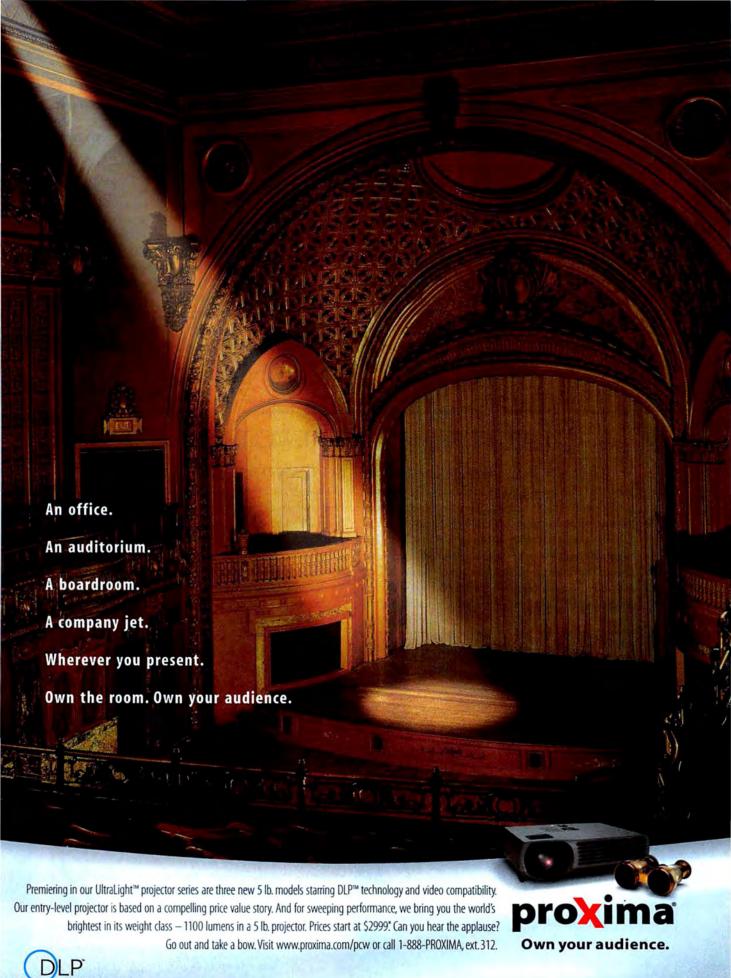




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Web graphics application, giving 5.5 a full suite of Web capabilities. While Photoshop comes with a large-market price tag—\$609—the \$99 Jasc Paint Shop Pro 6 is much kinder to your wallet and still packs quite a punch as a full-featured image editor. Paint Shop Pro takes the extra base, too, by doubling as a drawing program with vector illustration features.

In professional illustration, CorelDraw

9 Graphics Suite remains a clutch performer. For \$470, this do-everything product combines the popular CorelDraw and Photo-Paint in one tightly integrated illustration, photo-editing, and painting package. Macromedia's Dreamweaver 3 Fireworks 3 Studio offers another outstanding partnership. This \$399 package unites Dreamweaver's Web authoring and Fireworks' Web graphics so

you can shorten download time, keep designs consistent, and gain unmatched control over Web pages' HTML code.

The only newcomer to our design and publishing lineup, the \$699 Adobe InDesign 1.5, is a budding star among desktop publishing tools, with powerful navigational features, Adobe .pdf output, and multiple levels of undo. It also integrates seamlessly with Adobe's graphics apps.

#### **Internet Tool Kit**

- Best ISP: EarthLink; 800/395-8425, www.earthlink.net
- Best Modem: S3 Diamond SupraExpress
   56e; 800/468-5846, www.diamondmm.com
- Best Free Web Service: EFax; www.efax.com

- Best Free E-mail: Yahoo Mail; mail.yahoo.com
- Best Freeware: Zone Labs ZoneAlarm 2;
   415/547-0050, www.zonelabs.com
- Best Internet Utility: AskSam Systems
   SurfSaver Pro 2; 800/800-1997,
   www.surfsaver.com

WITH NEW WEB SITES popping up continually and broadband spreading like pennant fever countrywide, now's the time to upgrade your Internet tools. Whether free or not, these products and services make Web surfing sweeter.

To get online, try our favorite ISP, EarthLink, which boosted its cachet by acquiring the number-two national ISP, MindSpring. A new modem can perk up connections, too; we favor the S3 Diamond SupraExpress 56e (\$100) for swift

#### MOST PROMISING NEWCOMERS

#### HARDWARE: Handspring Visor Deluxe

HANDSPRING'S VISOR DELUXE OFFERS an object lesson in how the game changes. Though nothing is radically innovative about this PDA from the inventors of Palm Pilot, the well-conceived package—a tweaked version of the Palm software, slick case design, and low price—is the most sought-after palmtop of the year. Call it the best Palm that Palm Computing never built. Look for the Visor to get even cooler as more add-ins for its Springboard slot (such as a wireless modem module) hit the market. Handspring; 888/565-9393, www.handspring.com

# Committee Commit

#### SOFTWARE: Corel Linux OS

WHEN WE PICKED LINUX as last year's Most Promising Software Newcomer, we cautioned that the Open Source operating system wasn't quite ready for the big leagues. With the release of Corel Linux OS, that's starting to change. Corel emphasizes user-friendliness, with a fast and easy setup routine, a superintuitive version of the KDE user interface, and a specialized tool for downloading updates and patches. The initial release choked on some cutting-edge hardware, but recent updates should banish most setup woes. Most of us won't ditch Windows just yet, but trying this upstart OS is easier than ever: Purchase Corel's WordPerfect Office 2000 for Linux, and you get the OS for free. Corel; 800/772-6735, www.linux.corel.com

#### INTERNET: Zero-Knowledge Systems Freedom

PRIVACY WAS on the minds of PC users this year—and Zero-Knowledge Systems Freedom protects yours like nobody's business. The \$50 software creates a pseudonymous digital identity, called a *nym*, that lets you surf the Web, send e-mail, chat, and use newsgroups without leaving a trace. Freedom routes your data through a network of 150 servers; Zero-Knowledge never knows its source or destination. Your identity remains secret, and personal info will not make its way into the wrong hands. Not just for the paranoid, Freedom offers peace of mind in the nosy, invasive world of the Web. Zero-Knowledge Systems; 514/286-2636, www.zeroknowledge.com

# From 20 to 200 servers, only a scalable Power Array<sup>™</sup> gets reliability done *right*

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#### APC Symmetra® Power Array™: N+1 redundancy for 100% uptime

Data access is critical to both your internal and external customers. Now that applications like messaging, Web integration and E-commerce are deemed mission-critical, losing power to your storage and processors is not an option.

You need to be ready for the unexpected. APC's Symmetra Power Array is the single most highly available UPS in the marketplace. Since power problems are the leading cause of downtime, make sure you're prepared.

Consider how Symmetra protects your business:

- N+1 redundancy design assures continuous availability –
  If a module fails, the others instantly begin supporting the
  full load.
- Scalable power Additional 4 kVA modules can be added to expand to 16 kVA of power capacity (4 unit frame is expandable to 8 kVA)
- Serviceable while load is up and running Additional battery modules increase runtime and all the modules are hot swappable, meaning no downtime.



Now you can easily manage power to your systems. APC MasterSwitch\* in your communications and computer racks can save you time and money by helping your staff to manage power proactively.



PowerView\* is a hand-held control panel for network administrators that configures and controls UPSs in rack, computer room, and datacenter environments.



\*Not having a Symmetra in place would have resulted in lost data, corrupted hard drives and lost time to recover. The Symmetra system has more than paid for itself during this one outage.\*

- Bob Lesher and Charlie Bise, Information Technology, Exel Logistics

APC is a leader in the field of power availability. Our technology grows with your business and can help power protect your new applications as you roll them out. Contact APC today and let APC's Legendary Reliability<sup>\*\*</sup> work for you.

APC Symmetra® Power Array" was recently granted US Patent No. 5,982,652.





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download speed and ease of installation.

**EFax's** free service uses a simple setup to receive e-mail, faxes, and voice mail in one in-box. **Yahoo Mail**, beyond its easy, no-cost e-mail interface, offers a wealth of features, including an outstanding contact manager. Another steal is **Zone Labs' ZoneAlarm 2**, a simple, effective, and free personal firewall that protects your PC on the Net.

For \$30, AskSam Systems' SurfSaver Pro 2 will save Web pages on your hard drive for offline browsing and near-instantaneous searching. (There's also a free version, but it has advertisements.)

#### **Web Sites**

Best Web Portal:

Yahoo.com; www.yahoo.com

Best News and Information Site:

CNN.com; www.cnn.com

Best Shopping Sites (tie):

Amazon.com; www.amazon.com EBay.com; www.ebay.com

Best Travel Site:

Expedia.com; www.expedia.com

Best Recreational Site:

Shockwave.com; www.shockwave.com

Best Online Computer Store:

PC Connection; 888/213-0260,

www.pcconnection.com

NOTWITHSTANDING THE continuing emergence of new Web sites and services trying to become contenders, most of our World Class picks have been around for years.
Yahoo.com, the top
portal, sustains its
excellence as a
search engine, email provider, and
auction house and
continues to add
new features such
as next-generation
wireless access.

Formerly known as CNN Interactive, Ted Turner's online dynasty goes by CNN.com these days. But like Turner's Atlanta Braves, it's

still a powerhouse; in fact, we think it's the best source for news on the Web. (Full disclosure: *PC World*'s parent company, International Data Group, provides most of the technology content for CNN.com.)

Klipsch ProMedia

v.2-400 THX

Both of our shopping site winners, Amazon.com and EBay.com, overcame injury-plagued seasons to capture a share of first place. Both endured their share of foul-ups this year—including denial-of-service attacks that rendered their sites unreachable for a few hours. Still, they continue to delight hordes of fans.

Dive into **Expedia.com's** vast wealth of travel planning information, and you will start longing for your current homestand to come to an end. Expedia.com hits a round-tripper by finding the lowest fares, handling all of your trip details as a one-stop shop, and being superfast.

If you just can't come up with the time to get away on vacation, Shockwave. com offers a wealth of entertainment when you're stuck at home. If the site's online radio stations and animated film shorts, including mini-episodes of South Park, don't grab you, its classic arcade games should fit the bill. Hop online for a couple of games of Joust or Defender, free of charge.

Finding the right place to buy your hardware and software can prove a little more difficult than tracking down MP3s. PC Connection paints the corners with its online store and print catalog, offering a terrific selection of computers, peripherals, and software—along with nice prices and overnight delivery. And even though the store does not offer online custom-configuration tools for PCs (yet), a quick call to its toll-free 24-hour sales line allows you to pick the components that you want on your team.



- Best PC Support: Dell
- Best Software Support: Microsoft

BEFORE HANDING OVER your credit card to make that final PC purchase, it's a good idea to run a background check on the service and support policies of the company that you have in mind. In our most recent Reliability and Service survey (see "PC Reliability and Service: Things Fall Apart," page 114), our readers reported that Dell still provides the best support for desktops and notebooks. And when we asked readers to rate software vendors' service and support, the biggest software company of them all, Microsoft, received top marks.



A GOOD READ: Amazon.com still ranks as one of the very best shopping sites, despite past snags like denial-of-service attacks.

# PC users can't wait to get their heads in them.



#### NEW PC HEADSETS FROM PLANTRONICS®

Listen to your music in complete stereo privacy. Add voice interaction to your multimedia games. Talk to your PC with crystal clear speech accuracy, or chat online in total comfort. Whatever you do with your PC, do it better with PC headsets that deliver the ultimate in comfort, style and sound quality. Simply choose the Plantronics headset that's right for you. Once you use one, you'll never use your PC without it again.

- Noise-cancelling microphones let you talk naturally to your PC or "chat" online with superior voice clarity
- Stereo headsets let you privately relax and listen to MP3 or CD music in a dynamic audio environment
- 40mm speakers and dynamic bass response immerse you in a more intense gaming experience
- Lightweight, ear-cushioned comfort and QuickAdjust\* microphones give you a custom perfect fit every time





















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Call today for the reseller nearest you or visit our Web site for more details. © 2000 Plantronics, Inc. Plantronics and the Plantronics logo are registered trademarks and QuickAdjust is a trademark of Plantronics, Inc. home-field advantage with you on the road. For starters, consider a personal digital assistant. Although Palms still dominate the PDA market, the \$249 Handspring Visor Deluxe stole the limelight this year. It does everything Palms can do and also offers the Springboard module for a useful hardware add-on such as a digital camera, a modem, or an MP3 player. The Visor comes in a guava-colored case.

Want to tote a keyboard with your Palm or Visor? Check out this year's best gadget, Think Outside's Stowaway Keyboard. This full-size \$100 keyboard accor-

dions down to the size of a PDA, making it easy to respond to e-mail or type notes while you bounce along on the team bus.

For notebook users looking to connect, we recommend 3Com's Megahertz 56K Global GSM and Cellular Modem PC Card. It's a bit expensive at \$199, but this speedy performer is wireless, phone-ready, and both Windows- and Linux-compatible.

If you want to go the distance on the

Little League
Sign Up Sheet

Consequence of the state of

adobe indesign 1.5 features solid navigation tools, multiple levels of undo, and .pdf output.

> road with constant e-mail access, con-

sider Research in Motion's BlackBerry Wireless Handheld (model 950). The \$399 pager-esque device lets you send and receive e-mail, check your calendar, or (for an additional \$40 per month) surf the Web—all remotely. The screen is small, but a QWERTY keyboard and lightweight construction make this unique device functional.

Perhaps your mobile mission requires a presentation that delivers. For \$5499, the InFocus Dragonfly LP300 projector weighs in at a trim 4.8 pounds and comes loaded with a manual zoom, built-in speaker and video inputs, and a convenient wireless remote control device.

## Graphics & Publishing

 Best Business Graphics Software: Microsoft Visio 2000 Standard Edition; 800/248-4746,

www.microsoft.com/visio

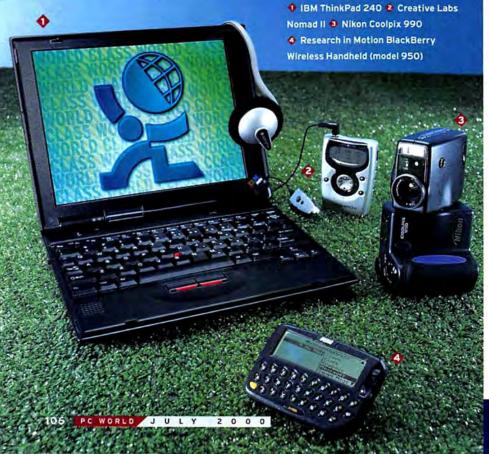
 Best Image Editing Software (tie):
 Adobe Photoshop 5.5; 800/492-3623, www.adobe.com

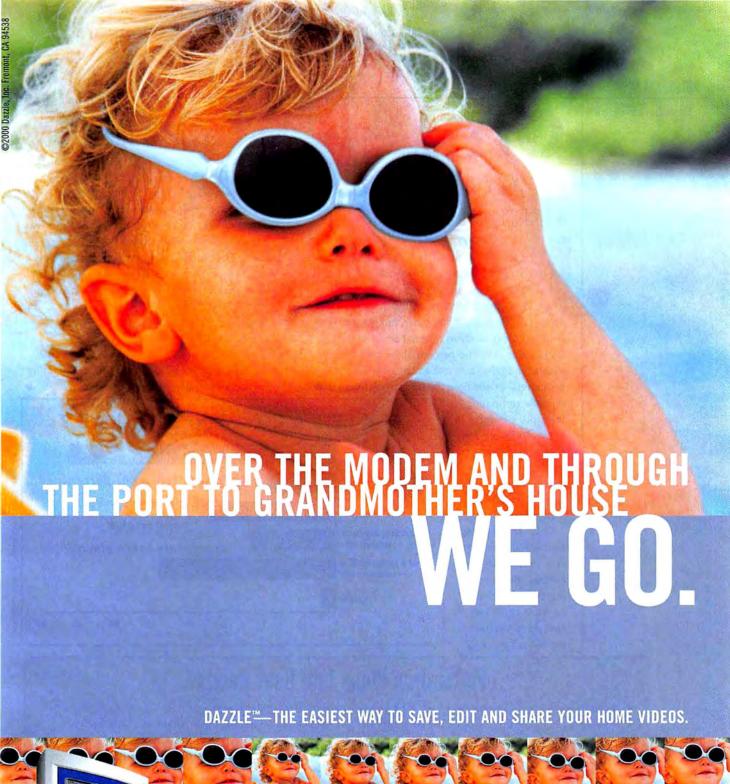
Jasc Paint Shop Pro 6; 800/622-2793, www.jasc.com

- Best Drawing Software: CorelDraw 9 Graphics Suite; 800/772-6735, www.corel.com
- Best Web Design Software: Macromedia Dreamweaver 3 Fireworks 3 Studio;
   800/457-1774, www.macromedia.com
- Best Desktop Publishing Software:
   Adobe InDesign 1.5; 800/562-3623,
   www.adobe.com

A FEW VETERAN players dominate bigleague design and publishing software. In the business world, the \$199 Microsoft Visio 2000 Standard Edition comes to bat as a great diagramming tool with a slick new interface, Web features that enable you to convert diagrams to HTML, and faster drawing speeds. Who says flowcharts are boring? Not Microsoft, which just acquired this product.

It seems as though Photoshop has been synonymous with photo editing since the Dodgers moved to the West Coast. Adobe Photoshop 5.5 continues the tradition. In this version, Adobe augments Photoshop's already rich feature set with ImageReady 2, its high-end





A face like this should be shared—and with Dazzle" digital video systems it's never been easier. Starting at just \$99, we provide everything you need to save, edit and share digital quality video using your own PC. Now you can send your custom videos to friends and family via tape, CD, e-mail or streaming video from your web

Dazzle provides everything you'll need to get started—from bardware interface to video capture, editing and publishing software.

Available at Best Buy, CompUSA, Sears, Micro Center and other fine retailers.

site. To find out more or view an online demo, visit us at dazzlepc.com.

Dazzle\*

continued from page 76

COMPUTING TO GO!

ADDITIONAL SUPPLEMENT SPONSORS:

Xircom www.xircom.com

# Off Road

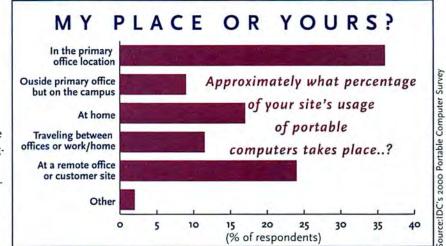
portable computers largely as second computers for mobile professionals, leaving a desktop system as the primary computer. But according to an April, 2000, study by International Data Corporation, a full 60 percent of the portable computers purchased this year will be used as primary computers. In addition, the IDC survey found that

portable computing takes place every-where, including the central office, customer sites, remote offices, home offices and in hotels and planes (see chart).

Thus, the challenge for the mobile manager is to replicate the central office computing experience on a portable computer. It isn't easy, but here are some tips on

keeping your sanity:

- Consider upgrading to Microsoft Windows 2000, an operating system built with several unique features to support mobile computing.
- Don't expect connectivity miracles from wireless networks yet. They are still no more reliable than cell phones, and not terribly secure for transmitting sensitive data.
- Investigate port-expansion solutions (like Xircom's PortStation, below).
- Realize that we are still a good three years away from fully replicating the central office computing experience for mobile managers.



#### PortStation Plugs Into User Needs

ow often have you thought, "Wouldn't it be great to have more than just one port on my computer to connect to multiple devices or networks?" Fortunately, Xircom has read your thoughts and answered with its PortStation system, enabling fast and easy connections

Xirtions and limit from the limit fr

from your notebook or desktop to networks, the Internet, or multiple devices.

More importantly, users can purchase only the additional connectivity they

need. Users can choose from modules including 10Mb Ethernet and 56K modern modules, or other modules for connecting to scanners, printers, CD-ROMs, storage devices and a host of other peripherals. PortStation allows users to connect multiple devices of the same type, or different types, for maximum customization and configuration options.

PortStation is completely PC-brand independent, taking advantage of a standard Universal Serial Bus (USB) connection rather than the standard proprietary connections found in docking stations. So even if you upgrade your system, the PortStation will move with you, not be moved aside with the old system.

To help first-time PortStation buyers through the purchase process, Xircom has created three pre-configured "starter kits," each adapted to different individual needs. For more information, click on www.xircom.com.



RealPort: Because things that stick out get busted.

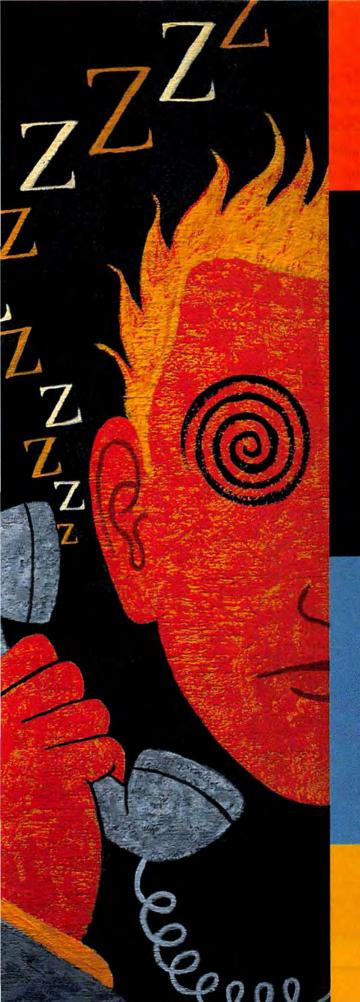


No POP-OUT JACKS TO BREAK. No dongles to tose. Only the RealPort' family of Integrated PC Cards from Xircom features patented, built-in connectors for ultimate reliability. In fact, they're guaranteed for life. Choose from two models: Original RealPort or new modular RealPort2\* Cards that allow you to customize your own solution. To learn more about the world's most reliable PC Cards, visit: xircom.com/rppc



Lower Total Cost of Ownership • Higher Throughput • Maintenance-Free • Easy Install • LED Connection Status Available in several flavors: 10/100 Ethernet, 56K Modem, Integrated ISDN (no cables!), and Wireless Data [GSM]. New technologies: DSL, Bluetooth, Home Phoneline Networking, Wireless Ethernet.





PC Reliability & Service

**PC WORLD** 

# oart

In an exclusive survey, 16,000 readers told us that the quality of PC reliability and service has slipped. Imagine if your fridge were this much trouble.

**By Mitt Jones** 

Illustrations by James Steinberg

#### Imagine a world where your refrigerator was as reliable as your PC. It doesn't sound too appetizing, does it? You'd probably end up eating out a lot, and your kitchen would soon smell like a landfill.

But fear not. The average refrigerator is (fortunately for your stomach) a great deal more dependable than the average computer. Of course, compared to a PC, your good old fridge is a much simpler appliance: It has fewer functions, its only peripherals are kitchen magnets, and it doesn't outdate itself or need to interact with software—not yet, anyway. And if you accidentally put a load of fresh vegetables in the drawer marked fruits, your

fridge will not crash. With your computer, though, simple acts like installing a scanner can lead to deadly freeze-ups.

Alas, while we long for the day when PCs are as unfailing as fridges or other trusty household appliances, we know we're dreaming. In fact, the responses from almost 16,000 PC World subscribers in our PC Reliability and Service survey just reaffirmed what we've been saying for years: PCs still have a long way to go. Compared to the findings in our last report in January (www.pcworld.com/ jan99\_rs\_update), our most recent data shows that computer owners are experiencing more problems, the quality of service has dropped in many instances, and fewer people are truly happy with their PCs and the companies that make them.

Take Gateway customer Monte Lawson, for instance. This Selah, Washington, resident is one unhappy camper. He ran into problems shortly after he purchased his Gateway home system. Now, two years down the road, he's still having trouble. The machine refuses to boot from a power-off state until he hits the reset button. "You can hear the hard disk for a few seconds, and then the system just stops," recounts Lawson. "You don't see BIOS messages, [you don't see] anything." Lawson is disgruntled because Gateway has not been able to resolve the problem, even after some 25 calls to the company. "They replaced the power supply, the motherboard, and all the memory, to no avail." he recalls. To make matters worse, it often takes Lawson 30 minutes or so to get through to a live support technician.

Lawson is not alone in his grumblings. Owners of Micron and Quantex home PCs also had some negative things to say about their PC makers' product reliability and support. At the other end of the spectrum, Dell stays at the top of the class in work and home PCs, despite a drop from five stars to four in its overall service rating for home machines. For a detailed breakdown of each manufacturer's ratings across our six reliability and six service measures, turn to our charts on page 118 for Home PCs, page 120 for Work PCs, and page 122 for Notebook PCs.

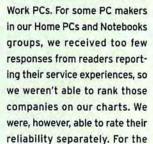
#### **Overall** Winners and Losers

IT'S LONELY AT THE TOP. Of the nine com-

panies we rate this time, only one PC maker scored high enough to rank as Outstanding: Dell alone earned this distinction, for both its Work and Home PCs. The good news: Overall, no companies rank below Fair. But that's not saying much. The bad news?

Since our last report in January, we see no overall improvement. Some companies dropped down a tier: Gateway slipped from Good to Fair in Home PCs and Notebook DCs Micron and Quantov took a similar fall

in Home PCs, as did Hewlett-Packard in



reliability-only charts regarding CyberMax, EMachines, NEC, and Sony (Home PCs) and Acer, Fujitsu, HP, Micron, NEC, and Win-Book (Notebooks), turn to page 121.

Home PCs	Work PCs	Notebooks
DUTSTANDING	OUTSTANDING	OUTSTANDING
Dell	Dell	none
GOOD	GOOD	GOOD
IBM	Gateway IBM Micron	Dell IBM
FAIR	FAIR	FAIR
Acer Compaq Gateway Hewlett-Packard Micron Quantex	Compaq Hewlett-Packard	Compaq Gateway Toshiba

Source: PC World Reliability and Service survey, based on online participants' responses recorded between December 1999 and January 2000. Companies are listed alphabetically within each rating tier. See "A Word About the Star Scores" (opposite page) for a description of our methodology.

#### **BATTLE OF THE APPLIANCES**

INDUSTRY LUMINARIES have long told us that PCs should be as easy to use and reliable as any household appliance. So how do they stack up in reliability against appliances and other consumer electronics? We studied product repair histories for 13 types of products-including desktop PCs-published by Consumer Union's Consumer Reports. The compari-

### A Word About the Star Scores

STARS AWARDED CORRESPOND to the companies' relative rankings, which are based on the raw scores in each of the following 12 measures. For specific details on stars and their corresponding scores, see www.pcworld.com /jul00/reliability.

	Legend	Survey average'
	Percent of PCs with prob- lems Percentage of PCs that have had at least one problem needing repair.	Work PCs: 43 percent Home PCs: 57 percent Notebook PCs: 47 percent
	Problems per year Average number of problems per PC per year of age, for the brand's systems.	Work PCs: 12 Home PCs: 18 Notebook PCs: 1.0
ity	Problems on arrival Percentage of PCs that did not work properly when they were first turned on.	Work PCs: 6 percent Home PCs: 7 percent Notebook PCs: 5 percent
Reliability	of PCs that were nonfunctional when they were first turned on.	Work PCs: 1 percent Home PCs: 2 percent Notebook PCs: 0.9 percent
	Component failure Percentage of PCs with at least one failed component whose failure was attributable to the system's manufacturer.	Work PCs: 21 percent Home PCs: 31 percent Notebook PCs: 27 percent
	High satisfaction with reliability Percentage of respondents who indicated that they were very satisfied with their PC's reliability.	Work PCs: 67 percent Home PCs: 64 percent Notebook PCs: 67 percent

METHODOLOGY PC World's Reliability and Service survey was conducted in conjunction with Survey.com (formerly World Research) of Campbell, California, and IDC Consulting. PC World's sister company in Framingham, Massachusetts. The survey was fielded in December 1999 and January 2000. Over the course of the survey, we received 15,895 reports from verified PC World subscribers describing their PCs' reliability and their experiences, if any, in getting service. eir PCs' reliability and their experiences, if any, in getting service.

Using this data, a team of *PC World* editors and research experts

Legend Survey average' Short hold time Percentage Work PCs: 68 percent of phone service recipients Home PCs: 55 percent who waited on hold for 5 Notebook PCs: 70 percent minutes or less. Quick resolution Percent-Work PCs: 78 percent age of service recipients Home PCs: 65 percent whose most recent prob-Notebook PCs: 65 percent lem was resolved in five days or less. No resolution Percentage Work PCs: 6 percent of service recipients most recent problem was of service recipients whose Home PCs B percent Notebook PCs: 7 percent never resolved. Knowledgeable tech sup-Work PCs: 76 percent port Percentage recipients rating the port Percentage of service Home PCx: 72 percent Notebook PCs: 80 percent knowledge of the technician who helped them as "excellent" or "good." Sincere effort by tech Work PCs: 82 percent support Percentage of ser-Home PCs: 77 percent vice recipients rating the Notebook PCs: 85 percent sincere effort of the technician who helped them as excellent or good. High satisfaction with ser-Work PCs: 45 percent vice Percentage or recipients who indicated recipients who indicated with the Home PCs: 47 percent vice Percentage of service Notebook PCs: 54 percent that they were very satisfied with the service they received.

analyzed the reliability and service performance of each manufacturer's home, work, and notebook PCs, based on 12 measures. In each of 6 reliability and 6 service measures, we ranked each company from best to worst. We determined a company's overall rating based on the sum of its weighted reliability and service scores, as well as on the number of stars it earned in the individual measures.

Figure refers to the average score among all companies rated in the respective measure in PC World's PC Reliability and Service report.

son wasn't exactly apples to apples-age and usage varied-but it provided a general means of comparison. We averaged the percentage of problems per company for different kinds of appliances.

According to those numbers, roughly 22 percent of computers break down each year. That makes them significantly worse on average than VCRs (9 percent), bigscreen TVs (7 percent), clothes dryers (7 percent), and refrigerators (8 percent), but about as problematic as vacuum cleaners (22 percent). The only product we found with a problem rate higher than a computer's is the riding lawn mower and lawn tractor, which showed an average problem rate of about 25 percent.

Ray Kent, president of The Service Center, an independent appliance repair shop based in Portland, Oregon, says that from his perspective, PCs are generally more problematic than other appliances. Kent reports that refrigerators, washers, and ranges often last seven years before needing service; microwaves, five years; and dryers, four to five years.

Contrast that with the results of our survey of PC users: On average, our subscribers report close to two problems each year with their home computers.

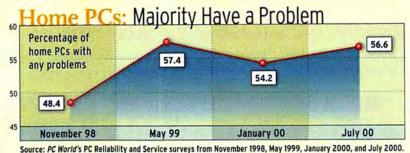
#### PROBLEMS AT HOME

GORDON JENKINS has had his fair share of hassles with his two-year-old Micron home PC. First of all, some of the keyboard keys stopped working, and then the cooling fan went out. The company sent him new components. "When I called Micron, it took anywhere from 15 to 45 minutes to get through," says Jenkins. "But once [the company] got on it, they took care of everything pretty quickly."

Jenkins also reported that he called Micron about software-related problems, too. Predictably, the techies responded by saying that the problems lay with the programs-not the hardware-and urged him to call the software vendors. "But the problem is, when you don't know what exactly is causing the problem, you don't know who to call." His latest gripe? To date, he has not been able to get his new RCA digital camera to work with his PC.

Jenkins has had some problems with his home appliances, but only after years of faithful service. His refrigerator's ice maker has begun sticking, after four years of use. His three-year-old VCR (built into his TV) now refuses to eject tapes. And he recently had to replace his washer-dryer after six years because it gobbled up the belt during the spin cycle.





#### PCs LAGGING BEHIND

SO WHY ARE COMPUTERS SO much less reliable than other appliances? Basically, computers just do a lot more, says Gartner Group senior research analyst Mark Margevicius. "It's not a fixed function appliance. It's a great, great Swiss Army knife. You can use it many different ways." And that means it can break down in many different ways.

But what about the individual components-the CD-ROM drive, the modem, the hard drives? Each of these does only one job, yet almost a third of our home PC owners told us they'd had to replace at least one such faulty component. Margevicius blames the PC industry's breakneck pace of change. Companies like Intel, for instance, are racing to produce faster processors and new chip technologies. PC makers must change their systems to accommodate these improvements-even if they'd rather focus on upgrading the stability of their existing products. "Market conditions and...Intel won't allow them to do that," said Margevicius. "The rate of change just adds to the uncertainty and unreliability [of computers]."

Gary Cotshott, vice president of services for Dell, agrees that making the everchanging pieces of a PC work together is a constant challenge. "You have levels of hardware and software integration that frankly you couldn't even contemplate in, say, a refrigerator," he says. Cotshott also cites the continuing explosion in new soft-

> ware and new operating systems as a source of difficulties. "You can't test every possible combination of every [single] thing that may be in a machine," says Cotshott, adding that Dell does take

HOME PCs IN SLIGHT decline,	Relia	bility	Service							
ay readers. Gateway, Micron, and Quantex fall a tier.	Percent of Problems problems per year		Problems on arrival	Dead on arrival	Component failure	High satis- faction with reliability	Overall reliability	Short hold time	Quick resolution	No resolution
**** OUTSTANDING		1998	Q	<b>90</b> M		4	score		0	*
DELL Top of the heap (again).	****	****	****	****	****	****	****	***	****	****
**** GOOD										
IBM Very few components go south, but owners not happy with service.	****	***	****	****	****	***	****	****	****	***
*** FAIR										
ACER Worrisome number of PC problems on arrival.	**	***	*	***	**	**	**	****	***	***
COMPAQ Lousy reliability in spots, service not much better.	**	**	**	****	****	**	**	****	***	***
GATEWAY Middling reliability, service in decline.	***	***	***	****	***	***	***	**	***	***
HEWLETT-PACKARD Components unlikely to die, but owners are unhappy.	***	**	***	****	****	**	***	***	***	***
MICRON Spotty reliability, so-so service and support.	***	****	**	****	***	****	****	**	***	***
QUANTEX Tons of hassles from the very start.	***	***	*	****	***	***	***	**	***	****

Company listings within each rating tier (Outstanding, Good, and Fair) are alphabetical. Five stars is the best possible rating; one star, the worst.

great pains to test its products thoroughly. And buyers often load their own collection of hardware onto systems. This too can cause all kinds of compatibility problems.

Our survey results show worsening PC reliability and service. In the months since we last presented our ratings (in the January 2000 issue), several companies have dropped in rank from Good to Fair overall, and many fewer earn a Good rating. Overall, the Home PCs group did a little bit worse than Work PCs and Notebooks groups: Home computer owners had to deal with a slightly larger number of PC problems overall and poorer service.

#### HOME PCs

FEW HOME PC makers received high report card grades: Only Dell earned the top rating of Outstanding, and only IBM got a Good. The other companies-Acer, Compag, Gateway, HP, Micron, and Quantex-ranked Fair. For Gateway, Micron, and Quantex, that's a step backward.

In our six reliability measures, the average result for four measures showed no change from last time, while two of them got worse: Readers report 50 percent more problems per year among the rated companies than they did in our last surGORDON JENKINS, a Micron customer, reported some hardware problems and endured long waits on hold.

vey. And users aren't happy. The percentage of people who say they're very satisfied with their home PC's reliability slid almost 10 points, from 73 percent in January to 64 percent this time.

In our six service measures, ratings in

the three subjective ones (where we ask for an opinion instead of a hard number) got worse. The technicians seem to be less attentive and less knowledgeable-the percentage of readers who rated the sincere effort and knowledge of the per-

SLIP-SLIDIN' AWAY: The current state of home machines is worse than that of work PCs, according to our readers. Gateway, Micron, and Quantex all plunged from Good to Fair overall, due to substantial drops in their service scores (see "Overall Winners and Losers," page 116). Within the individual measures, reliability scores dipped

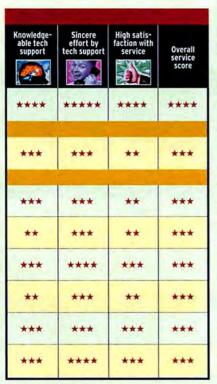
also-but not as much as service. Acer, Compag, and Quantex dropped in overall reliability ratings: Quantex fell from Good to Fair because of the increase in its percentage of PCs with any problems, problems per year,

and problems on arrival. Acer and Compaq both went from Fair to Poor-Acer's percentage of problems on arrival is rated as Unacceptable (just one star). Micron took a knock in five out of six reliability measures, but it still managed to cling to its overall reliability score of Good. Dell reigns as reliability king, scoring Outstanding or Good across all measures.

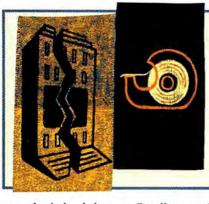
Meanwhile, service suffers. Half the companies saw their overall service score sink: Gateway, Micron, Quantex, and Dell (yes, even Dell) all dropped a notch. Gateway has troubling scores for "Short hold time" and "No resolution"-it loses two stars in each of these measures.

> Fewer Gateway customers say that their calls were picked up in 5 minutes or less, and a sizable percentage of people reported that their problems were never resolved. Micron takes a hit in all six service measures, and Quantex fares only a little better, taking a hit in three areas.

Big Blue improves a little in service-readers are happier with the time the company took to sort out snafus, and they say fewer of their problems were never resolved. Despite a decline in Acer's reliability, this PC maker rates higher on every single service measure (by a star) this time around, enabling it to move up a spot from Poor to Fair for overall service. -Aoife McEvoy









son who helped them as Excellent or Good dropped from 84 to 77 and from 78 to 72, respectively. Most significantly, the percentage of respondents who were very satisfied with the service they received from their PC maker sank 12 points, from 59 to 47, among rated companies. But at least you don't have to wait longer to talk to the support technicians. The percentage of people who got help within 5 minutes remains about where it was last time-55 percent. Fewer users say their problems were resolved quickly, and more say their problems were never resolved.

Why should home computers be more troublesome? Part of the problem lies

with the home computer itself, and the other part can be traced to the limited expertise of the people who buy them, says Randy Giusto, vice president of the desktop and mobile division at International Data Corporation. "Think about it: [Home PC owners] have less experience using PCs and no IS department," explains Giusto. "Troubleshooting a problem is always a nuisance because they have to do it at odd hours." And since most home machines cost less than corporate systems, he says, PC manufacturers have cut back on component quality, service plans, and warranty offerings, in order to achieve an attractive price.

#### WORK PCs

IN THIS GROUP, Dell is again the only vendor our respondents rated Outstanding. Gateway, IBM, and Micron earned Good ratings, and Compaq and HP received a Fair grade. Among these vendors, only HP dropped a tier since January.

The good news is that most measures of reliability-the number of problems per year, the number of machines that were dead on arrival from the manufacturer, and other figures-reveal little change since last January. But customers are becoming harder to please. The percentage of PC World subscribers who say they're very satisfied with their work computer's reliability slid from 72 percent to 67 percent.

When it comes to servicing work systems, customers are at least getting their questions answered more quickly. A higher percentage of respondents

## READERS RATE OTK

READERS SAY Dell is stellar,	Relia	bility	Reliability									
but Compag and HP owners give thumbs-down on satisfaction.  ***** OUTSTANDING	Percent of PCs with problems	Problems per year	Problems on arrival	Dead on arrival	Component failure	High satis- faction with reliability	Overall reliability score	Short hold time	Quick resolution	No resolution		
DELL Top-notch reliability across the board.	****	****	****	****	****	****	****	****	****	***		
*** GOOD	The State of			V. J.								
GATEWAY Dependable machines, so-so service.	***	****	****	****	***	***	****	***	***	***		
IBM Reps try hard, but they may not know much.	****	***	***	***	****	***	****	****	****	***		
MICRON Only a few problems a year, middle-of-the-pack service.	****	****	***	****	****	***	****	***	***	***		
*** FAIR			The same			Sec. 1.2		770				
COMPAQ Reliable systems, yet customers not impressed.	****	***	****	****	****	**	****	***	****	***		
HEWLETT-PACKARD Low satisfaction all around.	****	***	****	****	****	**	****	***	***	***		

Company listings within each rating tier (Outstanding, Good, and Fair) are alphabetical. Five stars is the best possible rating; one star, the worst.

## Other **Companies** to Watch

YOU MAY HAVE noticed that some familiar PC company names are missing from our Home PC and Notebook PC groups-like Sony and Cyber-Max, in the case of home PCs. for instance. The reason? We received too few responses from readers whose computers needed service to produce an accurate ranking. Below a minimum number of responses, a few bitter-or ecstatic-computer owners can throw off the tally. A number of vendors missed this threshold for the service measures, although we were able to assign them a reliability rating (see the chart).

#### **DEBUT OF EMACHINES**

FOR THE FIRST time, we gathered enough responses from EMachines customers to rank the company's reliability-and it earned a rather pedestrian rating of Fair overall. The company ranked Good in four of the six measures-customers didn't have too many component failures to complain about, for instance. But Emachines didn't fare so well in two measures: Owners reported on average a whopping four problems per year-the worst on our listresulting in a rating of Unacceptable (one star) in this measure. Despite the other, more impressive scores, only a small percentage of owners said they were very satisfied with their PC's reliability-the company rated Poor in this measure.

As far as EMachines' service is concerned, early indications are not very positive, but again those numbers could have been skewed by a few disgruntled customers. When we contacted EMachines for its response, the company declined to comment. -Aoife McEvoy



For more details on the reliability scores of EMachines and other

manufacturers, check out www. pcworld.com/jul00/reliability.

#### READERS RATE RELIABILITY

#### Home PCs

\*\*\* FAIR

CyberMax Sony **EMachines** NEC

#### Notebook PCs'

\*\*\*\* GOOD

**Fujitsu** Hewlett-Packard Micron

#### \*\*\* FAIR

Acer NEC WinBook

Only reliability ratings are presented here for these companies because we did not receive enough responses about service experiences to generate an overall score. For a detailed breakdown of these PC makers' reliability scores, visit our Web site at www.pcworld.com/jul00/reliability.

said the company's support technicians were answering in 5 minutes or less. Whether the service people know what they're talking about is another matter. Only 76 percent of users rated the techies' knowledge as Excellent or Good, down from 82 percent in January. And again, readers' satisfaction with service is way down. Only 45 percent say they're very satisfied, compared to 55 percent in our previous survey.

#### **NOTEBOOK PCs**

DESPITE SOME REAL improvements in reliability, no notebook maker could muster an Outstanding rating in our latest poll. Dell and IBM achieved rankings of Good; and Compag, Gateway, and Toshiba came in at Fair-our readers had ranked Gateway as Good back in January.

But notebooks are less prone to breakdowns than they used to be, readers tell us. The percentage of notebooks that have had any problems and the percentage with problems out of the box are down.

Readers' ratings in most service measures stay the same, though more problems were never resolved. Overall, readers' satisfaction with service holds steady.

#### SERVICE COUNTS

AS THE RELIABILITY of many systemsespecially Home PCs-slides, the role of service becomes even more impor-

Knowledge- able tech support	Sincere effort by tech support	High satis- faction with service	Overall service score
***	****	****	****
***	***	***	***
**	****	***	***
****	***	***	***
**	***	**	***
**	**	**	***

IT'S SAD BUT TRUE. Our current study shows that service and support for work machines have declined slightly in quality since we published our last report in January. According to our readers, some PC makers are making it

harder for customers to resolve their problems-if they can resolve them at all. More people are reporting that some breakdowns never get fixed. And the quality of technical support has deteriorated in spots.

Dell's PC reliability score emerges unblemished: Once

again, it earns five stars in all six reliability measures-you can't get better than that. Compag and Hewlett-Packard made some headway on component failure-both PC makers' scores rose a notch. On the downside, Big Blue customers report more problems per year, a bigger percentage of problems on arrival, and a bigger percentage of DOA machines.

When it comes to service, both Micron's and HP's overall ratings slid from Good to Fair.

> Micron's service took a hit in four out of the six measures; HP slipped in five. A greater percentage of Dell and IBM users told us their problems were never resolved. The positive news? More customers' calls are getting picked up in less than 5 minutes-Big Blue is still

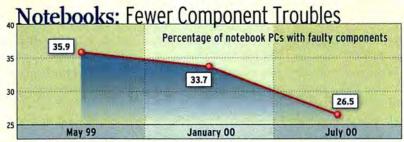
quickest to pick up the phone. Customer satisfaction with Gateway, IBM, and Micron is middleof-the-pack; worse, Compag and HP earn a Poor rating (two stars) for customer satisfaction.

READERS RATE

**Work** PCs

-Aoife McEvoy





Source: PC World's PC Reliability and Service surveys from May 1999, January 2000, and July 2000.

tant. Many customers will tolerate a misbehaving machine if the company that built it can get it running again quickly.

Ask James Baker. Baker, who lives in Sutter Creek, California, has had several problems with his Dell system over the past three years, including the quick failure of his first monitor. He's also replaced an internal Iomega Zip Drive and a CD-ROM drive. Yet Baker considers himself a happy customer and says his next system will also be a Dell. His reason? "Dell has been very good about responding and sending replacements."

Our survey results suggest Baker's satisfaction with Dell's service is typical for Dell customers. An impressive 75 percent of Dell home PC owners said they were very satisfied with the company's service.

Micron suffered a substantial skid in our Home PCs service area, dropping at least one notch in all six service measures. The company intends to reverse the trend by improving communication between its front-line support for its consumer PCs (usually provided by a third party) and its internal staff, says Gary Welling, Micron's vice president of service and support. Another disappointment: Gateway sank in five out of the six service measures for home PCs and notebooks, resulting in a slide from Good to Fair in overall service in both charts. Interestingly, unlike Dell and other companies, Gateway funnels calls for its notebooks and consumer PCs to the same support staff. In contrast to our results, Gateway's vice president of client care Jim Hobby claims that the company's own studies showed that its service has been steadily improving.

#### LOOK TO THE FUTURE

OUR LATEST SURVEY seems to point out a depressing trend. Reliability and service of many PC products are declining just as our expectations in those areas are rising.

In service, as IDC's Giusto noted, part of the trouble is that as PC prices drop. vendors try to cut support costs. Companies like Compag, Dell, Gateway, and Micron are beefing up their online technical support, hoping to ease pressures on phone support. Dell is leading the way with its new E-Support solution: Resolu-

# Notebook PC

NO NOTEBOOK MAKER IS	Relia	bility	Service							
good enough to rank Dutstanding. Gateway's service drags it down.	Percent of PCs with problems	Problems per year	Problems on arrival	Dead on arrival	Component failure	High satis- faction with reliability	Overall reliability score	Short hold time	Quick resolution	No resolution
**** GOOD								20 15	Lew X	7
DELL Some problems but pretty good service.	***	***	****	****	****	***	****	****	****	***
IBM Owners are unlikely to be stranded.	****	****	****	****	****	****	****	****	****	****
*** FAIR					7	7				
COMPAQ Lots of problems, and fixing 'em takes too long.	**	**	****	****	***	**	***	***	**	***
GATEWAY Many customers still left hanging.	***	***	****	****	***	****	***	***	**	**
TOSHIBA Yery few faulty PCs, inconsistent service.	***	***	****	****	****	***	****	****	***	***

Company listings within each rating tier (Outstanding, Good, and Fair) are alphabetical. Five stars is the best possible rating; one star, the worst.

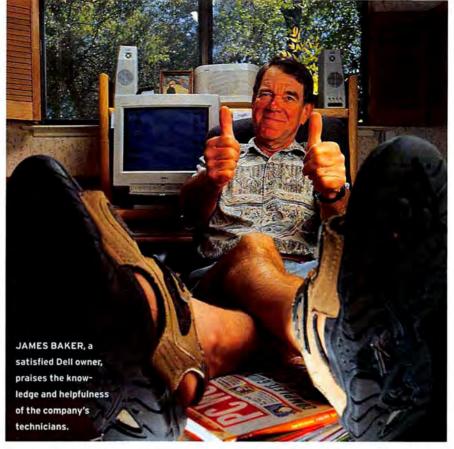
tion Assistant. This feature provides live chat online with a real technician. At the time of this writing, Dell was offering Resolution Assistant only to its server and WebPC customers, but Dell's Cotshott said the service would be available for all product lines within a few months.

Micron's Connected support.com tech support portal takes a different approach. The portal includes hardware diagnostics along with software and driver updates. but the real advantage lies in the company's implementation of "self-healing" software. In theory, self-healing software allows users who mistakenly delete or mangle an application's essential files to get the program back up and running.

Gartner Group's Margevicius expects self-healing to gain in popularity, thanks in part to the self-healing framework built into Windows 2000. "The technology is still new, so it's going to take some time, but the concept is a good one," he says.

Companies like Dell and Gateway are discussing the idea of self-diagnosing hardware. It would warn the user that a certain part was likely to fail soon. For the time being, any comprehensive approach to self-diagnostics is at least a few years away, because some underlying industry standard would need to be established.

Of course, Web-based support and other new technologies could wind up saving PC makers money and providing customers a better computer experience. But no one is suggesting that manufac-



turers disconnect their phone support lines just yet. The most likely scenario for the next few years is that new approaches to Web-based support will gain acceptance gradually while companies continue to serve the bulk of their customers through old-fashioned telephone support.

As for the day when PCs will be as reliable as refrigerators, we're not holding our breath. The scary prospect is that the current may turn in the opposite direc-

tion. Appliance makers are talking about smart refrigerators that can e-mail you when the milk has spoiled. If manufacturers start selling those, we may see refrigerators that are only as reliable as PCs. So get ready to eat out.

Mitt Jones is a contributing editor and Aoife McEvoy is a senior associate editor for PC World. Senior technical editor Shane Ray contributed to this article.



THERE ISN'T A WHOLE lot of shaking goin' on with our Notebooks chart, especially when you compare it to the Work and Home PCs charts. Only Gateway's rating changed, sliding from Good to Fair overall.

Compag users report having a greater number of problems per year. Overall satisfaction with reliability sank for Dell and Compag, but the two

companies cling to their reliability scores of Good and Fair, respectively.

Gateway, IBM, and Toshiba show some improvement in two reliability measures apiece-but IBM and Toshiba's service scores haven't gone up and Gateway took a noticeable hit. A greater percentage of people report that Toshiba never resolved their problems, and a smaller percentage of customers rate the knowledge of the vendor's techies as either Excellent or Good.

> Gateway's scores are more worrisome. Its score for short hold time fell to Fair (from Outstanding in January); quick turnaround time is now rated

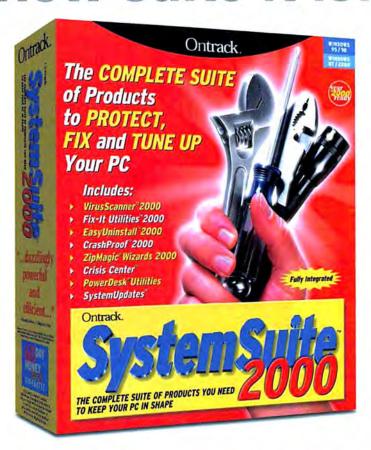
> > Poor (versus Good last time); and more users say their PC problems were never resolved.

Speaking of unresolved problems, top dog Dell rates only Fair in that measure; in our last -Aoife McEvoy survey it earned five stars.

READERS RATE

Notebook PCs

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# MP3 is about more than digital tunes. It's about hardware, software, Web sites, and a few niggling laws. Here's what you need to know and which products to use. BY ERIC HELLWEG 2 0 0 0 PC WORLD 12

MADONNA. PUBLIC ENEMY. Ginger Mac-Kenzie? At first glance, you might think one of these names just doesn't belong. Look closer, however, and you'll see that a common trait unites them: Each has released songs-or in the case of rap superstars Public Enemy, an entire album-online. And though just a few short months ago the Austin, Texas, native Ginger MacKenzie was selling sodas and beer on a golf course during daylight hours and crooning away at night in the city's many clubs, these days she supports herself wholly on CD sales, thanks almost exclusively to the Internet.

"I put some songs up on MP3.com last year," the singer recalls when asked to explain her meteoric CD sales. MP3.com has become the first step for many unknown acts who hope to use the Internet to advance their careers. MacKenzie's bluesy, soulful songs caught the ear of the MP3.com staff, which named her "Best Pop and Rock Artist of 1999." That distinction helped generate hundreds of thousands of free downloads of her songs from the site, which in turn resulted in tens of thousands of CD sales "in places like the UK, Syria, just about everywhere," she says. MacKenzie parlayed her popularity into an opening slot at last year's





MOVE AND GROOVE: The Creative Labs Nomad II wins Best Buy accolades for thoughtful features such

as 64MB of storage, sturdy construction, bright LCD screen, fast USB connectivity, audio controls that can be accessed via a remote control, as well as MusicMatch Jukebox software for managing your MP3 files.



Lilith Fair, as well as a publishing contract with Warner Chappel.

Granted, for every Ginger MacKenzie, thousands of still-unknowns hope that the come-one, come-all approach of MP3.com and other free song warehouses online will somehow produce the break each longs for. But musicians aren't the only interested parties taking advantage of the Internet as a distribution channel. Corporate heavyweights from AOL to MTV want a ride on the digital music bandwagon. The clout such companies wield means that more music from big-name talent will soon be available for download.

Where did MP3 come from and why do

music fans love it? What are the best digital music players and software programs? How do you find good-and legal-digital music on the Web? We answer these questions and more in our sound test of the digital music revolution.

#### **RUNNING ON MP3**

THE MUCH-HYPED MP3 isn't the only audio format on the Web. At least four others-ACC, Liquid Audio's eponymous technology, RealNetwork's Real G2, and Microsoft's Windows Media-crowd the field. But MP3 has become the de facto format because it's readily accessible and lacks built-in security mechanisms.

#### TAKING IT TO THE STREETS: MP3 HARDWARE DEVICES

MP3 PLAYER	Street price (5/4/00)	Comments	Interface
Audiovox MP-1000 800/290-6650 www.audiovox.com	\$180	HOT: Easy-to-read LCD, inexpensive. NOT: No equalizer, no FM tuner, flimsy case.	Parallel
Casio MP3 Wrist Audio Player 800/836-8580 www.casio.com	\$249	HOT: Intuitive audio software. NOT: Least storage here; lacks memory upgrade options; minuscule control buttons; pricey for what you get.	USB
Creative Labs Nomad II 800/998-1000 www.creative.com	\$330	HOT: Icon-based LCD screen; easy-to-use audio software; includes 32MB Smart Memory card; 32 presets on FM tuner. NOT: Chintzy warranty.	USB
HanGo Remote Solution Personal Jukebox 858/974-7253 www.pjbox.com	\$749	HOT: Huge storage capacity, great headphones. NOT: Very expensive, no backlight.	USB
12Go EGo 888/388-4246 www.i2go.com	\$269	HOT: Translucent design; includes cassette tape adapter; converts e-mail text into MP3 files. NOT: Hard to sync with e-mail client; bulkier than most players; DOS-age LCD shows only one line of text.	USB
I-Jam 888/326-4526 www.ljammusic.com	\$220	HOT: Sporty, palm-size design; FM tuner; nice bass and treble presets. NOT: Tiny, hard-to-read LCD; lacks features others have.	Parallel
RCA Lyra Player 800/336-1900 www.lyrazone.com	\$199	HOT: Good bass and treble presets; large LCD; loud sound; bright backlight. NOT: No toll-free support.	Parallel
Samsung Yepp 800/726-7864 www.samsungyepp.com	\$229	HOT: Nice earphones; stores phone numbers; doubles as minirecorder. NOT: Large fonts on LCD.	Parallel
Sensory Science RaveMP 2100 480/609-9200 www.sensoryscience.com	\$269	HOT: Icon-based LCD; voice-records; runs on one battery. NOT: Cumbersome file transfers.	Parallel
Sony Memory Stick Walkman 800/222-7669 www.sony.com	\$400	HOT: Slim, streamlined design; generous warranty; nice controls. NOT: Clunky MP3 downloads; no FM tuner; expensive.	USB



Best Buy

• Yes O No

Current models ship with 32MB.

When you buy a CD, you don't need the record company's permission to tape it for your car. And you don't need to monitor how many different devices in your house contain transferred versions of the songs. MP3 continues that tradition: It allows you to transfer songs from your computer to any MP3-playing device without worrying about how much of the music you own. But formats such as Liquid Audio don't extend that freedom to the user; and neither do the preliminary guidelines for the record industry's alternative digital music format, the Secure Digital Music Initiative (SDMI). Instead, these proprietary formats include security hooks that determine both the allowable number of copies you can make of a song and the types of devices you can play the songs on. Of the MP3 players we reviewed for this article, only Sony's Memory Stick Walkman plays SDMI-compliant music.

#### C30, C60, C90, GO!

LIKE .JPG, .WAV, and even .doc, MP3 is a file format. It dates back to 1992, when the Fraunhofer Institute in Germany invented a technology that at the time seemed innocuous. Discussed only in esoteric technology circles, the "Moving Pictures Experts Group, Layer 3" format (mercifully shortened to "MPEG-1, layer 3," and colloquially called MP3) introduced tighter compression to the existing video and audio MPEG format. Using MP3, scientists were

able to shrink files to about an eighth of their original size.

Not long after the code's release, other people realized that the format was ideal for compressing and sharing music. The sound approached CD quality and an average 4-minute song shrank to about 4MB-small enough to share over the Internet or from PC to PC.

One of the earliest hindrances to online music was its lack of portability. No one wanted to be confined to a computer when listening to music. Into this breach have leaped a multitude of vendors-from stalwarts such as Sony to fledglings like HanGo-each offering a device for playing digital music.

First out of the gate was Diamond Multimedia, with its Rio 300. Not long after the Rio was announced, however, the Recording Industry Association of America, a lobbying organization for record companies, sued Diamond, claiming that its product violated the 1992 Audio Home Recording

12-GO EGO and Casio MP3 Wrist Audio Player

Act, a law stipulating that digital recording devices must come encoded with an antipiracy copy management feature.

The RIAA lost that case in late 1998. Because the Diamond Rio 300 didn't record music, the court ruled, the device was a "space shifter"-functionally equivalent to a cassette player that was used by its owner to replay songs copied from a CD the person owned. The ruling helped the Rio and similar units compete with other portable music devices.

The competition has yielded significant consumer benefits. When the Rio 300 debuted, it cost around \$300 and could hold only 32MB (about 32 minutes worth) of music. Most newer models todayincluding our Best Buy, Creative Lab's Nomad II (see previous page)-come with twice as much storage capacity and range in price from \$229 to \$400. They feature added microphone capability. radio tuners, and other accouterments.

Scheduling problems with the manufacturer prevented us from reviewing

	Primary	features							Ott	er feati	ıres				
Storage	Upgrade media	Battery	Audio management software	Album title	Artist name	Track title	Volume	Bit rate	Equalizer	Track repeat	Battery life	FM tuner	Micro- phone	Warranty	Tech support hours/days
32MB	SmartMedia	2 AAA	Proprietary	•	•	•	•	•	0	0	•	0	0	90 days	8/weekdays
16MB <sup>1</sup>	None	1 lithium ion	Proprietary		•	•	•	0	0	•	•	0	0	1 year	9/weekdays
64MB	Compact Flash	1 AA	Creative Audio Center	•	•	•	•	•	•	•	•	•	•	90 days	13/weekdays
4.86GB	None	1 lithium ion	Proprietary	•	•	•	•	•	• /	•	•	0	0	1 year	9/weekdays
64MB	Compact Flash/ Micro Drive	2 AA	MP3agent	•	0	•	•	•	•	•	•	0	•	1 year	24/daily
32MB	SanDisk Multimedia Card	2 AAA	Jam Station	0	0	0	•	0	0	0	•	•	0	1 year	9/weekdays
32MB	Compact Flash	2 AA	RealJukebox 1.1	•	•	•	•	•	•	•	•	0	0	1 year	14/weekdays 9/weekends
64MB	SmartMedia	2 AAA	RealJukebox 1.0	•	•	•	•	0	•	•	•	0	•	1 year	24/daily
64MB	RaveMP Manager	1 AA	RaveMP Manager	•	•	•	•	•	•	•	•	0	•	90 days	15/weekdays 8/weekends
64MB	Sony Memory MagicGate Stick	1 lithium ion	Sony OpenMG Jukebox	•			•	0	•	•		0	0	1 year	24/daily

the most recent Diamond Rio model, the 600. For a brief review of the Rio 600's older sibling, the Rio 500, see "Why Don't We Do It on the Road?" (www.pcworld. com/novoo/music).

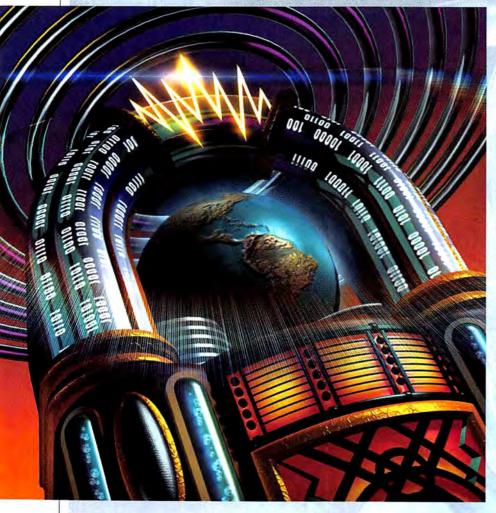
Unlike CD- or cassette-based portable players, MP3 players have no internal moving parts, so the music won't skip or change pitch when the device is jostled or dropped—a boon to exercise buffs. MP3 devices are far from perfect, however. Though the standard memory size has doubled from 32MB to 64MB, that's still good for only about an hour of near-CD-

quality music. In addition, the MP3 files you listen to remain on the storage device until you replace them with other tunes transferred from your PC, a process that can be time-consuming and frustrating.

Speed is a serious concern here. Some manufacturers include USB support in their latest models, which greatly increases the file transfer speed. To run a USBenabled player, you must use Windows 98 or 2000 as your operating system. As broadband technologies such as DSL and cable modems become more commonplace, digital music fans can download files much more quickly. (Compressing a typical 4-minute song into MP3 takes as little as 15 minutes on a 56-kbps modem.)

For audiophiles, sound quality is another weakness of MP3. The standard MP3 encoding rate is 128 kbps, whereas true CD sound quality typically demands 256 kbps or better. A higher encoding rate translates into a larger MP3 file that occupies more hard drive or portable player space. And if you stream music through your PC (see "Borderless Radio," page 134), minuscule errors such as split-second lapses during a streaming session can





ANT TO LISTEN TO MP3 files on your PC? Then you need file-playing software. You have lots of options to choose from, but not all offerings are worth considering. Some software "jukeboxes" come prepackaged with MP3 players. Most software players are available online for free, while a few cost around \$30 if you elect to upgrade to the full-featured versions. But packages bundled with portable MP3 devices tend to offer limited options beyond rudimentary options geared toward getting the files from your hard drive to your portable hardware player.

We look at two categories of file-playing software. Basic programs like Winamp and Sonique (available at PCWorld.com's File-World, www.fileworld.com/magazine) allow you to play only the music files you currently own. They won't let you convert CDs into MP3s. The second group-MusicMatch Jukebox, RealJukebox, and Windows Media-are more robust, allowing you to play, record, create playlists, and perform a host of other audio management functions.

#### MusicMatch Jukebox 5

(www.musicmatch.com)

Our favorite program excels in design, robust features, and extras. Its interface is clean: The top section is a standard CD player interface, the middle is your track library, and the bottom is a CD recorder. You can create playlists that group songs by artist, genre, mood, or whatever category you choose. MusicMatch also lets you record CDs for free at a high bit rate. MusicMatch gains extra points for including such information as artist info, genre, and even an area for art or

result in hicsaudible breaks in the stream of digital sound data.

AUDIOVON Now let's take a bird's eye view of digital music, focusing on how it works, how to use it, and what to watch out for. We'll report our findings for ten of the top portable players and recommend a couple that are worth the price. (See the chart on page 126 for details on the players we looked at. and visit PCWorld.com for full reviews of AUDIOVOX MP-1000 and I-Jam

also look at some of the leading software programs used for playing MP3 files on your computer (see the "Audio Players" sidebar below for details). And we'll discuss how to find great music online. how to transform your PC into a radio receiver, and how to minimize the chance that innocently downloading MP3 files will land you in the slammer.

every player.) We'll

### MP3s FOR NOTHING

FINDING MP3 FILES isn't hard-just add .com to the end of MP3, and you'll find well over 250,000 free songs awaiting you. But you probably won't be familiar with the vast majority of them, since anyone can post music on MP3.com.

Until recently, major record companies avoided the Internet as a distribution medium and refused to make their catalogs available for download. That's changing. The pending merger of AOL, Time Warner, and EMI will align two music powerhouses (Warner Music and EMI

a photograph to accompany a track. You must gather most of this information on the Net, but it's nice to have a place to put it.

### RealNetworks' RealJukebox 1.1

(www.real.com)

This player is unduly intrusive and lacks addons such as lyrics, extensive track information, and photos. It has a dastardly habit of asserting itself as the default player for such things as sound files and CD tracks-even if you'd prefer to use another player. RealJukebox does permit CD recording, but you get sparse information: track name, artist, and track length. Listeners who miss the days of LPs with artwork and extensive liner notes will stare blankly at the RealJukebox interface. RealJukebox Plus, a \$30 upgrade version, adds the ability to record at CD quality.

### Sonique 1.30

(www.sonique.com)

Sonique is the flashiest of the software players. One look at the tagline-Made by Aliensand you know you're in for an otherworldly visual experience. Sonique 1.30 shuns the standard box-based Windows interface in favor of an elliptical bubble shape, at the center of which a montage of psychedelic imagery moves with the music being played. Sonique is almost as popular as Winamp, largely due to its enormous base of usersupplied designs, or skins. Sonique's Web site displays hundreds of different skins you can download for your player. But if this level of interactivity isn't your bag, Sonique will disappoint. The player's interface is somewhat cryptic, and its mouse-based volume control is suitable for contortionists only.

### Winamp

(www.winamp.com)

AOL acquired this popular program last year. Its relatively small size-2.5MB to 4MB, depending on the components you want-and whiz-bang graphics help push it ahead of the rest. Winamp consists of four main components: the standard cassette player-like

interface (play, fastforward, rewind), a ten-band graphic equalizer, a playlist editor that keeps track of your songs, and a mini-browser window. You can easily choose the components you want on the device's screen, and the program does list song titles. but Winamp loses points for not providing added information such as lyrics.

Plus, the minibrowser seems superfluous:

When we tried buying a CD, the app launched a separate, non-Winamp browser.

### Windows Media 7

(www.microsoft.com/windows/windowsmedia)

Microsoft's foray into the MP3 game, this application radically departs from its predecessor-a tiny app that many music fans considered absurdly weak. The new version wants to be your media hub, handling everything from CD and radio audio to downloadable music to broadband and video. We looked at a beta of the application, which will be part of the post-Windows 9x consumer operating system (code-named Millennium) expected in the fall of this year. Microsoft spokesperson Crystal Lee Patriarche says that the final version will be much smaller. Windows Media's everything-to-everyone



UNMATCHED EASE: With MusicMatch's Jukebox 5, you'll get a clean interface that shows a CD player at the top and a track library below.

approach has advantages and disadvantages. On the plus side, the player can scan your hard drive for all media files and list them within a large play screen. But it also stores such unwanted system sounds as the "You've got mail" ding. Overall, we liked the song information display, the radio screen, and the drag-and-drop portable player file transfer; but the version we tested crashed too often for us to give it more than a marginal recommendation. PC World will review the shipping version when it's available.

Publishing) with AOL, which may put their artists in the Web spotlight. Dream-Works, Sony Music, and other big labels have begun experimenting with free downloads, and most of their sites offer at least some kind of downloadable music.

But downloading tracks from labels' sites onto a portable player carries its own perils. First, the labels that offer downloads package them in secure, proprietary formats-such as Liquid Audio or Microsoft Windows Media-that many of the portable MP3 players we tested can't play. Creative's Nomad II plays Windows Media, and Sony's Memory Stick Walkman plays its own format (ATRAC3), which you can convert MP3 files to using included software; but the majority of players we reviewed handle only MP3 files, confining files created in other formats to the PC on which they were originally downloaded.

Moreover, many major-label sites offer only streaming versions of songs, so the songs can't be saved on your hard drive or transferred to your MP3 player. And sound quality varies with the speed of the stream and the quality of the connection.

Even if you can find desirable MP3 files on major labels' sites, you probably don't want to visit 15 different sites to hunt

efore you post an MP3 file to your personal Web site or download one from a friend's FTP site, you'd better think twice. Just ask Jeffrey Levy, a University of Oregon student.

Levy posted MP3 music files-along with PC software and digital copies of movies-on his Web site, making them available for others to download for free. In August 1999, he was convicted for distributing copyrighted materials without permission. (See "MP3 and You" at www.pcworld.com/heres\_how/mp3players.)

Copyright law protects artists and copyright holders from having their work used in unwanted ways. You must obtain the copyright holder's explicit permission to copy a work, or you risk spending up to five years in prison and paying as much as \$250,000 in fines. By the time you read this, legal authorities that enforce piracy laws will have even tougher penalties at their disposal.

The law also applies to digital audio formats including MP3, Windows Media, and RealAudio. To keep yourself out of trouble, you need to find out how to obtain legally distributed files and you need to know what you can do with the files after you get them.

Lawyers, analysts, MP3 companies, and the recording industry agree that there are three legitimate ways to collect MP3 and other digital audio files: You can buy them, you can get permission to download them for free, and (in the case of MP3 only) you can make them from CDs you own.

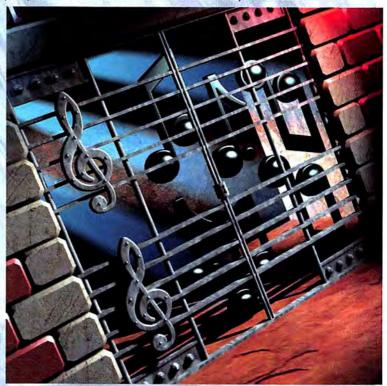
Buying an MP3 file from a Web site such as BMI, Listen.com, or EMusic.com confers the same rights on the purchaser as buying a CD at a record store-irrevocable permission from the copyright holder to privately play and listen to the music the file contains.

You can obtain the same type of permission from a copyright holder-usually an artist who isn't signed to a record contract-to download free versions of recordings. These are available at omnibus sites such as MP3.com and at smaller sites run by the bands themselves. In general, the copyright holders are so eager for you to listen that they'll give you the file for free.

Finally, you can make MP3 files from audio CDs that you own. Thanks to a clause in the copyright act known as the fair use privilege, you can buy a CD and later make an MP3 copy of it, as long as the copy is for your own personal use. Similarly, you can make copies of files that you legally own to play on a portable MP3 device.

Those three methods are about as far as you can go legally. Posting files on your Web site for friends to download is a no-no, unless you have explicit permission from the copyright holder to do so. Neither can you lawfully download an MP3 from a site, unless the person running the site has the copyright holder's permission to give it to you. That puts most MP3s you run into on the Webincluding at least some of those on MP3.com-off limits.

Meanwhile, FTP sites, search engines, and applications such as Napster pose a lot of temptations. Smaller, more personal sites may say they have permission to distribute files, but their claim is not always true-and if it's not, you could be liable for illegally downloading a song. If you're unsure, stick to downloading files from commercial sites such as BMI and Sony. -Michael Gowan





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Diskettes



DVD-RAM



SuperDisk diskettes



down 15 different songs. Fortunately, music hubs like Listen.com and EMusic.com consolidate a great number of currently available tunes.

EMusic.com sells MP3 versions of albums and singles at a discount rate. Most of its repertoire comes from independent rock labels (mostly unknown bands), but you'll also

find a healthy number of jazz and blues tracks too. Single songs cost \$1, and most albums go for about \$9.

Listen.com doesn't warehouse any of the songs, but points you to other sites where you can download them. When a visitor clicks on a Listen.com genre-Latin, for example-Listen.com lists all the links to legally downloadable music files of that type. (For a discussion of the legal issues MP3 raises, see "Know Your Rights," page 130.) The site categorizes more than 10,000 legal songs, and is adept at describing an unknown band by comparing it to a more familiar act.

### SPY IN THE HOUSE OF LAW

BECAUSE THE RIAA has taken an aggressively litigious stance toward digital music-shutting down thousands of pirate sites, many operated by college students-finding legally downloadable MP3 files can be a bear. And obtaining pirated MP3 files is so complicated-not to mention, tainted by the element of receiving stolen property—that the thrill of acquisition may not be worth the considerable effort and the lingering bad taste.

Some sites that dispense unauthorized MP3 files have devise elaborate (and even silly) schemes to protect themselves and to thwart all but the most dogged musicseekers. To reach one site, for example, you first have to page through ten dif-

ferent sites, some containing offensive content. Once on a site, you're told to type in a URL or click a letter in a banner ad. After visiting several different sites and clicking various letters, you eventually acquire a password that gets you into the MP3 site, where you



RCA LYRA Player, Samsung Yepp, and Sensory Science RaveMP 2100

can paw through the illicit merchandise.

A far simpler way to get songs for your MP3 player is to convert your CD collection into MP3 files. Most of the software players we reviewed include a recording component (formerly known as ripping device). Some players automatically record songs as you play them, converting them to MP3 files on the fly; with others, you have to hit a record button first. Album tracks and titles are automatically listed in your player through an archival database known as CDDB, which is built into most popular software players. As long as you refrain from starting a Web site where you post your converted CDs for anyone to download, copying your music from a CD to your computer and from there to your portable hardware player is legal. In fact, it's protected under the "space shifter" clause of the Audio Home Recording Act.

Once you've become bored with your

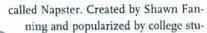
online

CD collection and you've scoured the aforementioned sites, where can you go to find the hottest new bands online? Unfortunately, in most cases the only material available is

pirated, though the number of legal, popular songs online is increasing.

One of the most popular ways people can find and share pirated material is via a free, downloadable software program

> SONY Memory Stick Walkman and HanGo Remote Solution Personal Jukebox



dents, Napster has ignited a firestorm of protest from artists as well as from the RIAA. When you install and open the program, your computer acts as a server, uploading any MP3 files you have on your hard drive. At the same time, you can search the hard drives of others logged on to the Napster network.

For the time being, Napster software is legal. But that might not remain true for long: The company is currently fighting an RIAA lawsuit that could be decided by the time you read this. Many artistsnotably Metallica and Dr. Dre-object to Napster technology because they receive no royalties from copies of songs downloaded in this way-unlike those sold on mainstream sites. Other artists, however, have high hopes for Napster, believing it lets potential fans taste-test their music, ultimately leading to increased CD and concert ticket sales. At any rate, college students, major labels, online music aficionados, and artists anxiously await the outcome of the lawsuit.

### ARE TRENDS ELECTRIC?

NAPSTER WATCHERS AREN'T the only ones curious about the future of digital music. Will CDs be obsolete in five years?

HEAR HERE: For detailed descrip-

tions of the ten portable hardware

players we reviewed in this article,

plus a more extensive discussion of the legal

issues that are addressed in "Know Your

Rights" (page 130), visit our Web site at www.

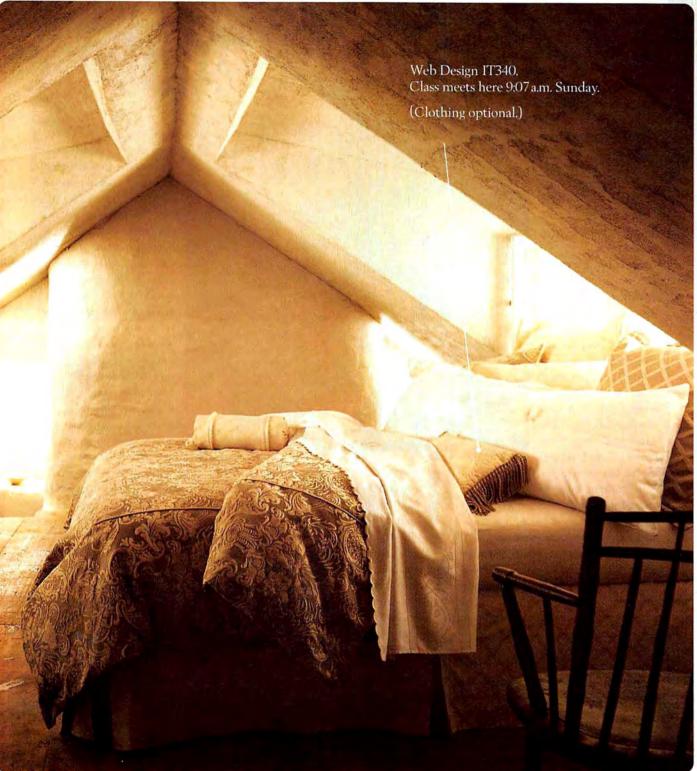
pcworld.com/jul00/digimusic.

If not, will they cost less? Will major labels ever embrace digital music and begin to put more-if not all-of their content online?

It's too early to

tell. But certain tea leaves offer strong clues about how digital music will unfold. Here's a peek into the pekoe:

Labels take the plunge: If the AOL/Time Warner/EMI merger receives federal approval, the combined talent arsenal of the Warner Music label and EMI publishing company-featuring such Midasgoes-platinum stars as Tom Petty, Cher, and Madonna-will have at its disposal America Online's massive distribution capacity and brand identity. Clearly, the power to control placement of music



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in an online market is a major priority.

Other labels are sticking their toes into the digital waters as well. Sony Music has been ramping up its efforts (in part because it now has a secure music player, the Memory Stick Walkman, which you can use to play tunes). Universal Music has announced that it will allow RealNet-

works to distribute software that can be used to download and play secure versions of some of its music. If that plan stays on track, some Universal songs could be available for listening by the time you read this.

Artists take the plunge: The rap group Public Enemy made headlines last year when it became the first commercially successful group to exclusively release an album online. The album There's a Poison Goin' On was offered only on Atomic Pop Records, an online music label. Then James Brown followed suit, sell-

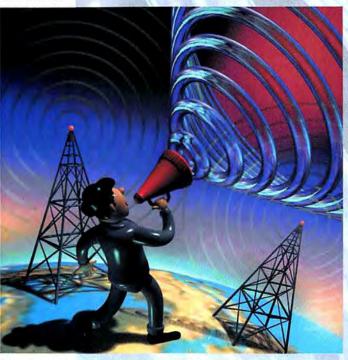
ing his Christmas for the Millennium and Forever album online before it reached stores. Look for more artists to follow their lead in the future-if not with albums. then with free downloadable singles.

Portable players get smaller and more powerful: There's no reason why portable MP3 players can't follow the rest of the computer industry. Once RAM prices start dropping again, you can expect to see players that can store more songs.

What does this wall of sound portend? You'll have more choice-more music, cheaper and more powerful players that read more formats, and quicker downloads. You'll also have a clearer conscience as more songs from your favorite musicians appear online, this time legally. And you won't even have to think twice about it, since digital tunes will be almost everywhere. Now that's music to our ears.

Eric Hellweg is a founding editor of Business 2.0. He covers digital music for Spin, among other publications. Michael Gowan is an associate editor for PC World.

# DERLESS RADIO



n 1981, Dave Davies of the Kinks lamented the sorry state of radio in his song "Around the Dial." He sang, "FM, AM, where are you?" Nineteen years later, the answer is: on the Internet.

A quick search around the dial of the Internet yields thousands of radio streams, ranging from online versions of popular

offline megawatt broadcasts to commercial-free broadcasts that emanate from someone's kitchen. Thanks to very low or nonexistent setup costs, Net radio gives anyone with a record collection that must be heard the opportunity to share it. You can listen to everything from high school football games in rural Texas to news broadcasts from the Indian subcontinent to all-bluegrass formats around the Web.

If you're content to listen rather than create, you'll find many ways to enjoy Net radio. In most instances, you don't need much special software or equipment to listen to most online stations. Typically the two requirements are free streaming software (RealNetworks' RealAudio or Microsoft's Windows Media) and a reasonably fast connection to the Internet. Be aware that even a 56-kbps connection can be marred by awkward stream breakups, especially if you listen during peak hours.

Streaming radio stations exist all over the Internet. An excellent place to find mainstream options is at Yahoo's Broadcast.com. Fine-tune your

listening selection with genre-specific choices at Spinner.com or ImagineRadio.com. If you want to be a DJ, however, we recommend Shoutcast.com. It requires a fairly extensive setup process (including downloading and installing the free, proprietary Shoutcast software), but the site has attracted a sizable following.



EVERYBODY IS A DJ: Shoutcast lets you listen to or broadcast your own streaming audio choices, using the Winamp player.





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

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- Microsoft\* Windows\* 98, Second Edition
- 3-Yr Next-Business-Day On-site Service3

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- Integrated NIC/SCSI Controllers; 24X Max CD-ROM
- Dell™ OpenManage™ Server Management Solutions
- 3-Yr NBD On-site Service\*: 7x24 Phone Support

BUSINESS LEASE: \$105/MO., 48 MOS."



■ Single-channel RAID with 64MB Cache, add \$299

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replayty some televisions have all the fun.

# SpinCity

DVD-ROM drives are getting faster and cheaper. But will they ever do more than just play movies? BY JON L. JACOBI

### That old CD-ROM drive in

your computer may soon look as antiquated as a 5.25-inch floppy drive: Just as the old flexy floppy disappeared when faster, higher-capacity 3.5inch disks caught on, a poten-

has already spun into view.

DVD-ROM drives have fallen in price and soared in performance over the past year. But they may offer more speed than you'll ever need.

DVD-ROM's biggest appeal is its capacity: While a typical CD-ROM holds 650MB, a standard DVD holds 4.7GB. That's why DVDs can accommodate the overwhelming data mass of a full-length Hollywood film. As a result, DVD-Video players and DVD-ROM drives deliver images with clarity and de-

PHOTOGRAPHS: GEOFFREY NELSON



### **Best** Buys



WE TAPPED the CenDyne CDI CD 00042 (on top at left) as our Best Buy among DVD-ROM drives. Though not the fastest unit we tested, it offers quick enough performance to support the most common uses of DVD technology, and it balances that with useful features and an attrac-

tive \$147 price. Our Best Buy DVD-RAM drive, Creative Labs' PC-DVD RAM 5.2GB, carries a surprisingly low price tag of \$300. Though it's slower than some other drives on certain tests, it costs only about half as much.

tail far surpassing a VCR's output, making the discs a threat to videotape movies (see "DVD on Your TV," page 148).

The DVD spec also lets you include extras that videotape can't, like subtitles in up to 32 languages and full soundtracks in up to 8. DVD-ROM is fast, too-so fast that it demands a new unit of measure. CD-ROM drive speeds are expressed as multiples of that format's original data transfer rate "X," which equals 150KB per second. So a 17X-40X CD-ROM drive reads data at a minimum 2.6 MBps (17 × 150 KBps) to a maximum 6 MBps (40 × 150 KBps). In the case of DVDs, however, X equals a blistering 1.38 MBps. So today's fastest DVD-ROM drives, rated at 16X, should (in theory) read at 16 x 1.38 MBps-22 MBps.

Though big and swaggering, this younger technology does respect its optical elders. Today's DVD-ROM drives read all CD formats as fast as most CD-ROM drives can. That's a good thing.

### THE SULTANS OF SPIN

	Spatistical Processing					F	eatures compar	ison		
	DVD-ROM or DVD-RAM DRIVE	Street price (4/21/00)	DVD-ROM read speed	DVD-RAM write speed	CD-ROM read speed	Kit ²	Type and interface	Hardware decoder card included?	Performance	Features
N	CenDyne CDI CD 00042 714/979-7367 www.cendyne.com	\$147	3.3X-8X	-	17X-40X	•	Internal, IDE	0	Good	Good
	Hitachi GD-5000 800/448-2244 www.hitachi.com/storage	\$95	3.3X-8X	- 1	17X-40X	0	Internal, IDE	0	Good	Satisfactory
	Panasonic SR-8585-B 800/742-8086 www.panasonic.com	\$125	8X	-	8X-40X	0	Internal, IDE	0	Good	Good
	IBM 8X Max Internal DVD-ROM 800/426-7255 www.ibm.com/options	\$169	3.5X-8X	-	17X-40X	•	Internal, IDE	0	Very good	Very good
MOM	Pioneer DVD-115 800/444-6784 www.pioneerusa.com	\$160	6.6X-16X	-	17X-40X	0	Internal, IDE	0	Excellent	Limited
DVD-	Creative Labs PC-DVD Encore 8X 800/998-5227 www.creative.com	\$250	3.3X-8X	-	17.2X-40X	•	Internal, IDE	•	Very good	Very good
	Utobia DVD-Motion 800/486-0008 www.utobiadvd.com	\$190	4X-10X	-	17X-40X	•	Internal, IDE	0	Very good	Satisfactory
	AOpen DVD-1040 Pro 888/852-6736 www.aopenusa.com	\$167	4.1X-10X	-	16X-40X	•	Internal, IDE	0	Good	Satisfactory
	Hi-Val HDVD10AS-00R1 714/953-0598 www.hival.com	\$260	2X-10X	-	17X-40X	•	Internal, IDE	0	Very good	Good
	Toshiba SD-M1402 949/457-0777 www.toshiba.com	\$260	5X-12X	11-11	17X-40X	•	Internal, IDE	•	Very good	Satisfactory
	Creative Labs PC-DVD RAM 5.2GB 800/998-5227 www.creative.com	\$300	2X	ıx	6.6X-16X	•	Internal, SCSI-2	0	Good	Good
I,	Hitachi GF-1000 800/448-2244 www.hitachi.com/storage	\$400	2X	1X	8X-20X	0	Internal, IDE	0	Very good	Very good
DVD-RAM	QPS Que DVD-RAM 800/559-4777 www.qps-inc.com	\$689	2X	1.4X	12X-24X	•	External, SCSI-2	0	Very good	Very good
٥	Panasonic DVD-RAM LF-D102U 800/726-2797 www.panasonic.com/storage	\$699	2X	ıx	9x-20x	•	External, SCSI-2	0	Excellent	Excellent
	Pinnacle Micro Flex Cinema PC DVD-RAM 800/553-7070 www.pinnaclemicro.com	\$699	2X	11	8X	•	External, SCSI-2	•	Good	Good



• Yes O No

Listed in order by overall value. For DVD-ROM drives, the weightings were: price, 30 percent; performance, 30 percent; features, 15 percent; installation, 10 percent; documentation, 5 percent; tech support, 10 percent. For DVD-RAM drives, the weightings were: price, 25 percent; performance, 35 percent; features, 20 percent; installation, 10 percent; documentation, 5 percent; support quality, 5 percent.

too, because few applications currently come on DVD-and nearly all of them are available on CD-ROM as well. According to Jim Taylor, author of DVD Demystified, there are only about 70 DVD software offerings, versus approximately 6500 film titles in that format.

### WHAT'S IT GOOD FOR?

FOR MOST PEOPLE, there simply are no compelling reasons to abandon the old CD-ROM format, which plays in far more systems than DVD. And since DVD-ROM drives can read CD-ROMs, most companies avoid the extra expense of pressing products in both formats.

According to Microsoft Office product manager David Jaffe, "at this current time, given the broad usage of the product, the media it makes the most sense to deliver is CD-ROM." Likewise, Microsoft has no plans to release its Windows operating system on DVD. Meanwhile, sales of CD-Rewritable drives have skyrocketed in the past year (see "Hello, Get Me Rewrite!" www.pcworld.com/ maroo/cd-rw), giving a further boost to the CD-ROM format.

Though storage capacity is DVD's strength, the technology often loses out even in applications where storage is an issue. Most software vendors would rather put their product on multiple CDs if necessary than switch to DVD format. And many huge-database applications envisioned for DVD-ROM, like mapping software and national phone directories, have instead found homes on the Web.

Some useful titles have made the leap to DVD-ROM, however. DeLorme Soft-



ware delivers its acclaimed Topo USA 2.0, XMap Business, and Eartha Global Explorer map and geography applications on both DVD and CD-ROM. The DVD edition of The Complete National Geographic (a compilation of every page of every issue of the magazine ever printed) occupies only 4 discs, whereas the CD-ROM version requires 31 discs. And Interplay Software offers many of its larger games, like Klingon Academy,

		Service and support							
Installation	Documentation	Tech support quality	Tech support hours/days, charge, toll	Comments					
Good	Satisfactory	Very good	9/M-F, no charge, toll-free	WinDVD 2000 software decoder; uses 0EM Hitachi GD-5000; noisy tray mechanism; 1-year parts/labor warranty.					
Good	Poor <sup>3</sup>	Very good	9/M-F, no charge, toll-free	No software included; OEM unit.					
Good	Poor <sup>3</sup>	Excellent	15/M-F, no charge,* toll-free	No software included; OEM unit; 1-year parts/labor warranty.					
Good	Poor 1	Satisfactory	24/7, no charge, toll-free	InterVideo 5.1 software player; OEM kit; 1-year parts-only warranty (3 years for drives installed in IBM systems).					
Good	Poor 1	Good	24/7, no charge, toll-free	No software included; OEM unit, no digital audio-out; 1-year parts/labor warranty.					
Good	Very good	Good	14/M-Sa, 12-8/Su, no charge, toli call	Creative PC-DVD Player software; includes National Geographic The '90s on DVD-ROM; I-year parts/labor warranty.					
Good	Good	Satisfactory	24/7, no charge, toll-free	Realmagic DVD Station software for decoder card; uses OEM Pioneer DVD-104S; lacks emergency-eject mechanism; 1-year parts/labor warranty.					
Good	Satisfactory	Very good	8/M-F, no charge, toll call	WinDVD software decoder; lacks emergency-eject mechanism; 1-year parts/labor warranty.					
Good	Good	Poor s	9/M-F, no charge, toli call	Realmagic DVD MPEG-2 software for decoder card; 1-year parts/labor warranty.					
Good	Good	Satisfactory	11/M-F, no charge, toll call	Realmagic DVD Station software provided with decoder card; OEM kit, lacks volume control or headphone jack; 1-year parts/labor warranty.					
Satisfactory	Very good	Good	14/M-Sa, 8/Sun, no charge, toll call	Software includes WriteDVD and Format UDF; no player software; no digital output; no volume control or headphone jack; 1-year parts/labor warranty.					
Good	Poor <sup>1</sup>	Very good	9/M-F, no charge, toll-free	Comes with Software Architects WriteDVD; no player software; DEM unit; no digital output; 1-year parts/labor warranty,					
Satisfactory	Very good	Very good	8/M-F, no charge, toll call	Software includes WriteDVD and DVD-RAM Tune Up (for Macintosh); no player software; OEM Hitachi GF-1050. Comes with SCSI cable and terminator. Stereo RCA jacks but no digital audio-out; 1-year parts/labor warranty.					
Satisfactory	Good	Excellent	8/M-F, no charge, toll call	Software includes device driver, MPEGI Coder, FileSafe (backup), MediaSafe (disk copy), DVD Agent utility; drive enclosure provides no digital audio-out; analog audio-out is via a mini-stereo Jack on the back; I-year parts/labor warranty.					
Satisfactory	Very good	Poor	10/M-F, no charge, toll-free	WriteDVD, Realmagic Hollywood Plus software for decoder card; uses OEM Hitachi GF-1050. Comes with SCSI cable and terminator. Provides stereo RCA jacks but no digital audio-out; 1-year parts/labor warranty.					

We define a kit as a drive that comes with everything you need for installation, such as cables and mounting hardware.

Bare drive: Little or no documentation included.

<sup>\*</sup> First year only.

Technical support was very difficult to contact and slow to respond.

in DVD format. The advantage is convenience: With DVD, you have fewer discs to juggle (and misplace).

### GENERATING SPIN

THOUGH THE BENEFITS of DVD remain primarily theoretical, consumers and vendors are hedging their bets for the future and adopting the technology. After a tepid 1999, sales of DVD-ROM drives have warmed up and are expected to surpass CD-ROM drive sales by 2001, according to predictions by International Data Corporation. And because the latest DVD-ROM drives are faster, more versatile at reading various media, and less expensive than their predecessors, they now come standard on many desktop and notebook systems.

We tested ten DVD-ROM drives for this review-AOpen's \$167 DVD-1040 Pro, CenDyne's \$147 CDI CD 00042. Creative Labs' \$250 PC-DVD Encore 8X, Hitachi's \$95 GD-5000, Hi-Val's \$260 HDVD10AS-00R1, IBM's \$169 8X Max Internal DVD-ROM, Panasonic's \$125 SR-8585-B, Pioneer's \$160 DVD-115, Toshiba's \$260 SD-M1402, and Utobia's \$190 DVD-Motion. All are rated

to read CD-ROMs at a maximum speed of 40X. And unlike first-generation DVD-ROM drives, they can read CD-R and CD-RW discs with aplomb.

Our Best Buy DVD-ROM drive is Cen-Dyne's CDI CD 00042. Though it did not take top honors in any individual test or category, this 8X DVD/40X CD-ROM drive offers the best overall mix of affordability, performance, features, and support. The least-expensive drive in our review, Hitachi's 8X/40X GD-5000. comes in second mainly because it is a bare-bones unit with limited features and documentation. Hitachi concentrates on selling the GD-5000 to

other vendors, which repackage it

**DVD-RAM: LARGE** 

265.54

252.52

for consumers.

TEST REPORT

### DVD Overdrive

Top speed but not top value: Pioneer outruns ROM rivals, QPS writes fastest.

			CD-ROM	read speed	DVD-ROM speed	AND LOOMING			
	DVD-ROM or DVD-RAM Drive <sup>1</sup>	Corel Professional Photo search	100MB 100MB file copy (inside) (outside)		Microsoft Office 2000 install	Eartha Global Explorer DVD search	in addition to exam		
	CenDyne CDI CD 00042*	57.26	42.98	23.36	247.85	171.51	ucts, we looked at first-generation D RAM drives, the re		
	Hitachi GD-5000	55.99	43.97	23.65	254.68	172.40			
	Panasonic SR-8585-B	59.49	37.13	34.96	298.83	161.32	able kin of DVD-ROM		
	IBM 8X Max Internal DVD-ROM	55.89	37.20	23.37	245.85	169,91	(A competing sta DVD+RW, has the		
<b>JD-ROM DRIVE</b>	Pioneer DVD-115	55.18	32.32	23.42	229.04	141.96	failed to materialize; th		
	Creative Labs PC-DVD Encore 8X	61.63	34.42	22.62	267.46	161.57	prospect of a stand war initially hind		
0	Utobia DVD-Motion	57.07	34.18	22.18	275.52	142.48	growth in the writab DVD market, but DV RAM now rules the		
	AOpen DVD-1040 Pro	56.88	38.44	37.16	282.14	144.22			
	Hi-Val HDVD10AS-00RI	56.87	33.95	22.47	290.36	141.96			
	Toshiba SD-M1402	53.39	35.17	22.28	288.03	154.45	DVD-RAM speed Write 100MB Rewrite 100	MR	
100	Creative Labs PC-DVD RAM 5.2GB*	61.64	130.61	70.17	374.42	196.98	235.51 262.51	_	
WE	Hitachi GF-1000	65.11	66.11	35.06	346.11	163.16	250.34 261.66	4.	
DVD-RAM DRI	QPS Que DVD-RAM	91.64	85.72	85.89	522.88	165.50	148.91 2 167.46 2		
	Panasonic DVD-RAM LF-D102U	72.43	65.10	36.46	315.50	144.37	198.45 207.23		

\*Best Buy

1 8 THOW WE TEST We installed all drives in a Quantex Pentium II-350 system with 64MB of RAM and an 8.4GB hard drive. Drives with an IDE Interface were set as master on the secondary IDE channel. We gauged CD-ROM read performance using four timed tests: 100MB file copy from the inner tracks of a CD to the hard drive, 00MB file copy from the outer tracks of a CD to the hard drive, sequential display of a slide show from Corel Professional Photo, and installation of Microsoft Office

86.39

614.89

All times are in seconds; smaller is better

165.16

2000. We also measured the search time of a preplanned trip from Eartha Global Explorer DVD-ROM mapping software. Overall DVD-ROM speed rankings were determined by weighting each of the CD read tests at 17.5 percent and the DVD read test at 30 percent. For DVD-RAM drives, we performed all read tests and also measured the times required to write and rewrite a 100MB file to a DVD-RAM disc. The overall DVD-RAM score was determined by weighting the write speed at 40 percent and the rewrite speed at 60 percent. To determine the ranking of DVD-RAM drives, we weighted the overall write score at 80 percent and the read score at 20 percent. Listed in order by overall value. 2 Write and rewrite times for the QPS Que were measured with write verification disabled per the vendor's specifications. All other DVD-RAM drives were tested with verification enabled.

85.36

91,44

Pinnacle Micro Flex Cinema PC DVD-RAM

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field.) DVD-RAM drives can read DVD-ROM, CD-ROM, CD-R, and CD-RW discs, and they write to their own proprietary 2.6GB-per-side discs. A doublesided (5.2GB) DVD-RAM disc can hold as much data as six or seven CD-ROMs.

Nevertheless, beware of inflated performance claims. Manufacturers advertise a 1X (1.38 MBps) transfer rate, but our testing shows that drives generally write at approximately a third of their claimed speed. This is due in part to a function known as write verification: Unlike CD-RW units, a typical DVD-RAM drive checks every bit of copied data against the original file to ensure that the information has been faithfully reproduced. As a result, the TOSHIBA'S SD-M1402 DVD-ROM

Interestingly, the QPS Que drive ships with verification disabled, helping it post faster write times than all the other drives we tested, which had verification enabled by default. QPS representatives claim that verification is unnecessary, but Panasonic and other vendors we asked disagree. They point out that the exposure to outside elements can damage the media, and they fear that the budding technology's credibility could be harmed if customers doubt its reliability. Our take: If you plan to use DVD-RAM to store critical data, write verification will ensure that your files are faithfully recorded.

verifying data integrity.

First-generation DVD-RAM drives read discs relatively slowly, in part because the laser must both read and write-sacrificing optimum read performance for versatility. These drives move data from DVDs at 1.38 or 2.8 MBps (1X or 2X, expressed as a DVD X rating), and from CD-ROMs at relatively poky transfer speeds of 2.4 or 3.6 MBps (16X or 24X, in CD-ROM's X rating parlance).

Media compatibility is one problem : with DVD-RAM. The discs come packaged in protective cartridges called Type 1 or Type 2. The Type 1 cartridgeswhich include all double-sided, 5.2GB discs-are sealed and work in DVD-RAM drives only. Type 2 cartridges are more flexible: You can take out the single-sided, 2.6GB disc and run it in a compatible DVD-ROM drive. Unfortu-

drive spends half the write cycle drive (top) and SD-1200 DVD-Video player.

DVD on Your TV

THOUGH DVD-VIDEO MOVIES can look great on a high-quality computer monitor, you might long to watch them from something more comfy than a desk chair. So why not use your computer-or a stand-alone DVD-Video player-to send signals to your television? With its lower resolution, a TV screen won't usually produce as sharp a picture as a computer monitor, but its larger size will let you sit back and enjoy the show.

A stand-alone player is easy to connect to a TV. But hooking up your computer can be trickier. If your graphics card doesn't already provide TV output, a \$50 to \$100 hardware decoder is the simplest solution. The cards bundled with our review drives provided composite and S-Video output, plus Dolby Digital and analog audio output for a stereo or home theater system.

### **GETTING HITCHED**

ARE THE HOOKUP HASSLES worth it? To find out, we sent signals to a 27-inch TV from two hardware decoder cards (Sigma Designs' \$68 Realmagic Hollywood Plus and Creative Labs' \$80 Dxr3): from two software decoders (Cyberlink's \$50 PowerDVD 2.55 and InterVideo's \$30 WinDVD 2000, using a Matrox Marvel G400-TV card for TV output); and from a stand-alone \$399 Toshiba SD-1200 DVD player. After tweaking brightness and contrast, we could scarcely distinguish between drives with software or hardware decoding and the stand-alone player.

In the end, though, we kicked back on the couch with the Toshiba stand-alone player and its remote control-a passive tool for passive entertainment. If your computer is already located near the TV, by all means employ it as a DVD player. Otherwise, the convenience, portability, and easy installation of a standalone player make it your best bet.

nately, of the DVD-ROM drives we reviewed, only the Hitachi and the Cen-Dyne (which uses a Hitachi mechanism) had the capacity to read Type 2 discs.

Power users who intend to install DVD-RAM and CD-RW drives may run into difficulties. Adaptec's Easy CD Creator 4.0x, DirectCD 2.5, and DirectCD 3 behaved erratically on systems that had Write DVD installed as well. An Adaptec representative told us that the company is working on the problem.

> Another drawback of DVD-RAM is the price: Four of the five drives we tested cost at least \$400: Hitachi's \$400 GF-1000, Panasonic's \$699 DVD-RAM LF-D102U, Pinnacle's \$699 Micro Flex Cinema PC DVD-RAM kit, and QPS's

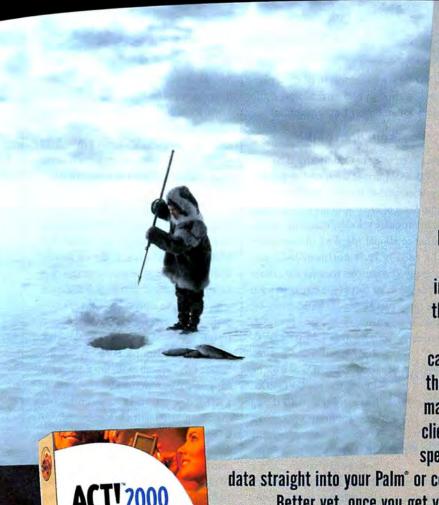
\$689 Que DVD-RAM. The lone exception: Creative Labs' PC-DVD RAM 5.2GB, which costs only \$300 and captured our Best Buy.

DVD-RAM technology is developing quickly, however. By this July or August, manufacturers expect to ship backwardcompatible, second-generation DVD-RAM drives, priced at around \$700, that will double their predecessors' performance-writing at speeds of 2X to faster discs that hold 4.7GB per side. Unfortunately, the current batch of DVD-ROM and 1X-DVD RAM drives cannot read the new media.

### IN-DRIVE MOVIE

DVD-VIDEO movies are stored on discs in MPEG-2 format, with a built-in compression scheme that retains high visual quality but still demands relatively large files. To play a DVD film, your DVD-ROM drive needs to have either a software MPEG-2 decoder or an expansion card that includes an MPEG-2 decoder chip. The Toshiba SD-M1402 and Utobia DVD-Motion DVD-ROM

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drives, along with the Pinnacle Micro Flex Cinema PC DVD-RAM drive, offer versions of Sigma Designs' Realmagic Hollywood Plus card (www.sigmadesigns.com). Creative Labs' PC-DVD Encore 8X comes equipped with Creative's own proprietary Dxr3 card.

MPEG-2 decoder cards take over rendering duties from the CPU, helping movies play more smoothly on slower (under 350-MHz) systems, especially if you're working simultaneously in other applications. Try that using a processortaxing software decoder, and you may encounter choppy playback. De-

coder cards also provide audio and video output jacks for your stereo and television. The Holly-

wood Plus and Dxr3 cards supply outputs for analog stereo, S/PDIF digital audio (for Dolby Digital receivers), composite video and S-Video.

Software MPEG-2 decoders such as CyberLink's PowerDVD 2.55 (www. cyberlink-usa.com) and InterVideo's WinDVD 2000 (www.intervideo.com) rendered movies on our 400-MHz Celeron test system as successfully as their hardware counterparts did, without tying up a card slot or an IRQ number.

Read speed isn't critical to DVD movie playback. Films are recorded to play at 1X, and the drives we tested can read at much higher rates. The speed potential of these drives (up to 16X for the Pioneer

Though the **benefits of DVD** remain **primarily theoretical**, consumers and vendors are hedging their bets for the future and **adopting the technology**.



DVD-115) is irrelevant to normal playback, although higher read speeds do allow for smoother fast-forwarding.

### SPIN DOCTORING

THE ACTUAL SPEED attained by the DVD-ROM drives we tested depended on what part of the disc they were reading. Most of them spin the disc at a constant angular velocity, maintaining the same rotational speed no matter where the read head is positioned. Consequently, these drives transfer data faster from the outer part of the disc than from the inner part (most CD-ROM drives are CAV mechanisms, too). Many manufacturers list only the unit's swiftest DVD-

ROM speed. The Panasonic SR-8585-B was unique among the ten DVD-ROM units we tested in using constant linear velocity, an arrangement in which the drive varies the disc's rotation speed according to the

position of the read head, so the device maintains a constant data transfer rate.

We ran several tests to gauge the realworld performance of the drives in this review. Since people often use DVD-ROM drives to play CD-ROMs, we examined how the drives handled several relevant tasks: copying a file from inside and outside portions of a CD, installing Microsoft Office 2000, and displaying a slide show on Corel Professional Photo. We also tested DVD-ROM performance by measuring how long the drives took to map a trip using DeLorme's Eartha Global Explorer. We ran the same five read tests on the DVD-RAM drives, and we also measured the time each drive took to write and rewrite a 100MB file.

### THE X-PHILES

IT'S COOL TO OWN the newest, fastest, most powerful device on the market. But how much does state of the art matter with DVD? Our read tests revealed that as with CD-ROM drives, DVD drives with larger X-ratings don't always outperform the competition. Rated at a maximum speed of 16X DVD-ROM/40X CD-ROM, the Pioneer DVD-115 was the fastest drive overall, with top finishes in copying a file from the inside portion of a CD-R disc (just over 32 seconds) and installing Microsoft Office 2000 from CD-ROM (a scant 3 minutes 49 seconds-17 seconds faster than its nearest competitor). The DVD-115 also completed our DeLorme Eartha Global Explorer DVD-ROM test in a scorching 2 minutes 22 seconds, though the 10X-rated Hi-Val drive was just as fast in that test.

Among DVD-RAM drives, the 2X/20X-rated Panasonic LF-D102U and the 2X/20X-rated Hitachi GF-1000 traded first- and second-place finishes in our two file copy tests. The Panasonic took 65 seconds to copy 100MB from the inside track of a CD and 36.5 seconds





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from the outside track. The Hitachi's ! times were 66 seconds and 35 seconds for inside and outside reads. The same units also shared top honors in the Microsoft Office 2000 install (5 minutes 16 seconds for the Panasonic and 5 minutes 46 seconds for the Hitachi). At the

other extreme, the Pinnacle and QPS drives posted slow Microsoft Office 2000 install times of 10 minutes 15 seconds and 8 minutes 43 seconds, respectively. The Creative Labs PC-DVD RAM 5.2GB was swiftest at displaying a Corel Professional Photo slide show, finishing in less than 62 seconds-almost 4 seconds better than the Hitachi and almost 11 seconds ahead of the

Panasonic. But the latter two returned to the top on our DeLorme Eartha Global Explorer test, with times of 2 minutes 24 seconds for the Panasonic and 2 minutes

43 seconds for the Hitachi.

Most of the drives turned in similar DVD-RAM write performance. The exception was the QPS Que DVD-RAM. It wrote our 100MB test folder in only 2 minutes 29 seconds, while Pinnacle's Micro Flex Cinema PC DVD-RAM took a whopping 4 minutes 13 seconds-that's 672 KBps to only 395 KBps. But as noted earlier, the Que is the only drive we reviewed that came with write verification disabled. When we switched verification on, the QPS performed approximately the same as the other driveswriting a 100MB file in 4 minutes and 15 seconds.

### CREATURE COMFORTS

ALL OF THE DVD-ROM drives we tested are solidly built devices with IDE interfaces. but we saw some notable differences in their features. For example, the AOpen DVD-1040 Pro and the Utobia DVD-Motion are both slot-fed drives.

which gently pull in the discs when you insert them. We liked the servo-operated slot feeds, with their disc-cleaning pads, and admired the drives' ability to operate in any orientation. We missed the emergency eject machinery (basically a small hole into which you can poke a

> straightened paper clip or similar object to eject the disc in case of drive failure) that most trayloading drives provide, however. All of the eight other

THE PORT-Noteworthy

### DVD-ROM drive.

### **DVD** for Notebooks

THE IN-FLIGHT MOVIE has never been a grand cinematic experience. A typical offering is a small screen five rows distant, with sound piped through hollow tubes. And you're stuck watching whatever movie the airline got a good deal on. The remedy for frequent fliers: Watch movies on your notebook computer.

If your notebook lacks a built-in DVD-ROM drive-and the manufacturer doesn't offer one-you'll need an external model. We tested three drives with easy-to-install PC Card interfaces: the \$379 Addonics 4X/24X PocketDVD (www.addonics.com), the \$335 EXP 2X/16X DVD Traveler (www.expnet.com), and the \$399 Port-NoteWorthy Slimline 4X/24X (www.port.com). The Port-Noteworthy and Addonics drives played movies smoothly, but the EXP dropped almost as many frames as it rendered on our IBM ThinkPad I Series 1480; the company's tech support personnel could offer no solution. We also tried EXP's \$549 DVD Traveler Plus-which comes standard with a Margi PC Card hardware MPEG-2 decoder-and obtained fine results.

### A NOTEWORTHY CHOICE

THE PORT-NOTEWORTHY, our favorite drive, comes with a coupon for a MediaMatics software decoder. When you order the decoder, you may want to get a backup notebook battery, too, because playing DVD movies on any external drive drains power quickly. Mileage varies by notebook, but our ThinkPad's 4-hour run time dropped to 1.5 hours in DVD play. Still, if you spend much time in the air, DVD movies may be worth the investment.

DVD-ROM drives in this roundup use tray mechanisms with emergency eject.

Two other basic features on almost every DVD-ROM drive are a volume control and a mini-stereo headphone jack. Alas, both are absent from the Creative Labs PC-DVD RAM 5.2GB, the Panasonic DVD-RAM LF-102U, and Toshiba SD-M1402 DVD-ROM. And surprisingly, the newest DVD-ROM drive-Pioneer's DVD-115-omits the digital output that other drives use to send direct signals to the computer's sound card or to a set of digital speakers.

An important distinction among the DVD-RAM drives is how they connect to your computer. Three (Panasonic's DVD-RAM LF-D102U, Pinnacle's Micro Flex Cinema PC DVD-RAM, and QPS's Que DVD-RAM) are external SCSI units. Creative Labs' PC-DVD RAM

> 5.2GB uses an internal SCSI connection, and the Hitachi GF-1000 connects via an IDE interface. (Only the QPS kit supplies a SCSI card.) The best drive for you may depend on how much space you have inside your PC-or next to it.

### SPINNING INTO THE FUTURE

CENDYNE'S CDI CD 00042 is our top overall pick among DVD-ROM drives, although every model we reviewed has the speed and features to satisfy you for years to come. On the DVD-RAM front, Creative Labs' \$300 PC-DVD RAM is a bargain among first-generation drives. But if you crave speedand are willing to pay for ityou may do better to save your money for the coming secondgeneration DVD-RAM drives.

San Francisco-based freelance writer Jon L. Jacobi contributes regularly to PC World. Elliott Kirschling and John Tjon, PC World Test Center performance analysts, conducted all performance tests.

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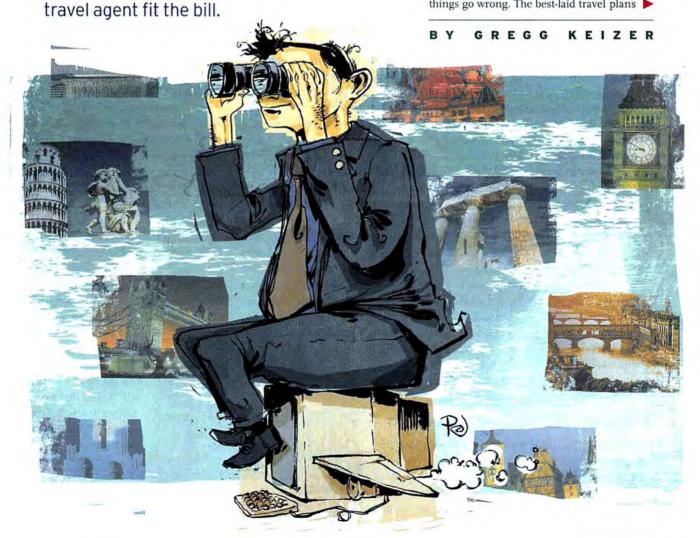
lurched in the overhead compartment while passengers gripped their handrests. Even the off-duty

Our reporter booked two trips online-from researching destinations to buying tickets.

The cost savings were real, but sometimes a

airline pilot next to me grew wild-eyed. And all I could think was. What moron booked this flight? Oops. That moron was me.

This was the first time I'd skipped a travel agent and booked my own trip over the Web. Like the 9 million other households that booked their travel online in 1999, I love the idea of Web travel planning, which brings the world's offerings to your fingertips. Nothing beats the convenience of the Net's 24-hour reservations desk or the sense of complete control that booking online gives you. Unfortunately, there's no one to blame when things go wrong. The best-laid travel plans



## The Web is great for finding cheap fares that an agent may not know about or have access to. often go awry. And no one—not even the Internet—can predict turbulence. But while you can't control everything about your trip, there are things you can do to The Web is great for finding cheap fares that for finding cheap fares that an agent may not know about or have access to. I start with Rough Guides to Travel Online (travel.roughguides.com), which covers an astounding 14,000 locales, from Ho Chi Minh City to Iowa City. The de-The Web is great for finding cheap fares

your trip, there are things you can do to make online travel planning smoother and more successful.

### Taking Off

WITH THE NUMBER OF Internet travel sites and services increasing each year, it's tough to know which sites offer the best deals and the most useful features. So we've done a bit of the legwork for you. We've whittled down the list of URLs to the best sites for booking flights and hotels, and we've uncovered the most helpful spots for researching a destination and planning your sightseeing. But how does booking travel over the Web compare to what an agent can do for you?

To test the Web's travel capabilities, I offered to go online to book travel plans for two PC World editors. One needed to get to Providence, Rhode Island, for her 30th college reunion; the other was heading with his wife to Spain for a friend's wedding, after a stopover in London to visit his inlaws. At the same time, I asked my own agent, Laurie Nibblett, to find the best deal her way. Laurie works for a small agency in Eugene, Oregon, and has been booking trips for me since 1991. To even the playing field, we researched fares the same day.

But this wasn't just a my-fare-beatsyour-fare bragging game. With all the travel planning sites on the Web these days, the Internet has put the fear of God-or at least the fear of your browser-into traditional travel agents. The number of travel agencies in the U.S. has gone down by Web was truly ready to replace a real travel agent in every task-from researching a destination and planning an itinerary to booking airfare, car, and hotel.

My verdict? The Web certainly can compete with a live agent in most areas, with a few caveats. The Web is great for finding cheap fares that an agent may not know about or have access to, or for planning sightseeing tours and other activities. But you should never depend on just one site for all your travel planning (at the very least you'll want to shop around to compare prices), and there are still times when you'll want to call on an agent instead of your browser. Booking international travel and other complicated itineraries online, for instance, sucked more hours out of my life than a visit to the DMV.

But there's no question the Net can do many things better-and more cheaplythan an agent.

### **Destination** Unknown

MOST OF THE TIME I know exactly where I'm going (travelwise, that is; if you're talking "life direction," I'm clueless). Whether it's a business trip or midwinter escape from the water-logged Northwest, my end point is usually set before I step up to the PC. But sometimes I don't know which locale suits my mood (or budget). Agents can recommend destinations, of course, but with travel sites bulking up their content, it's now

easy to find travel ideas on the Web.

Ho Chi Minh City to Iowa City. The descriptions are concise, and I get an overview of locales by skimming the intros, then drilling down to meatier topics, like the best things to see and do.

When I just want to get away on a budget, I use Travelocity's Dream Map feature-a hoot to explore. Simply enter a departure city (in the U.S. or Canada only) and the amount of money you can blow on round-trip airfare, and Dream Map will list all the cities you can reach for that amount or less, at that day's fares. I typed in Eugene, Oregon and \$300, and Dream Map came back with 16 destinations, from Seattle to Cleveland. Hmmm...I've always wanted to see the Rock and Roll Hall of Fame.

### Fare Fight

MY TWO TRAVEL-HAPPY EDITORS, however, knew exactly where they wanted to go, so I focused on booking their flights. Off I went on my surfing spree, while Laurie tackled the challenge from her end.

I knew the domestic trip would be a breeze; the Web excels at helping you book straightforward, A-to-B trips. But I was leery of the overseas itinerary. The more complex your travel plans are, the more time it will take you to sniff out a good deal. That's the biggest drawback of do-it-yourself booking: You can get so involved in hunting the lowest fare that you end up burning hours like an Inter-

net start-up burns money.

To save time, I stuck with the two travel portals ranked highest by Gomez Research, Expedia and Travelocity, as well as three others: Lowestfare.com and CheapTickets.com (both discounters), plus Trip.com (a

travel portal that has

### www.unclaimedbaggage.com

WE STILL DON'T KNOW where lost socks go when they disappear from the dryer, but at least now we know where lost luggage ends up; but who would have thought it would be Alabama? Unclaimedbaggage.com sells everything from clothes to cameras-all booty from unclaimed or lost airline baggage-out of its warehouse in Scottsboro.

extras like IntelliTrip, which lets me search the Web sites of 13 airlines in one click). Scads of other sites are out there, but I've found that if I use more than a few, I end up blowing too many hours chasing too-puny discounts.

To bargain-hunt on Expedia or Travelocity, I use their instant pric-

ing tools: Expedia's Quick Roundtrip Flight Search and Travelocity's Best Fare Finder. (PreviewTravel, another top site, recently merged with Travelocity, which will probably have absorbed Preview's offerings by the time you read this.) These tools are easy to find and don't require a user name or password to do the quick searches. Of the two, I prefer Travelocity's Best Fare Finder. It doesn't make you enter departure and return dates, and it often suggests an alternate arrival airport



BEEN WONDERING where you can find a juggling festival or the next Tulipmania flower festival? Click on the world map at Festivals.com to see what events are taking place when.

to cut your cost. In contrast, Expedia makes you specify dates and approximate

desired travel times before showing you itineraries or prices.

The first PC World editor, heading for her reunion on Memorial Day weekend, was flexible about her departure-I could send her out on a Tuesday or Wednesday, when fares are cheaper. She was also willing to use alternate airports to get a better rate-to leave from Oakland instead of San Francisco, and to arrive at Boston instead of Providence. And she had a Saturday night stayover, which always reduces the price of a ticket. (For other ways to finesse the lowest fares, check out "Tips for Bargain Flying" on page 164.)

Once you've used Best Fare Finder or Quick Roundtrip Flight Search, head to the flight reservation area (only a click or two into either site), where you'll find a slew of other options that the rapid fare finders don't offer, such as the ability to specify airlines (to maximize frequent flier miles), and your preferred time of day for travel. Travelocity scores higher here, too. It presents all the data for each leg of your trip (Expedia makes you click to a different page to see plane changes), and it lists the type of aircraft you'll fly.

### Agent vs. Browser: Knowing When to Pick Up the Phone

THOUGH TRAVEL AGENTS are feeling the squeeze from the Internet, PhoCusWright, an online travel research company. reports that only 3 percent of all travel was purchased online in 1999. While that figure is expected to rise, Laurie Nibblett (right), who works for an agency in Eugene, Oregon, says there are still times when clients should call on her instead of the Internet. Agents, for instance, have ways around airline reservation systems to find discount seats that are technically "sold out." But agents' biggest advantage, Nibblett says, is their knowledge: agents might, say, suggest you book your S.F. flight to Kenya through Amsterdam rather than direct, to save \$1500. "All an airline is going to do is quote you their fare; but they're not going to suggest that [they'll] offer you [a cheaper fare] to change planes." Below are tips to help you know when to use an agent and when to use the Web. ADVANTAGE, WEB: YOU KNOW WHAT YOU WANT. If you've been there before and know the general price of a ticket, booking domestic trips on the Web is the way to go. Booking accommodations at a hotel chain is also easily handled online.

ADVANTAGE, AGENT: YOU WANT BACKUP. You're flying solo when you book on your own, while a good agent can be a strong advocate when things turn sour with a hotel or tour operator.

ADVANTAGE, AGENT: YOU VALUE YOUR TIME. The Web's 24hour convenience is hard to beat, but finding the best deal is time consuming. "You can also do your own taxes, or research your own law case," says Nibblett, "but these all take time."

ADVANTAGE, WEB: YOU LOVE THE HUNT. Part of the fun of using the Web to plan and book your own travel is the control you feel and sense of accomplishment you get when you do manage to track down an unbeatable deal.



### There's no question the Net can do many things better-and more cheaply-than an agent.

### **Bargain** Hunting

AFTER A HALF-HOUR ONLINE, the lowest round-trip fare I found for S.F.-to-Providence on these two sites was \$364 on Continental, with one stop in Newark, New Jersey. Meanwhile, Laurie, my agent, was doing her own keyboard dance and came up with \$384 on US Airways.

Not satisfied with these results, I extended my search, this time playing with departure and destination cities and dates—a real hassle on sites that make you back up to the itinerary form to enter new info, but a breeze on Expedia and Travelocity. I also visited the discount sites, LowestFares.com and CheapTickets.com. (For tips on purchasing travel through online auctions, see "The Price Is Right...Or Is It?" at www.pcworld.com/juloo/travel.)

After another hour, I found a \$319 US Airways fare on CheapTickets.com, flying from San Francisco to Providence on Wednesday and returning on Monday, with a stop in Pittsburgh each way. Only problem was, CheapTickets wouldn't show me a total that included its \$8 fee plus all other charges and taxes unless I entered my credit card number first. That spooked me a bit, since I still wanted to browse before buying, so I moved on.

First, I went to US Airways' own site (www.usairways.com) to look for an equal or better price there. Sometimes airlines offer special Web-only fares to entice travelers to book through their site rather than through a commissioned travel agent, No go. US Airways quoted the price, including fees and taxes, at \$334-\$30 cheaper than Expedia and Travelocity's Continental fare and \$50 cheaper than the US Airways fare that Laurie had found, but still not as low as I wanted. So I pulled out my final trick, Southwest Airlines. I always take a spin through Southwest's site (www.southwest.com) when I'm booking domestic travel. While Southwest doesn't show up on many

portal searches, it often yields the lowest fares. No luck this time, though. The best deal that Southwest could offer was \$384.

After two hours of online research, my advice to the editor heading to Providence was to book the \$334 fare that I'd found on the US Airways site.

When it comes to overseas travel, you'll want to broaden your base of sites to include consolidators—companies that buy blocks of tickets on heavily traveled foreign routes, such as the United Statesto-Europe—as well as deep discounters and lesser-known airlines that the travel portals don't usually include in their databases. That strategy paid off as I booked the second editor's trip.

He wanted to go from San Francisco to London, then to Madrid after eight days, and head home from Madrid after two weeks in Spain. To my agent Laurie, the itinerary seemed simple. Not to me. Multilegged journeys typically carry outrageously high prices on the Web, since online fare finders tend to assemble these

### Sites to Go

THE WEB IS FILLED with travel sites that do more than just help you book airfare. Here are some others to check out.

### ADVENTURE TRAVEL

Adventureseek.com Gorp.com Outsidemag.com

### **DESTINATION RESEARCH**

Travelandleisure.com Travelchannel.com

### **DINING & ENTERTAINMENT**

Citysearch.com Timeout.co.uk Zagat.com

### HEALTH/SAFETY

Cdc.gov/travel Lonelyplanet.com/health/

### HOTELS

Leisureplanet.com Hotelstravel.com Travelbook.com

### TRAVEL LITERATURE

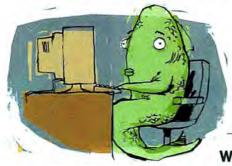
Connectedtraveler.com Exploremag.com Salon.com/travel/index.html

trips by piecing together one-way tickets, which are always more expensive than round-trip fares. Want a shock? Expedia's cheapest fare for the S.F.-London-Madrid-S.F. trip was a whopping \$1795, and Lowestfare.com quoted me \$968. Ouch!

A better method for pricing multileg journeys online is to book a round-trip ticket for each leg. So I combined a San Francisco-to-London round-trip ticket with a London-to-Madrid round-trip ticket on separate airlines (the editor didn't mind returning from London instead of Madrid if it would save money). Within 30 minutes I found a \$580 round-trip fare from S.F. to London on British Airways.

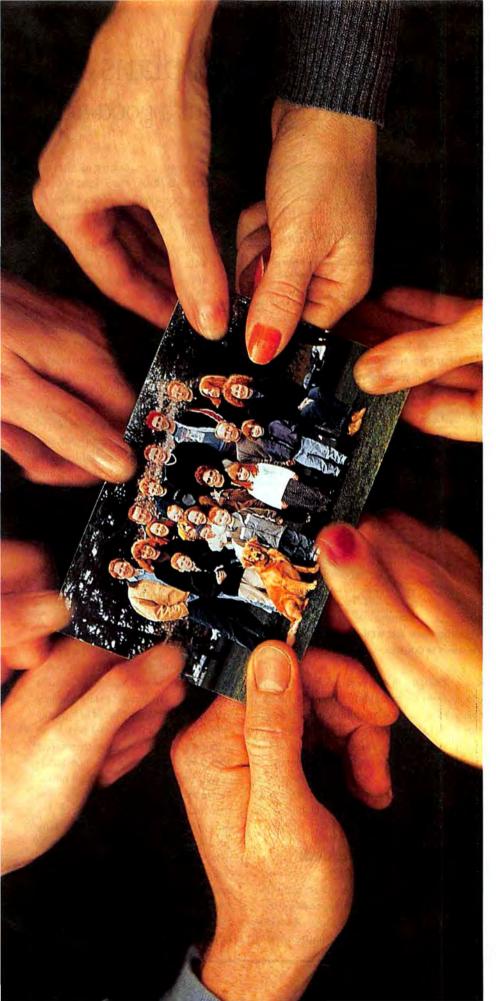
I struck out trying to find a really cheap fare from London to Madrid on the standard airline sites. But at Airlines of the Web's site (flyaow.com/airlines.htm), which lists links to over 500 airlines worldwide, I found two European regional carriers, British Midland and EasyJet, by using my browser's Find feature to search terms like discount and UK.

I priced a London-to-Madrid round-trip ticket with EasyJet at about \$88 (the site lists fares only in pounds, but I converted it using the converter I found at finance. yahoo.com/m3?u). The total? Just \$668—less than the \$968 Lowestfare price



www.sushi.infogate.de

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### The more complex your travel plans are, the more time it will take you to sniff out a good deal.

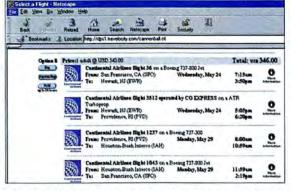
and less than the \$778 fare Laurie dug up in about an hour. But there was a catch: The editor would have to change airports in London, since the EasyJet flight would go to Luton airport, not Heathrow, from which the British Airways flight would depart for S.F. Laurie's booking contained an interesting twist, though: It combined a round-trip United fare of \$622 from S.F. to London, with an Iberian Airlines one-way flight from London to Madrid for \$156. The plus? The United flight let you return from a different city, so the editor could return from Madrid.

I'd never even thought about booking this way. So, armed with my new smarts, I returned to Travelocity and also hit a couple more sites: Council Travel (www. counciltravel.com), formerly a student-only agency that now caters to nonstudents as well; Bestfares (www.bestfares.com), a consolidator that charges \$60 annually for access to its best bargains; and Air-Saver.com (www.airsaver.com), another consolidator. Bestfares from S.F. to Madrid, with stopover

privileges in London. Even with the \$60 fee tossed in, the price was impossible to beat. But Bestfares doesn't let vou book over the Web (you must call to close the deal) and doesn't give you the airline, flight times, or availability until you call.

I returned to Travelocity and found a great \$583 fare on British Airways to London, that allowed a return from Spain. I then filled the London-to-Madrid leg with a \$43 one-way flight on EasyJet, for a total cost of \$626. Not bad for a high-season fare. But I'd squandered nearly 6 hours on the Web! I guess I won't be tossing Laurie's number out of my Rolodex after all.

In the end, the domestic trip was simple and a relative snap to book, even



BOOK 'EM DANNO: Travelocity's Best Fare Finder presents all data for each leg of your trip-even the type of aircraft you'll fly.



POSTCARDS FROM THE WEB: The Rough Guides travel site lets showed me a \$498 round trip you research 14,000 locales, from Ho Chi Minh City to Iowa City.

though I blew 2 hours doing it. I would never hesitate to turn to the Web for planning and booking that kind of itinerary. But the overseas deal ate up two afternoons of surfing. Bottom line? I'll still call Laurie to book complicated itinerariesmultiple stops, trips that involve moving from place to place, that kind of thing. I'll probably pay more in the end, but the savings in time will be worth it.

### Getting Grounded: Hotels and Cars

UNLESS YOU'RE PLANNING to bunk in the airport lounge (for tips on doing so-I kid you not-skim The Budget Traveller's Guide to Sleeping in Airports at www3. sympatico.ca/donna.mcsherry/ airports.htm), you'll want to book transportation and accommodations before you take off for your trip.

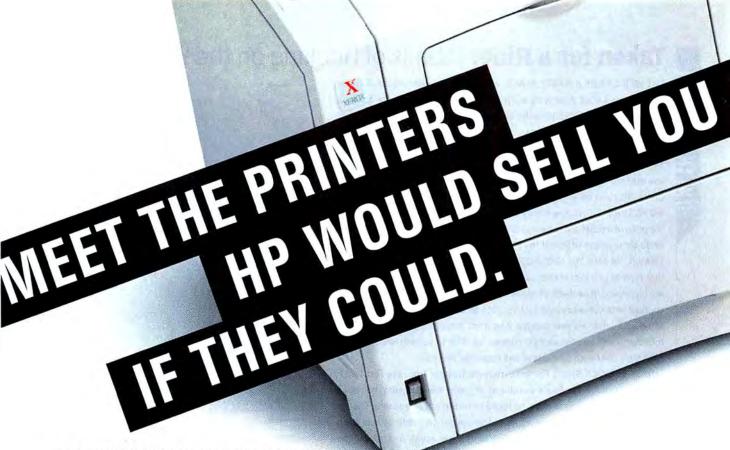
All the big-name sites let you reserve rental cars and a place to lay your head. But convenience aside, it's seldom wise to stick to one site alone for all of your needs. Using a travel portal like Travelocity to reserve a car is fairly straightforward, but you're still better off trying several sites to compare prices.

I priced a rental car for the Providence trip at Travelocity and Expedia. Travelocity listed a weekly rate of \$149 for a Payless rental. Expedia's lowest quote, from Dollar, was \$154. If you need a car for less than a week, go to the car rental agency sites for daily rates. Otherwise, Travelocity has the greatest selectionit rummages through 59 rental agency databases, compared to Expedia's measly 13.

For traveling sans auto in Europe, riding the rails is the way to go. I priced BritRail passes over the Web (www.britrail.com) for the editor's time in England and even checked Rail Europe (www.raileurope.com) to compare costs for train travel

between London and Madrid, in case the editor decided he wanted to take the time to travel that leg by rail instead of by plane.

So-called full-service travel portals are seldom preferable because they rarely offer the best deals, and their selection is usually limited to the large chain hotels. You're better off visiting smaller sites that specialize in individual hotels and discount room rates. But beware: Booking hotel accommodations on the Web can be risky. Even when I found a low price, I couldn't be sure the seemingly charming, family-run hotel wasn't a dive or an otherwise questionable bargain. That's where another feature of the Web comes in handy: Usenet newsgroups. What bet-



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### Taken for a Ride: Pitfalls of Booking on the Web

THE WEB CAN BE A NASTY PLACE. And we're not talking about all those triple-X-rated sites. Among its many travel-related hazards, here are four. TIGHT RESTRICTIONS Virtually all discount tickets-meaning any ticket except full-fare coach, business, and first-class-are nonrefundable, and many of the cheapest discount tickets cannot be changed, even for a price. Tickets purchased through consolidators are often even more restricted; you may not be able to get a refund, for instance, even if a flight's canceled. Check the rules on a site before buying your ticket.

NO RESERVATIONS Few sites will hold a reservation, and none guarantee the price of a ticket that's being held. Travelocity holds a ticket for 24 hours, as do some airline sites, but the price isn't set until you buy the ticket.

TRAVEL SCAMS The National Fraud Information Center (www.fraud.org) that reports of travel scams, such as those offering phony vacation prizes, are increasing. Raw deals at online auctions, especially, are legion. Defend yourself with commonsense tactics, such as paying with a credit card and using an auction escrow service. And don't forget that anyone can slap together a site and list an 800 number, so stick to established sites that back their offer with guarantees and customer service.

LOUSY SERVICE Stuart Porter, a frequent traveler from the Fort Lauderdale area of Florida, found a cruise at an online travel agency, but when he reached the purchase page, he found he had to call or e-mail to finalize the deal. His e-mail wasn't returned, and he was put on indefinite hold when he phoned. "I hung up and . . . called my local travel agent, who booked the cruise while I was on the phone-same cruise, same price, better service."



ter way to find out-of-the-way gems than from fellow travelers who (presumably) have no agenda in recommending a hotel? Unless I travel to a known locale or want to stay at a trusted chain. I usually head to rec.travel.bed+breakfast and post my query; for European travel, I find the rec.travel.europe newsgroups are best. That's how I found B&B NET (www. ukexpo.com/bnb), which listed scores of home-based bed and breakfast inns for the editor's London stay (just in case he preferred to maintain a little

distance from his in-laws).

If you want to try and play it safe by staying at a chain hotel, the travel portals are a fine way to go. But they're not always the easiest to use. Expedia made me check availability individually for each hotel I wanted to peruse-a major pain. Travelocity, however, showed me availability with an icon on the search list and always displayed prices on the first results page.

Booking an out-of-the-way hotel requires more initiative. Some of the general lodging sites, such as PlacesToStay

(www.placestostay.com) and All-Hotels (www.allhotels.com), include B&Bs and discount hotels as well as chains. Hotel Discounts (www.hoteldiscounts.com) includes a lowest-rate guarantee (if you find a cheaper rate for the same hotel and dates, they'll refund the difference). At All-Hotels I found a room at the Oxford Hotel in London, a 19-room inn right across from Hyde Park, for \$96 a night. You can also use a Web search engine to find city-specific hotel lookup sites. When I head to San Francisco, for instance, I use that city's edition of RoomFinders International (www.stayinsanfrancisco.com), which searches for vacancies from more sources than the travel portals do, such as rooms left available due to canceled tours.

### **Tips for** Bargain Flying

TRAVEL OFF-SEASON IF POSSIBLE. October and November are off-peak for most airlines, especially for flights to Europe and the Caribbean.

SUBSCRIBE TO AIRLINE E-MAIL NOTIFICATION PROGRAMS. This is a good way to find out about unpublished fares and time-limited bargains. Or visit WebFlyer's Deal Watch (www.webflyer.com/@deal/@deal.html) or Travelzoo (www.travelzoo.com). Both sites compile deals from many airlines.

BE FLEXIBLE WITH TRAVEL DATES. It's cheaper to fly on Tuesday, Wednesday, or Saturday. STAY OVER SATURDAY NIGHT. Prices for "excursion fares," the industry term for weekend stayovers, can be as much as half off the price of a regular ticket.

BE FLEXIBLE WITH AIRPORTS. Choosing a smaller alternative airport (Oakland instead of San Francisco, say) can save money.

### Sights Unseen

I'D NAILED DOWN the essentials and got the editors headed to where they wanted to go, but I wanted to point my charges to some interesting sights and help them with logistics once they hit the ground. While I couldn't do that in person—PC World wasn't sending me along as tour guide-I could arm them with more

information than most agents provide.

Unless you're booking a prefabricated tour-you know, the if-it's-Tuesday-thismust-be-Tuscany kind of trips-don't expect much sightseeing advice from your typical travel agent. Agents come in handy for other jobs (see "Agent vs. Browser." page 150), but here the Web has it all over live agents. I felt like a travel titan after I dug up tons of information about things for my "clients" to do. And it didn't take more than an hour for each itinerary.

Since there's nothing worse than being lost in a strange place right off the bat, I began by making maps and airport-tohotel driving directions for my editors. MapBlast (www.mapblast.com) is great for this. Unlike the better-known MapQuest, MapBlast makes it a snap to pick an airport as your starting point by entering the airport's three-letter code. MetroPlanet (www.metropla.net) is also good; it stores mass transit maps for the world's major cities. I was able to print out maps of the London and Madrid metro systems in seconds by saving the images as GIF files, then opening them in a photo editor. A color printer is handy for this, since most maps color-code the metro lines.

For sightseeing, I start at Lonely Planet's Destinations (www.lonelyplanet.com/dest), run by the legendary Australian travel guide publisher. The writing's witty, the cited attractions usually include off-thebeaten-path locales, and the links to other Web sites are among the most unusual around. That's how I found Knowhere: A User's Guide to Britain (www.knowhere. co.uk), which divvies up London into over 80 neighborhoods, each with highlighted places to eat, things to do, and even places to skateboard (ah, whither my youth?).

> For European travel, you can't beat Rick Steves (www.ricksteves.com); sample itineraries and recommendations help

you decide what is and isn't worth seeing. And bookmark Whatsonwhen.com (www.whatsonwhen.com) to root out all kinds of events, from sports to music, across the globe. Just pick the dates you'll be in a city, then click the search button. That's how I steered the London-bound invaluable (thorntree.lonelyplanet.com).

Still, don't limit your search to the Internet. For all its breadth of content-one moment you're virtually zipping through London, the next you're eyeing a bullfight in Spain-the Internet can be as shallow as a Britney Spears lyric. You'll want to

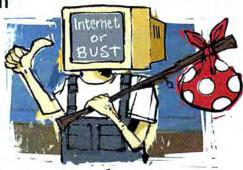
#### www.cybercaptive.com

BEING ON THE ROAD is difficult for any e-mall junkle, but this site can help you stay in touch when you're out of touch by listing 4658 Internet cafes around the world.

editor-who pined to see British sports hooliganism in action—to a soccer match taking place during the time of his stay.

An alternate approach is to use the phrase city guide name of city in a directory like Yahoo. That method helped me unearth a page of Madrid walkabout tours with stops at some of the city's most famous sights. It was harder to find info for the Providence-bound editor, but I managed to dig up something at Rough Guides about the great food in Providence's Little Italy.

But as with accommodations, some of the most valuable sightseeing advice you can get comes via word of mouth. By browsing travel-related message boards, you can get the same been-there advice that veteran travelers swap over brew in a County Cork pub. I go to Usenet's semi-anarchic newsgroups, where the exchanges are frank. "Petty thieves are a plague in the streets around the Prado and the Puerta Del Sol," warns a longtime tour guide about Madrid. Nice to know. Another post recommends a Thames boat tour for the first day in London after an overnight flight. "You can eyeball the city from the river, but you'll be sitting down in case you're tired." For general advice I also like to try rec.travel.europe and rec.travel.usacanada. Lonely Planet's newly reorganized messageboard called Thorn Tree is also



supplement the sightseeing info you get on the Net with a good guidebook or two. Those from Frommers and Lonely Planet are my favorites. (Frommers is owned by PC World's parent company, IDG.)

#### Have Web Will Travel

IN THE END, the Web makes the grade for overall travel planning and booking. For many mundane travel tasks, such as destination research and sightseeing planning, as well as straightforward, here-tothere itineraries and lodging, the Web's a smart pick; you can wrap up the job in the amount of time it takes some agents to return your phone call.

But for more complicated itineraries, I'd still call on a good agent. When you up the ante with sophisticated plans and routing, it's easy to get so bogged down in the details that you expend more time than the savings justify. You need to weigh the potential benefits against the time it'll cost to run down ultracheap deals.

Don't count on travel agents going the way of the dinosaur anytime soon. But as the Web matures and sites offer more, better, and faster features, their future may indeed be marked.



For additional tips, see www. pcworld.com/juloo/travel. online Gregg Keizer is a freelance writer

and nervous flier. Because he lives in a small Oregon city, he usually pays through the nose for flights, Web or no Web.

#### www.roadsideamerica.com

TO LIVEN UP THAT CROSS-COUNTRY road trip, check out this site, which lists 8000 wacky attractions, including the Jimmy Carter peanut in Plains, Georgia, and the Stonehenge knockoff known as Carhenge in Alliance, Nebraska.



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64 MB SyncDRAM
6.0 GB UltraDMA Hard Drive'
24X Max CD-ROM Drive'
Trident CyberBlade Hardware Accelerated
3D Graphics with 4 MB Video Memory
56K ITU V90 PCI Modem

Hi-Capacity Lilon Battery 256 KB Integrated "On-chip" cache

Personalize by choosing:

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12.0 GB UltraDMA Hard Drive : Add \$150

WEB SURFER

\$1499<sup>‡</sup>

As low as \$42 per month<sup>1</sup> QuickAccess Code: 43X531-61626

Intel Celeron Processor, 466 MHz
12.1" TFT Active Matrix Display
64 MB SyncDRAM
6.0 GB UltraDMA Hard Drive
24X Max CD-ROM Drive\*
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3D Graphics with 4 MB Video Memory
56K ITU V90 PCI Modem
Hi-Capacity Lilion Battery

128 KB Integrated "On-chip" cache Personalize by choosing:

Compaq Value Case: Add \$39 128 MB SyncDRAM: Add \$200 QuikDock: Add \$159 LATEST INTEL® TECHNOLOGY

These Compaq Presario 1800 PCs come with Intel's Mobile Pentium\* III processor, featuring Intel SpeedStep\*\* Technology. This allows you to either set the processor for maximum performance while plugged in, or for optimized battery life when on the road.

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#### TRAILBLAZER

#### PRESARIO 5900T-866

#### As low as \$70 per month QuickAccess Code: 43X531-52064

Intel Pentium III Processor, 866 MHz 128 MB 100 MHz SyncDRAM expandable to 384 MB 30.0 GB (7200 rpm) UltraDMA Hard Drive'

10X DVD-ROM Drive Creative Annihilator 32 MB w/GeForce256 Graphics Sound Blaster Live! Audio

8X CD-RW Drive

JBL Pro Amplified Speakers

Compaq CV715 17" Monitor (16,0" VIA)

#### Personalize by choosing:

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Intel Pentium III Processor, 800 MHz 128 MB 133 MHz SyncDRAM expandable to 384 MB 20.0 GB (7200 rpm) UltraDMA Hard Drive 40X Max CD-ROM Drive Creative Annihilator 32 MB vs/GeForce256 Graphics Sound Blaster Live! Value Audio Klipsch ProMedia V.2 400 Watt Speaker System Digital Creativity Imaging Center

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#### PRESARIO 5900T-733

#### As low as \$48 per month

#### QuickAccess Code: 43X531-52059P

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Sound Blaster Live! Value Audio

8X CD-RW Drive

JBL Pro Amplified Speakers

Compaq CV715 17" Monitor (16.0" VIA)

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Intel® Pentium® III Processor, 700 MHz. featuring Intel SpeedStep" Technology 15.0" TFT Active Matrix Display 64 MB SyncDRAM 12.0 GB UltraDMA Hard Drive 8X DVD-ROM Drive ATI Mobility Hardware Accelerated 3D Graphics with 8 MB Video Memory 56K ITU V.90 PCI Modem Integrated 10/100 BaseT Network Port

#### Personalize by choosing:

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#### MUSICIAN

#### PRESARIO 1800-650

#### As low as \$73 per month! QuickAccess Code: 43X531-61444

Intel Pentium III Processor, 650 MHz, featuring Intel SpeedStep Technology 15.0" TFT Active Matrix Display 64 MB SyncDRAM 12.0 GB UltraDMA Hard Drive CD-RW Drive ATI Mobility Hardware Accelerated 3D Graphics with 8 MB Video Memory

Integrated 10/100 BaseT Network Port

#### 56K ITU V.90 PCI Modem Personalize by choosing:

18.0 GB UltraDMA Hard Drive : Add \$200 192 MB SyncDRAM: Add \$300 Ultra Hi-Capacity Lilon Battery: Add \$129



#### ROAD WARRIOR

#### PRESARIO 1900-500

#### As low as \$64 per month! QuickAccess Code: 43X531-61242 Intel Pentium III Processor, 500 MHz

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#### Personalize by choosing:

128 MB SyncDRAM: Add \$200 QuikDock w/Integrated Ethernet: Add \$129 APC Notebook Surge Protector: Add \$29

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## Crucial.com: Hassle-Free Memory **Shopping Online**

www.crucial.com

Joe Swern is always on the lookout for Web sites that deliver great customer service. As the vice president of service and support for an Indianapolis, Ind.-based management software firm, his job is to help small and midsize businesses move their support operations to the Web while maintaining high levels of customer satisfaction. Recently, Swern discovered Crucial.com, a leading site for buying RAM on the Web.

"A lot of thought has obviously gone into designing and delivering their Web store," Swern says. "And I know how hard that is to do well. Crucial delivers great e-service."

Crucial.com, a division of chip maker Micron Technology, Inc., is the only DRAM manufacturer that ships memory directly to its customers. The manufacturer tests all of its modules under extreme temperatures, voltages, and operating conditions before selling them through Crucial.com's Web site and telephone sales service. Through Crucial, users can purchase the same modules that PC makers Gateway, IBM, and HP build into their base systems.

Swern first bought RAM from Crucial to upgrade his home PC. "I had tried to buy it locally," he says, "but most vendors insisted that I tear open my computer just to tell them what I needed. Then a friend directed me to Crucial.com. The site told me what my system required right there on the spot."

Shoppers can learn everything they need to know about upgrading their systems at the Crucial.com Web site. The site's unique Memory Selector walks users through



the process of identifying the exact RAM their PCs require. Customers simply enter their computer's make and model information, and the Memory Selector returns a list of Crucial memory upgrades that are guaranteed to be compatible with that system.

Swern regularly refers to the performance benchmark results for Crucial.com's RAM in the site's Comprehensive Windows® 2000 Upgrade Guide, which recommends RAM for performance PCs, lists answers to frequently asked questions, and offers information on hardware and software requirements. "The key thing for me about Crucial is that all of the questions you would logically ask are answered on the Web site," Swern says.

Swern is also "especially impressed with Crucial's ordertracking link," which he uses to check on the shipping status of his orders. For his own PC, Swern was able to use Crucial.com's Web Order Tracking System to track an order from the Micron factory straight to his home. "I could find out at every instant where my order was," he says. "I could see that it left the FedEx office in Indianapolis at 7 AM, and that my wife signed for it at home later that morning."

Swern has been so impressed by the ease of ordering RAM from Crucial.com that his company now purchases memory upgrades there, too. "Crucial is right on target for delivering excellent sales and support on the Web," he says. "With its step-by-step RAM configuration process and streamlined ordering and tracking, I can get the right RAM for my PCs without ever having to pick up the phone." >

# The world's largest PC manufacturers buy our memory direct.

Cut out the middleman.

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 have been in the computer industry for the better part of my adult life and I have NEVER seen a company deliver a product so rapidly. Kudos to Crucial for its excellent prices, pleasant staff and efficient business practices.

Lee Regnier, Nexus Onarga Academy, IS Coordinator

Crucial

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Pavilion 4530	\$126.00	\$57.59
Pavilion 4535	\$126.00	\$57.59
Kayak XU PC Workstation		
440BX Chipset	\$143.00	\$71.99
Vectra VL Series 8	\$114.00	\$57.59
Apple	Kingston	Crucial
Power Mac G3 PC100	\$126.00	\$57.59
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Crucial prices reflect an automatic 10% discount for ordering online. Prices were taken from Crucial and Kingston Web sites on 5/2/300, however, they can (and do) change daily. Prices may vary according to specific system requirement.



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JENWARE

## Bookmark This!

# Alienware Systems Offer Extraterrestrial Performance

0

#### 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!"

**Bookmark This!** 



Alienware's success is due in part to its vision of building high-performance computer systems that go beyond word-processing and net-surfing capabilities to include full-blown multimedia options. The company strives to

use the latest 3D accelerators and the best hardware possible, allowing users to custom-configure 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."

"The fastest machine we've ever tested, bar none!" - MAXIMUM PC

#### GREY

GREY

AMD Athlon 700MHz Processor w/3DNOW!
High-Performance Heatsink/Cooling System
Asus K7V KX133 Chipset Motherboard w/5PCI Slots
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Floppy Drive 1.44MB
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#### HIVE - MIND

AMD Athlon 950MHz Processor w3DNOW!
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Asus K7V KX133 Chipset Motherboard w/5PCI Slots
Kingston 128MB SDRAM (PC-133)
Floppy Drive 1.44MB
IBM Deskstar 22GXP 20.5GB 7200RPM HD
"NEW" Nyidia Geforce2 GTS 32MB DDR Video Card
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Altec Lansing ACS54 Gaming
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104-Enhanced Keyboard PS/2
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AREA 51: AURORA
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Personalized Technical Support Manual
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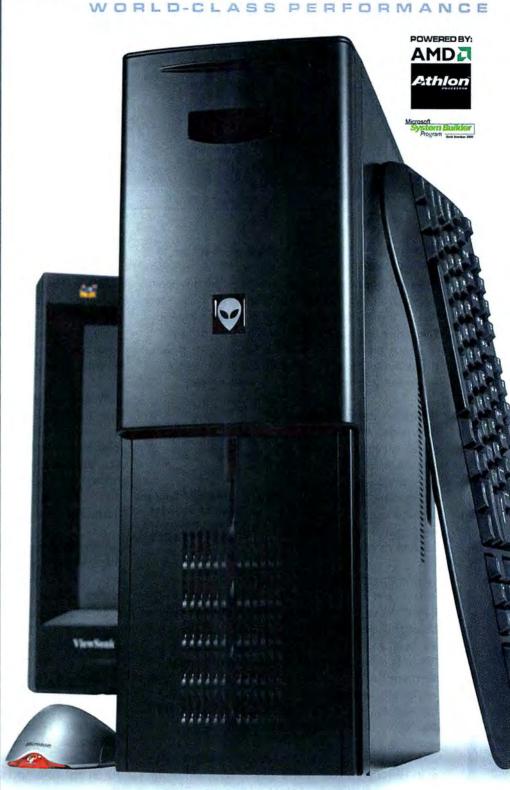
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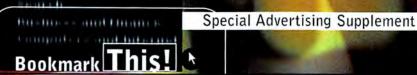












# DW.COM: Prescription for Service

www.cdw.com

While the pace of the healthcare business is enough to give any IT administrator heart palpitations, Yasser Salah never misses a beat when he provides technical support for HCIA-Sachs, a market-research firm based in Evanston, Ill. The company provides strategic information, market intelligence and analysis, and industry benchmarks to healthcare providers nationwide. Salah's job is to deliver IT services and make computer purchases for the 125 employees at company headquarters in Evanston.

HCIA-Sach's clients pay for up-todate market data-down time is not an option. To help meet the demand, Salah expects his computer vendors to be responsive, accurate, and on time. "When we need something, we need it yesterday," he says. "This is a fast-moving environment."



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

Salah buys software, printers, notebook PCs, hard drives-"and just about anything else you can think of"from CDW.com, the number-one authorized direct seller of brand names like Compaq, Computer Associates, Microsoft, and Toshiba. He started doing business with CDW.com more than two years ago, after his previous seller failed to keep up with HCI-Sachs' growth. "Our last vendor was unresponsive," Salah says. "The account manager was always late in returning my calls, and the price quotes he gave us were too high."

CDW.com assigns a designated account manager to each of its clients-someone who is easy to reach and understands the requirements of growing businesses. Salah accesses his account team through the direct phone extensions and email addresses available at CDW.com's business-to-business extranet site, CDW@work.

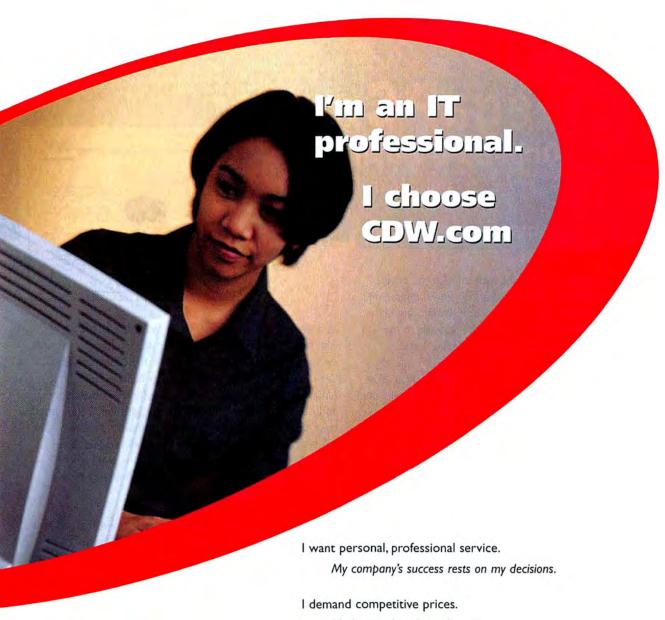
Salah's designated account manager (only his second since he started shopping at CDW.com) provides him with customized service whenever he needs it. "I would definitely give her a ten out of ten," Salah says. "She is able to answer all of my questions, and can find any itemno matter how obscure-that I might be looking for."

CDW.com's business-to-business focus saves HCIA-Sachs time and money. Salah makes one quarter of his hardware and software purchases directly through CDW@work, which provides him with volume pricing, order status information, detailed purchasing histories, and special discounts. "CDW@work helps me to find items in a hurry, and it can automatically apply volume pricing discounts," Salah notes. "It makes their prices very competitive."

Salah frequently uses CDW@work to review both invoices and shipping reports, and to find out exactly where an order is at any time. And CDW.com's Purchase History feature provides a five-year-long detailed history that helps Salah prepare his annual budgets.

CDW.com also offers businesses a Buyers' Alert feature and its own CDW Buyers' Edge electronic newsletters. Buyers' Alert notifies customers via email when the products they choose become available or fall below a certain price. And Buyers' Edge-available via email in plain text and HTML editions—gives them the inside scoop on deals and unadvertised specials for leading products.

For all that CDW.com has to offer, Salah continues to value the leverage that a dedicated account manager can offer to his business. "For me, the personal relationship makes shopping more convenient," he says. "We have some unique requirements, and our account manager meets them consistently." >



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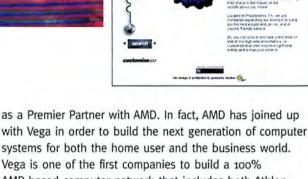
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With PC technology moving at such a fast pace, buyers want to be sure that their desktops are 100% upgradable. After all, who wants to buy a PC and then find out six months down the road that they can't upgrade to the latest component because of a compatibility issue?

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Vega has been building up its name over the last year by becoming a Microsoft System Builder Gold Member as well



with Vega in order to build the next generation of computer systems for both the home user and the business world. Vega is one of the first companies to build a 100% AMD-based computer network that includes both Athlon and K6-2 processors. Working directly with the AMD support crew, Vega has been able to create computer systems that are faster, better equipped, and more reliable than the competition. In fact, the Vega/AMD team is making it possible for the consumer to get the best-quality PC for the best possible price.

> VegaPC.com is no newcomer to great customer service and support. With over 18 years of experience in satisfying even the most demanding electronics buyer, VegaPC.com knows what it takes to satisfy customers: superior products,

personal service, and unswerving commitment to quality. We treat every one of our customers and potential customers as if they were family members. If you call or write our technical support with a computer question, you can rest assured that you will get a courteous, honest answer from one of our technicians. Even if your warranty has expired, we will continue to answer your questionsunlike our competition, which requires you to pay just to ask a simple question.

So before you go ahead and place your PC order with a big-name, proprietary desktop manufacturer, think ahead a little. Do you really want to buy a whole new PC every two years? Do you really want to spend three hours on hold just to get a simple question answered? Wouldn't you rather make your computer investment with a company that treats you like one of the family instead of a stranger? If so, then come visit VegaPC.com. It's the smart place to buy a dream machine that won't end up becoming a nightmare later on.

## The Last Computer > You Will Ever Buy



Vega and AMD have teamed up to design a new concept in computer manufacturing. With PC technology moving at such a fast pace, buyers want to be certain that their new super-computer doesn't become a superdud. The ability to upgrade and expand your computer should be an option whether it is one month or one year down the road. With our 100% open-architecture PC's, we give you the option to swap out any component for another, giving you the ability to keep your computer current with the latest technology.

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# TOP 100

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# The Leap to

BIGGER, BETTER, FASTER. We all want the best available, whether it be houses, cars, or our desktop PC. This month for the first time, the Top 100 looked at 1-gigahertz PCs, and found out that more isn't always better. At least, not yet.







BATTING 1000: The Gateway Select 1000 is the first 1-GHz PC to break into the Top 10 PCs charts.

**Edited by Katharine Dvorak** 

We looked at two systems, Gateway's Select 1000 and Polywell's Poly 800K7-1000, both with Athlon-1000 chips. We haven't yet seen a 1-GHz Pentium III system in the Top 100. As reported in May's Top of the News (www.pcworld.com/ mayoo/1gig), Intel is shipping its 1-GHz chips in limited quantities until the third quarter, which limits the units available for evaluation.

The Gateway Select 1000 earned a score of 155 on our PC WorldBench 2000 tests -impressive, but just a few points higher than similarly equipped Athlon-800 systems we've seen. The Select 1000 is also

# nertz

expensive at \$2899. Still, it squeaked onto the power chart at number ten. The Poly 800K7-1000 showed one of the highest scores we've seen yet for a Windows 98 system-162. But this Poly didn't make the Top 10 Power PCs chart due to its bankbreaking price of \$3388.

For superlative speed from a system running Windows NT, check out the Terra

AXD. Its PC World-Bench 2000 score of 194, coupled with a moderate price for a power system, helped this new entry from Axis Systems grab second place on the power behind the Sys Per-

formance 850A, which, despite a \$100 increase in price from last month, holds its number nine spot on the chart.

Two new Pentium III-866 systems posted impressive scores on PC World-Bench 2000—the Dell Dimension XPS B866r, number seven on the Power chart, and the AcerPower 8600 (which missed the chart due to its high price). This Acer, running Windows 98, scored a 157 on our performace test suite, in line with comparably powerful Windows 98-based Pentium and Athlon systems.

#### ON THE HOME PCS FRONT

SIGNIFICANT PRICE DROPS and three relatively inexpensive new systems shake up the Top 15 Home PCs chart this month. Dell, with a whopping \$410 drop in the price of the Dimension XPS B733r, keeps a firm hold on the number one spot on the power list. CyberMax adds the Value-Max 700 to the midrange section (it debuts at number four), with an Athlon-700 CPU and an impressive PC World-Bench 2000 score of 140. The price is nice, too, at only \$1249.

#### **NEW R&S RATINGS**

NEW RELIABILITY and Service reader survey results are incorporated into this month's Top 100 charts. Unfortunately, we saw no improvement over our last report in January. Only Dell was able to score high enough to rate as Outstanding for the reliability of both its business and its home systems; work PCs from Gateway, IBM, and Micron maintained a Good reliability rating.

Dell home PC users usually said they are "very satisfied" with the company's service

> and support; owners of Micron PCs told a different story, as Micron dropped a notch in every service measure. And while readers told us that their notebooks tend to break down less often than in the past, they didn't rate any company as Out-

standing for either reliability or service. (For the full story, see "PC Reliability and Service: Things Fall Apart," page 114.)

Freelance writer Joel Strauch and PC World editors Sean Captain, Lisa Cekan, Eric Dahl, Katharine Dvorak, Mick Lockey, Kalai Murugesan, Kalpana Narayanamurthi, Karen Silver, and Alan Stafford contributed to the Top 100 this month. Testing performed by Curt Buehler, Ulrike Diehlmann, Robert James, Elliot Kirschling, Jeff Kuta, Thomas Luong, Sean Tieu, and John Tjon 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 modems, 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.



POINT YOUR browser to www. pcworld.com/top400 for lateonline breaking reviews on 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.

chart. But this score DOUBLE-TAKE: In 1995 we saw the first 100is still four points MHz PCs. What a difference five years make.

## TOP 10 POWER PCs

	SYSTEM: \$2000 AND OVER	Month tested	★ Overall rating	Street price (4/14/00)	PC WorldBench 2000 performance score '	Base configuration
1	Dell Dimension XPS B800r 800/388-8542 www.dell.com	May 00	99	Expensive: \$2735	Outstanding 201	Outstanding: Pentium III-800EB, 128MB of RDRAM, 256KB L2 cache, 20.4GB hard drive, 19-inch monitor, Windows NT 4.0
2	Axis Systems Terra AXD 800/378-9014 www.axissys.com	NEW	94	Average: \$2399	Very good 194	Outstanding: AMD Athlon-850, 256MB of SDRAM, 512KB L2 cache, 30.7GB hard drive, 19-inch monitor, Windows NT 4.0
3	Micron Millennia Max 800 800/642-7667 www.micronpc.com	May 00	94	Average: \$2499	Good 149	Outstanding: Pentium III-800, 128MB of SDRAM, 256KB L2 cache, 27GB hard drive, 19-inch monitor, Windows 98 SE.
4	Dell OptiPlex GX300 800/388-8542 www.dell.com	May 00	93	Very expensive: \$2948	Very good 165	Very good: Pentium III-733, 128MB of RDRAM, 256KB L2 cache, 20GB hard drive, 19-inch monitor, Windows 2000 Pro
5	Gateway GP7-800 800/315-2536 www.gateway.com	June 00	92	Average: * \$2428	Good 156	Outstanding: Pentium III-800, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
6	Quantex SM800 800/896-4898 www.quantex.com	June 00	92	Inexpensive: \$2149	Good 148	Outstanding: Pentium III-800, 128MB of SDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
7	Dell Dimension XPS B866r 800/388-8542 www.dell.com	NEW	91	Very expensive: \$3179	Outstanding 170	Outstanding: Pentium III-866, 128MB of RDRAM, 256KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 2000 Pro
8	Polywell Poly 800K7 800/999-1278 www.polywell.com	May 00	89	Average: \$2275	Good 151	Outstanding: AMD Athlon-800, 128MB of SDRAM, 512KB L2 cache, two 13.5GB hard drives, 19-inch monitor, Windows 98 SE
9	Sys Performance 850A 800/613-9963 www.sys.com	June 00	89	Expensive: \$2799	Outstanding 198	Outstanding: AMD Athlon-850, 128MB of SDRAM, 512KB L2 cache, two 20.5GB hard drives, 19-inch monitor, Windows NT 4.0
10	Gateway Select 1000 800/315-2536 www.gateway.com	NEW	88	Very expensive: \$2899	Good 155	Outstanding: AMD Athlon-1000, 128MB of SDRAM, 512KB L2 cache, 30GB hard drive, 19-inch monitor, Windows 98 SE
	Best Buy	Percent of overa	II 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 179.



GOT CPU ENVY? If you simply must have the latest in processor power (and you've got the cash to pay for it), the machines on this month's chart just might satisfy your

craving. Three speedy new systems appear on the chart, including the Gateway Select 1000—the first 1-gigahertz PC on the Top 10.

#### DELL DIMENSION XPS B800R



WHAT'S HOT: Throw a PIII-800 CPU into a Windows NT 4.0 machine, and you've got ripsnorting

speed: This Dell's score of 201 on our PC WorldBench 2000 tests is the highest attained by any NT system we've seen. Top-drawer extras include an 8X/4X/32X CD-RW drive, an Iomega Zip 100 drive, both a modem and a network card, and Microsoft Office 2000 Small Business Edition. Dell cut the price almost \$500 this month, lifting this PC into first place. WHAT'S NOT: Even with the price drop, the Dimension XPS B8oor is still fairly expensive at \$2735. And while Dell provides ample documentation for the standard equipment, our unit lacked paperwork for some extra components.

WHAT ELSE: The system uses high-priced, high-speed Rambus DRAM (RDRAM), which is designed to rev up memoryintensive apps. Despite the add-in goodies, this Dell still provides two open PCI slots and three open bays in its neat interior. You also get a quick-setup manual and a thick troubleshooting guide.

BEST USE: For users who must have everything-regardless of sticker pricethis Dell looks like a million bucks.

#### 2 AXIS SYSTEMS TERRA AXD



WHAT'S HOT: For less money than some of the other systems on the power chart, this \$2399 Axis

NEW abounds with multimedia features, including an 8X DVD-ROM drive bolstered by a hardware decoder card and a Cambridge SoundWorks FPS1000 fivespeaker set pumping out rich surround sound. With an AMD Athlon-850 CPU and Windows NT 4.0, the Terra earned a score of 194 on our PC WorldBench 2000 tests-not the highest we've seen in similarly configured systems, but well above par. Colors on the 19-inch Axis 900CX monitor appear vibrant, and text looks sharp at the standard resolutions.

WHAT'S NOT: The two drive bays block access to the free RAM slots, making it a bit of a chore to add more memory. You also have to remove four screws and tug off the entire case to get inside.

WHAT ELSE: A detailed system manual

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)
Outstanding: Celestica NVidia GeForce 256 graphics card with 32MB of RAM, 8X/4X/32X CD- RW drive, V.90 modem, network card, lomega Zip 100 drive, Microsoft Office 2000 SBE	Good: includes top-notch monitor; midsize tower; 3 open drive bays, 2 open slots	Outstanding	Good/ Good	24/7, toll-free	3/1
Very good: Creative Labs Annihilator Pro graphics card with 32MB of DDR RAM, 8X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem	Good: easily removable case; midsize tower; 2 open drive bays, 3 open slots	3	Good 3/ Outstanding	24/7, toll-free	5/3
Good: NVidia GeForce 256 AGP graphics card with 32MB of RAM, 12X DVD-ROM drive, V.90 modem, case lock, Microsoft Office 2000 Small Business Edition	Very good: roomy case; midsize tower; 5 open drive bays, 4 open slots	Good	Fair/ Outstanding	24/7, toll-free	Varies 4/3
<b>Very good:</b> NVidia GeForce 256 graphics card with 32MB of RAM, 8X/4X/32X CD-RW drive, network card, chassis intrusion detection, case lock, Wake on LAN, Microsoft Natural Keyboard	Good: swing-out power supply; midsize tower; 3 open drive bays, 5 open slots	Outstanding	Good/ Outstanding	24/7, toll-free	3/3
Good: NVidia RIVA TNT2 graphics accelerator graphics card with 32MB of RAM, 17X-40X CD- ROM drive, network card, Microsoft Office 2000 Small Business Edition, Microsoft IntelliMouse	Good: easy access to memory sockets; tower; 6 open drive bays, 3 open slots	Good	Fair/ Outstanding	24/7, toll-free	3/3
Good: NVidia GeForce 256 AGP graphics card with 32MB of RAM, 12X DVD-ROM drive, V.90 modem, lomega Zip 250 drive, Corel WordPerfect Office 2000	Good: multimedia keyboard; minitower; 3 open drive bays, 4 open slots	Fair <sup>3</sup>	Fair '/ Good	24/7, toll-free	3/1
Outstanding: NVidia GeForce DDR graphics card with 64MB of RAM, 8X/4X/32X CD-RW drive, 0.90 modem, network card, lomega Zip 100 drive, Microsoft Office 2000 Professional	Good: easy motherboard access; midsize tower; 3 open drive bays, 2 open slots	Outstanding	Good/ Good	24/7, toli-free	3/1
<b>Very good:</b> NVidia GeForce 256 AGP graphics card with 32MB of RAM, 8X DVD-ROM drive, V.90 modem, Iomega Zip 100 drive, Lotus SmartSuite Millennium, RAID card	Good: one-piece case slides off easily; minitower; 3 open drive bays, 3 open slots	,	Fair ³/ Good	24/7, toll-free	3/5
Good: Matrox G400 Maxx graphics card with 32MB of RAM; 17X-40X CD-ROM drive, network card, case lock, RAID card	Very good: room for expansion; midsize tower; 4 open drive bays, 3 open slots	•	Good 3/ Good	24/7, toll-free	Varies 1/5
Dutstanding: NVidia RIVA TNT2 graphics card with 32MB of RAM, 12X DVD-ROM drive, 1X/4X/24X CD-RW drive, V.90 modem	Good: multimedia keyboard; midsize tower; 4 open drive bays, 3 open slots	Good	Fair/ Outstanding	24/7, toll-free	3/3
Extra features: 10 percent	Design and expandability: 15 percent	Reliability: 15 percent	Support a	and warranty: 15	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.

offers substantial troubleshooting and upgrading information, and Axis provides thorough documentation for individual components. The midsize tower has three open PCI slots and two open bays. The 8X/4X/32X CD-RW drive lets you back up your data quickly.

BEST USE: With its loads of multimedia features, this Axis would make an excellent presentation system.

#### 3 MICRON MILLENNIA MAX 800

WHAT'S HOT: A well-designed interior offers four open slots and five open bays, and its power supply swings out for even more elbow room. Text stayed sharp up to the unbelievably high resolution of 2048 by 1536 on the 19-inch Micron Trinitron CPD-4401 monitor. Colors appeared rich (if a tad dark) on our test images.

WHAT'S NOT: There's neither a removable storage option nor a CD-RW drive. And this PIII-800 unit scored just 149 on our

PC WorldBench 2000 tests-only six points better than its PIII-677 cousin, the Millennia Max 667.

WHAT ELSE: This \$2499 Millennia earns a plus for documentation, thanks to its setup poster and thorough system manual, but it lacks some component manuals. The large midsize tower features twin fans, a case lock, and a side that pops off smoothly (though reattaching it takes some fiddling). The 800-MHz unit's motherboard provides both Slot 1 and Socket 370 processor slots, which allows you to upgrade the system with either type of CPU.

BEST USE: With its excellent monitor, this PC makes a pretty presentation system.

#### 4 DELL OPTIPLEX GX300

WHAT'S HOT: Running Windows 2000 Professional, the OptiPlex GX300 posted a PC WorldBench 2000 score of 165, trail-



EXTRA! EXTRA! The Axis Systems Terra AXD comes with both a DVD-ROM and CD-RW drive.

ing the Windows NT machines but outpacing all the Win 98 systems on the chart. A tidy interior provides chassis intrusion detection, a case lock, a swingout power supply, five open PCI slots, and three open (and toolless) drive bays. Dell's 19-inch UltraScan P991 monitor >

<sup>\*</sup> Five years on CPU and main RAM, three years on other parts.

Six years on CPU and main RAM, three years on other parts.

WHAT'S NOT: This \$2948 OptiPlex is hardly cheap. Dell posts most of its documentation online; the print version of the main system manual contains only the bare minimum, and paper documentation for individual components isn't included (though you can order it for free).

WHAT ELSE: Despite the easy-service chassis, the memory slots are buried, and the interior feels cramped until you swing the power supply out of the way. But thanks to the 8X/4X/32X CD-RW drive, making backups is fast and easy.

BEST USE: For businesses that want to get started with Windows 2000 Pro as soon as possible, this OptiPlex offers a substantial bang, albeit for a lot of bucks.

#### 5 GATEWAY GP7-800

WHAT'S HOT: A speedy PC WorldBench 2000 score of 156 places the Gateway GP7-800 in the front of the pack among similarly configured PIII-800 systems. The gargantuan tower offers lots of room for expansion, with three open PCI slots and six open bays. Bundled with a network interface card, a hefty 30GB hard drive, and Microsoft Office 2000 Small Business Edition, the GP7-800 is ready for business.

WHAT'S NOT: For \$2428, we would expect a DVD-ROM or CD-RW drive, but the system ships with a standard 17X-40X CD-ROM drive.

WHAT ELSE: Colors on the 19-inch Gateway EV910 monitor look rich but a bit dark, while text remains sharp up to the maximum resolution of 1600 by 1200. The system is simple to set up, with labeled, colorcoded ports and a side panel that's easy to remove and reconnect. The system manual is thick and features helpful color illustrations, useful upgrading tips, and troubleshooting information.

BEST USE: For those who need performance and expandability, the GP7-800 won't disappoint.

#### 6 QUANTEX SM800

5000

WHAT'S HOT: Earning a score of 148 on our PC WorldBench 2000 tests, the SM800 turned in above-average performance for a PIII-800 running Windows



THERE'S PLENTY OF ROOM in the Micron Millennia Max 800: four open slots and five open bays.

98. If the monster-size 30GB hard drive proves insufficient for your storage needs, you can use the included Iomega Zip 250 removable-media drive. The SM800 also uses an NVidia GeForce 256 AGP graphics card for outstanding image quality.

WHAT'S NOT: The somewhat flimsy side panel of this minitower takes some work to reattach. At its bargain \$2149 price, the system lacks a network interface card, which might limit connectivity options.

WHAT ELSE: The SM800 provides lots of room for expansion, with four open slots (three PCI and one ISA) and three open bays, but the system's somewhat cramped interior makes access difficult. The solid multimedia keyboard supports smooth typing, and its extra programmable buttons allow handy shortcuts. Corel Word-Perfect Office 2000-a strong suite of software tools for the small-office usercomes bundled with the system.

BEST USE: The business extras and its solid performance make this PC at home in a nonnetworked small office.

#### 7 DELL DIMENSION XPS B866R

NEW WHAT'S HOT: Running Windows 2000 Professional and with a Pentium III-866 CPU inside, this Dimension hustles, earning a score of 170 on our PC WorldBench 2000 tests. The XPS B866r also includes some of the latest hardware and software within its midsize tower: an Iomega Zip 100 drive, a fast 8X/4X/32X CD-RW drive, and a 30GB hard drive for plenty of storage and backup room; and both a network interface card and a

### Microsoft Windows 2000...in 2000?

TECH TREND THE LATEST ITERATION of Microsoft's operating system-Windows 2000-has been slow to show up in the systems on our Top 10 PCs charts. While some PC vendors are readily offering Windows 2000, others say their customers don't want to make the transition from Windows NT to the new OS just yet.

Windows 2000 first appeared on the May Top 10 Power PCs chart, in the Dell OptiPlex GX300 (number four this month). According to Anne Camden, a Dell spokesperson, the upgrade rate to Windows 2000 has been about what the company expected. "[The upgrade] has not been, nor will it be, a quick transition," she says.

Axis Systems offers Windows 2000 as an option, but Willy Hsu, an Axis spokesperson, says that the company is not getting many requests for the new OS. "Only about a quarter of our [customers] have said that they're considering upgrading in the next three

months-they want to wait for all the bugs and incompatibilities to be worked out."

Other vendors are more readily making the change. "There really isn't any...reluctance on Micron's part," says Patrick Kimball, a Micron spokesperson.

Even those customers who are reluctant to embrace Windows 2000 don't have any disparaging remarks about the OS, says Axis Systems' Hsu. "Nobody's saying it's a bad operating system, but the main response we've been getting has been, 'Not yet'."



### Dang. Forgot the racing stripes.

But that's about it, in terms of souped-up, sports-car qualities. Introducing TurboRing, the world's first trackball with patented Scroll Ring™ technology and three programmable buttons. Now, you can blast through long documents. And whiz through Web pages. All in sheer, ergonomic bliss. The idea of comfort and handling at high speeds is coming to a whole new Autobahn. Your desktop. For more information, visit www.turboring.com. And please, buckle up.

KENSINGTON.

Smart design at work.

modem. The 19-inch Dell UltraScan P991 monitor won't disappoint either. Powered by an NVidia GeForce double data rate graphics card, it displays rich colors, and text remains crisp at the maximum resolution of 1600 by 1200.

WHAT'S NOT: Of course, you can expect to pay for all of these extras: At \$3179, this Dimension is the most expensive PC on the chart. The components also contribute to a somewhat cluttered interior.

WHAT ELSE: Documentation includes a helpful setup poster and a huge reference and troubleshooting guide, but you get no manuals for individual components. Accessing the system's interior is simple, thanks to a thumbscrew that enables the side to slide on and off easily. Two open PCI slots and three open bays provide room for expansion.

BEST USE: For an office that's looking for the latest and greatest features with performance to match-and is immune to sticker shock-this Dell will fit right in.

#### 8 POLYWELL POLY 800K7

WHAT'S HOT: The 800K7's score of 151 on PC WorldBench 2000 tests was one of the highest we've seen so far for an Athlon-800 unit running Windows 98. The 19-inch ViewSonic E790 monitor displays rich, deep colors and easily readable text at up to 1600 by 1200 resolution. And because the NVidia GeForce 256 AGP graphics card includes a digital output port, you can use it to drive a digital flatpanel monitor.

WHAT'S NOT: The Poly's cramped interior doesn't give you much room to work, and the rear ports are labeled with stickers that could easily come off. WHAT ELSE: This machine uses two 13.5GB hard drives connected to an IDE RAID card to speed disk-

system manual holds lots of information but too few pictures.

intensive tasks. The thick

BEST USE: This Polywell makes a fast utility vehicle for a small office.

#### 9 SYS PERFORMANCE 850A

WHAT'S HOT: Coming with twin 20.5GB hard drives (connected by a Promise Ultra ATA/66 RAID card), the Sys Performance 850A offers ample storage. One of the first Athlon-850 systems we've tested for the Top 100, it zoomed to a score of 198 on our PC WorldBench 2000 benchmark tests-respectably high even for a system running Windows NT 4.0.

WHAT'S NOT: The price of the 850A increased \$100 from last month. For \$2799, we'd like to see more than just a standard 17X-40X CD-ROM drive.

WHAT ELSE: The 19-inch ViewSonic Professional Series PF790 monitor displays crisp text up to the maximum resolution of 1280 by 1024, but colors look washed out. The Matrox G400 Maxx graphics card offers comprehensive output op-

> tions: dual-head display, S-Video, and composite out for connecting a second monitor or for television or DVD playback.

> > BEST USE: With a speedy Athlon-850 CPU inside, this PC should keep power users ahead

of the performance curve for a while.

10 GATEWAY SELECT 1000

NEW WHAT'S HOT: Multimedia features highlight this Gateway, the first 1-GHz system on the chart. Movies on the 12X DVD-ROM drive look sharp and steady, and the 19inch Gateway VX900 monitor produces vibrant colors and crisp text even at 1600 by 1200 resolution. Other handy extras include a sturdy multimedia keyboard with several programmable buttons as well as a 4X/4X/24X CD-RW drive should the 30GB hard drive prove insufficient for

TAKE A PEEK INSIDE: Guide rails let the

side panel of the Gateway Select 1000 slide

off, allowing easy access to the interior. You'll find three

open slots and four open drive bays for expansion.

your storage needs.

WHAT'S NOT: You'll pay steeply (\$2899) for the Athlon-1000 CPU inside without getting any benefit in added performance: The PC WorldBench 2000 score of 155 is one of the slowest for all gigahertz systems we've tested so far-and barely faster than the similarly configured Athlon-850 systems we've seen.

WHAT ELSE: Opening the tall midsize tower is simple; after removing two large thumbscrews, the solid system side slides off and back on smoothly via guide rails. Although cables clutter the interior somewhat, three open PCI slots and four open drive bays provide lots of expansion room. BEST USE: For those lusting after a gigahertz machine, the Gateway Select 1000 certainly meets the spec. But buyers needing power can find better value in a less expensive system.

#### ALSO NEW THIS MONTH



WE EVALUATED the following systems along with the others, but they didn't score high enough to reach the Top 10

Power PCs chart. For write-ups, visit PCWorld.com (www. pcworld.com/t10pcs).

- ABS Performance 1 Athlon
- AcerPower 8600
- Polywell Poly 800K7-1000



A SINGLE SERIAL: The Dell Dimension XPS B866r provides one serial port and two USB ports for hooking up peripheral devices such as a mouse, an external modem, and a digital camera.

# Small Price Huge Value

### WinBook Si

If you're searching for a high-performance multimedia notebook that doesn't come with a high-end price tag, take a closer look at this new WinBook Si.





### Intel<sup>®</sup> Pentium<sup>®</sup> III processor

# 600MHz Active Matrix 64 MB, 6 GB

This powerful notebook has all of the features you'll find in computers costing thousands more. Get the latest technology at the lowest Intel® Pentium® III processor price from WinBook today.

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## **TOP 10 MIDRANGE PCs**

	SYSTEM: \$1200 TO \$1999	Month tested	★ Overall rating	Street price (4/14/00)	PC WorldBench 2000 Faster performance score	Base configuration
1	Dell Dimension XPS T600r 800/388-8542 www.dell.com	May 00	92	Average: \$1519	Good 136	Very good: Pentium III-600E, 128MB of SDRAM, 256KB L2 cache, 20.4GB hard drive, 17-inch monitor, Windows 98 SE
2	CyberMax Enthusiast K7-750 800/437-4596 www.cybermaxpc.com	June 00	88	Average: \$1549	Outstanding 154	Very good: AMD Athlon-750, 128MB of SDRAM, 512KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
3	Micro Express MicroFlex-850A 800/989-9900 www.microexpress.net	NEW	88	Inexpensive: \$1449	Outstanding 153	Very good: AMD Athlon-850, 128MB of SDRAM, 512KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
4	Gateway Select 700SB 800/315-2536 www.gateway.com	NEW	87	Inexpensive: \$1499	Very good 144	Very good: AMD Athlon-700, 128MB of SDRAM, 512KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
5	Micron Millennia Max 733 800/642-7667 www.micronpc.com	NEW	87	Average: \$1699	Very good 148	Very good: Pentium III-733, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
6	Quantex SM700 800/896-4898 www.quantex.com	June 00	86	Average: \$1599	Very good 143	Very good: Pentium III-700, 128MB of SDRAM, 256KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
7	Dell OptiPlex GX110 800/388-8542 www.dell.com	NEW	85	Expensive: \$1758	Very good 140	Good: Pentium III-667, 128MB of SDRAM, 256KB L2 cache, 10GB hard drive, 17-inch monitor, Windows 98 SE
8	Systemax Ascent PVO-600A 800/875-8430 www.systemaxpc.com	May 00	84	Inexpensive: \$1449	Good 131	Very good: AMD Athlon-600, 128MB of SDRAM, 512KB L2 cache, 20GB hard drive, 17-inch monitor, Windows 98 SE
9	Axis Systems Orion CXV 800/378-9014 www.axissys.com	May 00	84	Expensive: \$1707	Good 132	Outstanding: Pentium III-600, 128MB of SDRAM, 256KB L2 cache, 20.5GB hard drive, 19-inch monitor, Windows 98 SE
10	NuTrend AMD K7-600 888/482-6678 www.nutrend.com	June 00	82	Inexpensive: \$1499	Good 127	Outstanding: AMD Athlon-600, 128MB of SDRAM, 512KB L2 cache, 20,5GB hard drive, 19-inch monitor, Windows 98 SE
	Best Buy	Percent of overa	all rating >	Price: 17 percent	Performance: 18 percent	Base configuration: 10 percent

<sup>&#</sup>x27;A system's performance word score is relative to the scores earned by other PCs running the same operating system. See "Your Guide to the Top 100" on page 179.



DELL'S TOP-NOTCH RELIABILITY and support ratings keep the Dimension XPS T600r ahead of the Cyber-Max Enthusiast K7-750 and the MicroFlex-850A, a speedy

newcomer from Micro Express that sports a hard-to-beat price of \$1449 for an Athlon-850 CPU. Three new machines from Dell, Gateway, and Micron also hit the chart this month, each earning an impressive PC WorldBench 2000 score and selling for a moderate price.

#### 1 DELL DIMENSION XPS T600R



WHAT'S HOT: With a Pentium III-600 CPU and running Windows 98, this Dimension earns a hearty

PC WorldBench 2000 score of 136-on a par with some PIII-700s we've tested. Four open slots (three PCI and one ISA) and four open bays offer room for expansion components in this midsize tower's smallish interior. You pay a reasonable \$1519 and still get Microsoft Office 2000 Small Business Edition.

WHAT'S NOT: You can type smoothly on the solid Dell QuietKey keyboard, but not as quietly as its name suggests. The Dimension's standard labor warranty lasts for only one year.

WHAT ELSE: The system ships with thorough documentation, including a setup poster and guide, and a thick reference and troubleshooting manual. The side of the case comes off easily after you loosen a thumbscrew and lift two levers. Dell's PCs earn Outstanding reliability scores.

BEST USE: With its high-end office suite, this Dimension would excel as a robust system for small businesses.

## 2 CYBERMAX ENTHUSIAST



WHAT'S HOT: Quicker than some Athlon-800 systems we've tested, this Enthusiast posted an impres-

sive PC WorldBench 2000 score of 154, and its \$1549 price tag won't break the bank. The machine is easy to put together, with a handy quick-setup guide, colorcoordinated ports, and a detailed system manual filled with helpful illustrations.

WHAT'S NOT: We weren't impressed with the PC's display-colors on the 17-inch CyberMax CX750N monitor appeared washed out in all our image tests.

WHAT ELSE: Although the case comes off easily, accessing the five open slots (four PCI and one ISA) and four open bays is difficult in the fairly cluttered interior. The

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 ?	Vendor's system reliability	Tech support quality/ policies	Tech support (hours/days, charge)	Warranty for parts/labor (years)
<b>Very good:</b> NVidia TNT2 M64 graphics card with 32MB of RAM, 17X-48X CD-ROM drive, V.90 modem, Microsoft Office 2000 Small Business Edition, Microsoft IntelliMouse	Good: solid, easy-to-remove side panel; midsize tower; 4 open drive bays, 4 open slots	Outstanding	Good/ Good	24/7, toli-free	3/1
Good: NVidia GeForce 256 graphics card with 32MB of RAM, 12X DVD-ROM drive, V.90 modem, Corel WordPerfect Office 2000	Very good: sleep and reset buttons on case; midsize tower; 4 open drive bays, 5 open slots	Fair '	Fair '/ Good	24/7, toll-free	3/1
Good: ATI Rage 128 Pro graphics card with 32MB of RAM, 6X DVD-ROM drive, V.90 modem	Good: unimpeded access to expansion slots; midsize tower; 4 open drive bays, 3 open slots	1	Fair '/ Outstanding	24/7, toll-free	4/4
Good: NVidia RIVA TNT2 M64 graphics card with 16MB of RAM, 17X-40X CD-ROM drive, network card, Microsoft Office 2000 Small Business Edition, Norton AntiVirus	Good: strong, sturdy case; midsize tower; 5 open drive bays, 3 open slots	Good	Fair/ Outstanding	24/7, toll-free	3/3
Very good: NVIdia TNT2 Pro graphics card with 32MB of RAM, 12X DVD-ROM drive, network card, Microsoft Office 2000 Small Business Edition	Good: case lock; midsize tower; 5 open drive bays, 5 open slots	Good	Fair/ Outstanding	24/7, toll-free	Varies 1/3
Good: NVidia Riva TNT2 graphics card with 32MB of RAM, 12X DVD-ROM drive, V.90 modem, Iomega Zip 250 drive, Corel WordPerfect Office 2000	<b>Very good:</b> multimedia keyboard; minitower; 3 open drive bays, 4 open slots	Fair <sup>3</sup>	Fair '/ Good	24/7, toll-free	3/1
Good: NYIdia TNT M64 PCI graphics card with 16MB of RAM, 20X-48X CD-ROM drive, network card, Microsoft Intellimouse	Good: chassis intrusion detection; case lock; midsize tower, 3 open drive bays, 3 open slots	Outstanding	Good/ Outstanding	24/7, toll-free	3/3
Good: NVidia Vanta graphics card with 16MB of RAM, 4X/4X/24X CD-RW drive, V.90 modem, Microsoft Office 2000 Small Business Edition	Very good: easy access via handy lever; midsize tower; 4 open drive bays, 4 open slots	,	Fair '/ Good	24/7, toll-free	Varies */1
Good: Creative TNT2 Pro graphics card with 32MB of RAM, 8X DVD-ROM drive, 4X/4X/24X CD-RW drive, V.90 modem	Very good: lots of storage room; midsize tower; 2 open drive bays, 4 open slots	3	Good '/ Outstanding	24/7, toll-free	5/3
Good: ATI Rage 128 graphics card with 32MB of RAM, 8X DVD-ROM drive, V.90 modem, Corel WordPerfect Office 2000	Good: multimedia buttons on keyboard; midsize tower; 4 open drive bays, 4 open slots	3	Fair '/ Good	24/7, toll-free	3/Lifetime
Extra features: 10 percent	Design and expandability: 15 percent	Reliability: 15 percent	Support a	nd warranty: 15	percent

<sup>&</sup>lt;sup>3</sup> 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.



ROADRUNNER: The MicroFlex-850A from Micro Express boasts impressive speed at moderate cost.

generous software bundle offers Corel's WordPerfect Office 2000, Grolier's Multimedia Encyclopedia Deluxe Edition on DVD-ROM, and Sierra's Visual Home and Master Cook CD-ROMs.

BEST USE: The Enthusiast K7-750 packs performance and features that any homeor small-office user would appreciate.

#### 3 MICRO EXPRESS MICROFLEX-850A

NEW WHAT'S HOT: For only \$1449, Micro Express packs a speedy Athlon-850 CPU inside the MicroFlex-850A. The system, running Windows 98, earned a 153 on our PC WorldBench 2000 tests-the highest we've seen for similarly configured Athlon-850 systems. The easy-open midsize case, secured by one thumbscrew, allows unimpeded access to three open PCI slots and four open bays. Micro Express offers a generous four-year warranty on both parts and labor.

WHAT'S NOT: Colors on the 17-inch Impression 7VX monitor looked rich, but text blurred slightly at a standard resolution of 1024 by 768. In our anonymous calls to Micro Express's tech support lines, we received only Fair service. Also, you must call the company to get the \$1449 price; on its Web site, Micro Express

prices this system at more than \$2100.

WHAT ELSE: Detailed setup information in the spiral-bound system manual and color-coordinated ports make the Micro-Flex easy to set up. The manual contains a handy phone list for major component manufacturers and a detailed glossary. Typing on the Microsoft Internet keyboard is smooth and quiet, with plenty of programmable Web buttons for quick access to Internet and system apps.

BEST USE: The Micro Express MicroFlex-850A provides heady performance at a great price for any small office.

#### 4 GATEWAY SELECT 700SB

NEW WHAT'S HOT: With an Athlon-700 CPU inside and Windows 98 on the 20GB hard drive, the Select 700SB earned a PC WorldBench 2000 score of 144-above average for similarly configured systems. Three USB ports ease the transition for users leaning toward

<sup>\*</sup>Five years on CPU and main RAM, three years on other parts.

legacy-free machines. The Select 700SB ships with a network interface card and Microsoft Office 2000 Small Business Edition and has a low \$1499 price.

WHAT'S NOT: Unfortunately, the fan inside could cool an extra room in your house: Five inches in diameter, it crowds the interior and impedes access to the three open slots and five open bays.

WHAT ELSE: Thanks to guide rails along the side of the solid midsize tower, the side panel slides on and off smoothly after you loosen two thumbscrews, but you have to work around the monstrous system fan to add cards or drives (there's a generous allotment of three open PCI slots and five open drive bays). Colors on the 17-inch Gateway EV700 monitor looked a tad washed out, but text appeared crisp at a standard resolution of 1024 by 768 (though blurred a bit at the maximum resolution of 1280 by 1024).

**BEST USE:** Strong performance, handy business extras, and low price make this Gateway a solid choice for small offices.

#### 5 MICRON MILLENNIA MAX 733

WHAT'S HOT: Expansion, expansion, expansion, expansion. The Millennia Max 733 offers five open PCI slots, five open bays, and both Socket 370 and Slot 1 CPU slots on the motherboard (so you can upgrade with a processor of either type). It offers a network interface card and a case lock. Setting up this Micron is simple, thanks to the helpful setup poster and color-coor-

dinated rear ports. The extensive system manual contains a thorough glossary and lots of illustrations.

what's NOT: The system lacks documentation for individual components. In our tests, colors on the 17-inch Micron 700DX monitor appeared somewhat washed out, al-

though text remained crisp up to the maximum resolution of 1280 by 1024.

WHAT ELSE: This Micron's PC WorldBench 2000 score of 148 is average for PIII-733 systems running Windows 98. Its moderate

\$1699 price includes Microsoft Office 2000 Small Business Edition. The neat interior of the Millennia's roomy midsize tower offers toolless, easy-load expansion slots and a swing-out power supply. The sturdy side pops off easily with a slide-up handle (but reattaching the panel does take some work).

BEST USE: The Millennia Max 733 is an excellent system for a small office environment planning on future upgrades.

#### 6 QUANTEX SM700

WHAT'S HOT: The Quantex SM700 is simple to set up, thanks to color-coordinated ports labeled with icons and to substantial documentation, including guides for system components. Users with big storage needs will like the 20GB hard drive and Iomega Zip 250 drive. The SM700 also

comes with useful small-office features such as a 12X DVD-ROM drive and Corel WordPerfect Office 2000.

WHAT'S NOT: You will have a tough time trying to reattach the

the cramped interior adds extra work to your expansion efforts. WHAT ELSE:

case's flimsy side, and

With a score of 143 on our PC WorldBench 2000

tests, the SM700 keeps pace with comparable Pentium III-700 systems. Colors on the 17-inch Quantex XP175D monitor were deep and rich; text looked sharp at standard resolutions but blurred at higher ones. An S-Video output port on the NVidia RIVA TNT2 graphics card lets users switch between a TV and the monitor. Inside, four open slots (including three PCI) and three open bays provide adequate room to expand.

COOL DOWN: The Gateway

Select 700SB includes an un-

usually large fan-a full 5 inches

in diameter-inside the midsize tower.

**BEST USE:** A small office looking for a lot of storage and midlevel performance would be pleased with this Quantex.

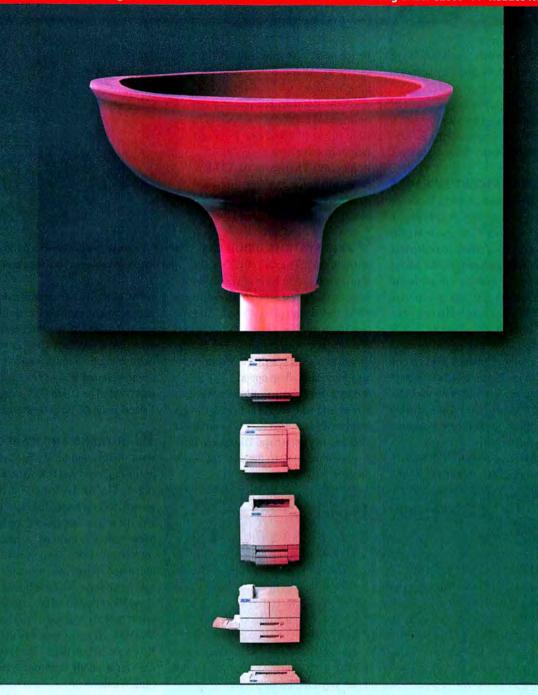
#### 7 DELL OPTIPLEX GX110

WHAT'S HOT: An excellent interior design makes expanding this OptiPlex simple—you don't even need tools to fill the three open PCI slots and three open bays, and the power supply swings out to give you more room to work. Though priced as a midrange system (\$1758), this OptiPlex is rich with corporate extras, including a network interface card, a case lock, and chassis intrusion detection.

WHAT'S NOT: While the OptiPlex ships with detailed online documentation, it lacks manuals for individual components. WHAT ELSE: With a score of 140 on our PC WorldBench 2000 tests, the OptiPlex lands in the middle of the pack of Pentium III-667 PCs we've seen running Windows 98. Accessing the interior is easy: The side of the midsize tower slides off after you press a button on the front of the case, though replacing it takes some finagling. Colors appeared bright and deep, and text looked crisp up to 1280 by ▶



SWING OUT: The power supply inside the Micron Millennia Max 733 swings out for easy access to the open slots and drive bays. The midsize tower also includes a case lock to protect what's inside.



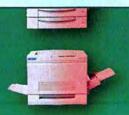
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1024 resolution on the 17-inch Dell M770 monitor. Dell's sturdy QuietKey keyboard enables smooth and quiet typing.

BEST USE: The OptiPlex GX110 would be at home in a corporate environment; it should please businesses looking for a dependable PC that won't drain the budget.

#### 8 SYSTEMAX ASCENT PVO-600A

WHAT'S HOT: Solid multimedia hardware surrounds this reasonably priced (\$1449) machine. The 17-inch AOC Spectrum7Glr monitor displays rich colors and crisp text, and the Cambridge SoundWorks SBS52 three-speaker set pumps out powerful sound. Unless you traffic in gargantuan files, the 20GB hard drive will take a while to fill up, and the 4X/4X/24X CD-RW drive lets you write and rewrite data to your heart's content. Interior access is outstanding: The midsize tower's case pops off when you depress a lever on the side. WHAT'S NOT: Although it permits smooth and quiet typing, the keyboard feels flimsy and flexes too easily.

WHAT ELSE: The Ascent PVO-600A earned a score of 131 on our PC WorldBench 2000 test suite-about average for an Athlon-600 system running Windows 98 SE. Cables crisscross the interior, but you still get unimpeded access to the four open slots (three PCI and one ISA) and four open drive bays.

BEST USE: Thanks to its CD-RW drive, top-notch monitor, and good sound system, this PC makes an attractive multimedia system.

#### 9 AXIS SYSTEMS ORION CXV

WHAT'S HOT: The Orion CXV's PC WorldBench 2000 score of 132 makes

it one of the fastest Pentium III-600 units we've tested with Windows 98. The system sports an 8X DVD-ROM drive (which played test movies smoothly and clearly) as well as a 4X/4X/24X CD-RW drive for an additional backup option.

WHAT'S NOT: You must remove four screws and take off the entire case to get inside; cables hinder access to the RAM slots and two open bays. The system lacks a printed manual, so the user must rely on the electronic one.



SECURITY FIRST: The Dell OptiPlex GX110 comes with chassis intrusion detection and a case lock.

WHAT ELSE: The electronic manual contains lots of information on troubleshooting and setup. Audiophiles will love the Altec Lansing ACS33 speaker set, which delivers crisp sound in concert with the Creative Sound Blaster Live card.

BEST USE: The Orion CXV works well as a stand-alone PC for general business use.

#### 10 NUTREND AMD K7-600

WHAT'S HOT: Multimedia goodies abound in the NuTrend AMD K7-600's configuration. The 8X DVD-ROM drive offers smooth software-decoded video playback, and the solidly constructed keyboard has programmable buttons. A large binder contains both the comprehensive, wellillustrated system documentation and the software bundle, which includes a copy of Corel WordPerfect Office 2000.

WHAT'S NOT: A score of 127 on our PC WorldBench 2000 tests was all the AMD K7-600 could manage—the lowest we've seen for similarly equipped systems running Windows 98.

WHAT ELSE: Colors appeared washed out on the 19-inch ADI GD-166G monitor, but text remained sharp up to the maximum resolution of 1600 by 1200. The ATI Rage 128 graphics card offers S-Video and composite outputs for sending PC signals to a television set. The roomy interior of the midsize tower has four open slots (three PCI and one ISA) and four open bays for expansion.

BEST USE: Despite the lackluster color display, this NuTrend's large monitor and DVD-ROM drive make it a choice presentation system.

### **How Processors Cache In**

TECH TREND PC VENDORS OFTEN LIST the amount of Level 2 (or secondary) cache their systems have, and they may state whether it is on-chip or discrete. (We also list the amount of L2 cache in our Top 10 PCs charts.) L2 cache-speedy memory that stores data likely to be needed by the CPU-is used to reduce the number of times the system must access its main memory. As noted, there are two flavors: on-chip and discrete.

On-chip is also called integrated, or on-die, cache. It resides on the same chip as the CPU. Discrete (nonintegrated) L2 cache resides close to the processor but on a separate chip.

The CPU can access integrated L2 cache faster than a nonintegrated one, enhancing performance. For example, according to Intel spokesperson Seth Walker, a PIII processor with

256KB of integrated L2 cache can be up to 10 percent faster than a PIII processor with 512KB of discrete L2 cache, given similar clock speeds. So why do some PCs use discrete cache? Space constraints on the chip holding the CPU are the rea-

son AMD's current Athlon processors use discrete cache, says company spokesperson Drew Prairie. AMD's newest Athlon processors are created with smaller transistors, making room for AMD's engineers to add more features to the chip, including L2 cache. Prairie says that with lower-speed processors, the speed dif-INTEGRATED ference between on-chip and discrete L2 cache isn't that noticeable. At higher speeds the benefit of integrated cache becomes more pronounced in a PC's performance; as CPU speeds increase, chip makers will be more likely to use it.

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## TOP 10 BUDGET PCs

	SYSTEM: UNDER \$1200	Month tested	★ Overall rating	Street price (4/14/00)	PC WorldBench 2000 performance score	Base configuration
1	Micro Express MicroFlex-600A 800/989-9900 www.microexpress.net	June 00	91	Average: \$1099	Outstanding 134	Outstanding: AMD Athlon-600, 128MB of SDRAM, 512KB L2 cache, 18GB hard drive, 17-inch monitor, Windows 98 SE
2	Axis Systems Terra MX10 800/378-9014 www.axissys.com	NEW	87	Inexpensive: \$929	Satisfactory 124	Very good: AMD K6-2-550, 128MB of SDRAM, 1MB L2 cache, 15GB hard drive, 17-inch monitor, Windows NT 4.0
3	IDot.com SA Series 600 888/388-4368 www.idot.com	NEW	86	Expensive: \$1169	Very good 125	Good: AMD Athlon-600, 64MB of SDRAM, 512KB L2 cache, 13.5GB hard drive, 17-inch monitor, Windows 98 SE
4	Quantex SB500c 800/896-4898 www.quantex.com	May 00	84	Inexpensive: \$899	Good 101	Good: Celeron-500, 64MB of SDRAM, 128KB L2 cache, 13.6GB hard drive, 17-inch monitor, Windows 98 SE
5	NuTrend Athlon Force 2 888/482-6678 www.nutrend.com	June 00	83	Expensive: \$1199	Outstanding 133	Very good: AMD Athlon-650, 128MB of SDRAM, 512KB L2 cache, 15GB hard drive, 17-inch monitor, Windows 98 SE
6	Quantex M650 800/896-4898 www.quantex.com	June 00	82	Average: \$1099	Very good 121	Good: Pentium III-650, 64MB of SDRAM, 256KB L2 cache, 15GB hard drive, 17-inch monitor, Windows 98 SE
7	Gateway GP6-466c 800/315-2536 www.gateway.com	NEW	82	Average: \$949	Satisfactory 99	Good: Celeron-466, 64MB of SDRAM, 128KB L2 cache, 10GB hard drive, 15-inch monitor, Windows 98 SE
8	AcerPower 4400 800/733-2237 www.acer.com	May 00	81	Expensive: \$1199	Very good 118	Good: Pentium III-600, 64MB of SDRAM, 512KB L2 cache, 13GB hard drive, 17-inch monitor, Windows 98 SE
9	Racer PC500c 800/843-8458 www.racerpc.com	May 00	78	Average: \$949	Good 102	Good: Celeron-500, 64MB of SDRAM, 128KB L2 cache, 8.4GB hard drive, 17-inch monitor, Windows 98 SE
10	Amax MicroPlex 5000 800/800-6328 www.amax.com	May 00	77	Average: \$999	Satisfactory 96	Good: Celeron-533, 64MB of SDRAM, 128KB L2 cache, 10.2GB 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 179.



HALF THE SYSTEMS on this month's chart cost less than \$1000, including new entries from Axis Systems and Gateway. And if you want faster computing power in your

budget PC, check out the pricier machines on our chart—several, like the new IDot.com SA Series 600, pack CPUs of 600 MHz or higher.

#### MICRO EXPRESS MICROFLEX-600A



WHAT'S HOT: Its Athlon-600 processor propelled the MicroFlex-600A to an outstanding score of

134 on our PC WorldBench 2000 tests, higher than any other machine on the budget chart. For users concerned with ergonomics, a Microsoft Natural Keyboard permits comfortable, quiet typing. Inside the midsize tower, we found an uncluttered interior with three open PCI slots and four open bays for lots of expansion. The MicroFlex-600A also has the largest hard drive on the chart, a generous 18GB. WHAT'S NOT: This well-rounded system is hard to knock, though business users might wish for a network card instead of a modem for connectivity. Also, be careful where you click: At last check, Micro Express had priced this system at more than \$1700 on its Web site; you must call the company to get the \$1099 price.

WHAT ELSE: A well-organized system manual provides lots of information, including a detailed glossary, but the blurred images look like photocopies. Colors on the 17-inch Impression 7VX monitor appear deep and rich, and text remains crisp except at the highest resolution of 1600 by 1200. The ATI Rage Fury graphics card offers S-Video and composite output-boons for presenters. The 6X DVD-ROM drive is a pleasant surprise at this unit's bargain price.

BEST USE: This is an excellent generaluse system for a small office seeking performance on a budget.

#### 2 AXIS SYSTEMS TERRA MX10



WHAT'S HOT: For \$929, the Terra MX10 won't dig too deep a hole in your pocket. The PC ships with a

NEW detailed system manual, which includes helpful troubleshooting and upgrading information, as well as thorough documentation for system components. The fairly neat interior of the midsize tower offers substantial room for expansion: four open slots (three PCI and one ISA) and four open bays (one internal and three at the front of the case); however, access to the internal bay is somewhat

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: ATI Rage Fury graphics card with 32MB of RAM, 6X DVD-ROM drive, V.90 modem, hardware MPEG, Norton AntiVirus, Microsoft Natural Keyboard	Very good: easy motherboard access; mid- size tower; 4 open drive bays, 3 open slots		Fair '/ Outstanding	24/7, toll-free	4/4
Good: Creative TNT2 Pro graphics card with 32MB of RAM, 40X-52X CD-ROM drive, V.90 modem, Microsoft IntelliMouse	Very good: easy-to-remove case; midsize tower; 4 open drive bays, 4 open slots	3	Good 3/ Outstanding	24/7, toll-free	5/3
Good: NVidia TNT2 graphics card with 16MB of RAM, 17X-48X CD-ROM drive, network card, McAfee VirusScan	Good: cramped interior; midsize tower; 3 open drive bays, 4 open slots		Good 3/ Good	24/7, toli-free	1/3
Good: integrated Intel 810 graphics with UMA, 24X-48X CD-ROM drive, V.90 modem, network card, Corel WordPerfect Office 2000	Good: removing side panel takes fiddling; midsize tower; 4 open drive bays, 1 open slot	Fair <sup>3</sup>	Fair ³/ Good	24/7, toll-free	3/1
Good: ATI Rage 128 graphics card with 16MB of RAM, 8X DVD-ROM drive, V.90 modem, Corel WordPerfect Office 2000	Good: neat interior; midsize tower; 4 open drive bays, 4 open slots	rai b	Fair <sup>3</sup> / Good	24/7, toll-free	3/Lifetime
Good: integrated Intel 810 graphics with UMA, 12X DVD-ROM drive, V.90 modem, Corel WordPerfect Office 2000	Good: programmable keyboard buttons; mid- size tower; 4 open drive bays, 2 open slots	Fair <sup>3</sup>	Fair ³/ Good	24/7, toll-free	3/1
Good: integrated Intel 810 graphics with UMA, 17X-40X CD-ROM drive, network card, dicrosoft Office 2000 Small Business Edition, Norton AntiVirus	Satisfactory: cluttered interior; minitower; 1 open drive bay, 3 open slots	Good	Fair/ Outstanding	24/7, toll-free	3/3
Good: Acer NYidia TNT2 graphics card with 16MB of RAM, 12X-40X CD-ROM drive, network card, chassis intrusion detection, case lock, LANDesk Client Manager, Wake on LAN	Good: RAM slots hard to access; desktop; 3 open drive bays, 2 open slots	Poor 3	Fair ³/ Good	24/7, toll-free	3/3
Satisfactory: Integrated Intel 810 graphics with UMA, 4.8X DVD-ROM drive, V.90 modem	Good: side handles on case; minitower; 1 open drive bay, 3 open slots		Good 3/ Good	24/7, toll-free	Varies */3
Good: integrated Intel 810 graphics with UMA and 4MB of display cache, 8X DVD-ROM drive, network card	Good: well-kept interior; minitower; 2 open drive bays, no open slots	,	Poor 3/ Good	24/7, toli-free	3/1
Extra features: 10 percent	Design and expandability: 15 percent	Reliability: 15 percent	Support a	nd warranty: 15	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.



FOR WINDOWS NT LOVERS: The Axis Systems Terra MX10 has a low price and a 15GB hard drive.

impeded by the CPU. The 17-inch Axis 700EX monitor produces rich colors and crisp text, with only slight blurring at its maximum resolution of 1280 by 1024.

WHAT'S NOT: Based on an AMD K6-2-550 CPU, this system earned a score of 124 on our PC WorldBench 2000 tests. Although that's not bad for a budget system, it is the lowest posted by any Windows NT system we've tested (including a Celeron-500 machine with only 64MB of RAM).

WHAT ELSE: To get inside the midsize case, you must remove four screws that are easily lost; reattaching the case takes some wiggling. The generic keyboard includes a detachable wrist rest, but getting the keys to register requires too much pressure. Welllabeled rear ports ease setup.

BEST USE: Most NT users will need more power than this sys-

tem provides, but with its sub-\$1000 price, the Terra MX10 should suit those with cost constraints and no prejudice against slightly slower processors.

#### 3 IDOT.COM SA SERIES 600

NEW WHAT'S HOT: This basic midsize tower makes a smooth transition from

box to desk, thanks to color-coordinated rear ports and a detailed setup poster. In addition, IDot.com's spiral-bound manual contains excellent troubleshooting information and documentation for most components. Expandability abounds with four open slots (three PCI and one ISA) and three open drive bays in the neat but cramped interior.

WHAT'S NOT: Text on the 17-inch Leoptics Comfortview monitor looks slightly fuzzy at a standard resolution of 1024 by 768, and colors appear dull. Typing on the somewhat flimsy keyboard feels smooth but causes loud clacking.

WHAT ELSE: With an Athlon-600 CPU and running Windows 98, the SA Series 600 earned a PC WorldBench 2000 score of 125-low compared with those of similarly configured Athlon-600 systems we've tested. For \$1169, the PC comes network ready and includes a 13.5GB hard drive. Fastened by one thumbscrew,

One-year warranty on screen, mouse, and keyboard; three years on other parts.

the side of the case is easy to remove, but reattaching it can be difficult.

BEST USE: This PC would be at home in a networked small office that's keeping an eye on the bottom line.

#### 4 QUANTEX SB500C

WHAT'S HOT: Packing both a modem and a network interface card, the Quantex SB500c is ready for any kind of connectivity-and at \$899, it delivers pretty good pop for your penny. Quantex's 17-inch MON-XP170DP monitor displayed our test images with deep, rich colors, and text stayed sharp up to the maximum resolution of 1280 by 1024. If that's not good enough, the SB500c-unlike most systems with integrated graphics-offers an AGP slot for upgrading.

WHAT'S NOT: To lift the flimsy side panel of the midsize tower, you must remove two screws and wiggle it back and forth. The cluttered interior offers limited expandability: It holds four open bays but only one open slot (PCI).

WHAT ELSE: The Quantex SB500c's performance score of 101 on our PC World-Bench 2000 tests is about average for the Celeron-500 systems we've tested. The keyboard is large and solid and has extra multimedia keys, but it clacks a bit as you type; spend an extra \$29 to upgrade to the Microsoft Natural Elite keyboard. Documentation includes a slim system manual filled with illustrations, as well as a Windows 98 setup guide.

BEST USE: A strong performer for the price, this Quantex would suit almost any small business on a tight budget.



READY TO WORK: The Gateway GP6-466c ships with Microsoft Office 2000 Small Business Edition.

#### 5 NUTREND ATHLON FORCE 2

WHAT'S HOT: The Athlon Force 2 is an upgrader's dream. To access its orderly interior, you simply remove one screw on the midsize tower's top and slide out the side panel. Inside, you'll find lots of room for expansion-there are four open slots and four open bays. A large, well-organized, and colorful binder contains copious documentation and bundled software

(including Corel's WordPerfect Office 2000 suite). Users will also appreciate the system's well-labeled exterior.

WHAT'S NOT: You'll want to get a better display if you buy the Force 2: Colors on the 17-inch Optiquest Q71 monitor appear diluted, and text is unreadable at the maximum resolution of 1280 by 1024. At \$1199, this system is at the upper end of our budget range.

WHAT ELSE: The Force 2's score of 133 on our PC WorldBench 2000 tests matched the average for similarly configured Athlon-650s we've tested. Reset and sleep buttons are located conveniently on the front of the case, and ports are color-coded and labeled for easy setup.

BEST USE: The Athlon Force 2's handy midrange features and outstanding performance shouldn't disappoint small- and home-office users-though we recommend purchasing a better monitor.

#### 6 QUANTEX M650

WHAT'S HOT: With its icon-labeled. color-coordinated rear ports and its helpful quick-setup guide, the Quantex M650 comes together easily. For future CPU upgraders, the midsize tower's motherboard accommodates both Slot 1 and Socket 370 processors, supporting a broader range of upgrade choices. The programmable buttons-including volume and DVD-ROM player controls-should come in handy on the comfortable, solidly constructed keyboard.



WHAT'S NOT: Though the Quantex M650 is quick for a budget system, its score of 121 on our PC WorldBench 2000 tests was significantly short of those posted by most other similarly configured Pentium III-650 units we've tested. This lag is due in part to the machine's use of integrated graphics, which draw from the system's 64MB of RAM.

WHAT ELSE: Colors on the Quantex DP1727 17-inch monitor look rich, but text is blurry at the standard resolution of 1024 by 768 and almost unreadable at the maximum of 1280 by 1024. The system's two open PCI slots and four open bays provide adequate expansion room.

BEST USE: The M650 would make a capable addition to any small office, though heavy word processing users may want to spring for a sharper monitor.

#### 7 GATEWAY GP6-466C

NEW WHAT'S HOT: The large system manual offers excellent troubleshooting and upgrading information, bolstered by plenty of color illustrations. A network interface card and Microsoft Office 2000 Small Business Edition are nice extras at the unit's low price of \$949. A PC World-Bench 2000 score of 99 is above the average for similarly configured Celeron-466 systems running Windows 98.

WHAT'S NOT: It's still a Celeron-466, which is slow even for the budget chart. Couple that with the small (15-inch) Gateway EV500 monitor, and you've got a notbad system-from last year.

WHAT ELSE: To access the interior of this standard minitower, you must remove five easy-to-lose screws, then pull the entire case off. The inside is crowded with wires and cables; together with the power supply, they hinder access to the single open drive bay. (However, access is clear around the three open PCI slots.)

BEST USE: This Gateway would make an inexpensive networked system for users who don't need a powerhouse.

#### 8 ACERPOWER 4400

WHAT'S HOT: Tons of illustrations and excellent upgrading information fill the system manual. The desktop includes a case lock and a cover that slides off easily. It also comes with Wake on LAN and chassis intrusion detection, as well as Intel's LANDesk Client Manager on disc. WHAT'S NOT: The added features collide-literally. We had trouble reattaching the case cover because it didn't quite line up with the lock. Reaching an internal drive bay requires removing a metal panel secured by an easily lost screw.

WHAT ELSE: The AcerPower 4400 earned a PC WorldBench 2000 score of 118-a tad below average for PIII-600 systems that we've tested (though still pretty fast for a budget unit), due in part to its modest 64MB of RAM. Within its spacesaving case, the AcerPower provides two open slots and three open bays. Advent's AV120 two-speaker set attaches to the sides of the monitor; the speakers are easy to set up but deliver mediocre sound.

BEST USE: With its slim desktop design and useful management features, the \$1199 AcerPower 4400 would make a capable corporate computer for users who are trying to save desk space and a few bucks.

#### 9 RACER PC500C

WHAT'S HOT: At \$949, the Racer

PC500c is one of the lowest-priced systems on our budget chart. A unique minitower design with side handles makes accessing its innards easy. Service from the company's technical support representatives earned a rating of Good in our anonymous calls.

WHAT'S NOT: Colors appear washed out on the system's 17-inch ADI VD-697 monitor. Playback on the 4.8X DVD-ROM drive was poor, primarily because of the substandard display.

WHAT ELSE: This Racer's PC WorldBench 2000 score of 102 ranks slightly above average for Celeron-500 systems running



POWER ON A BUDGET: The Racer PC500c offers pretty nice speed for a pretty nice price-\$949.

Windows 98. The unit comes with documentation for all components, but no overall system manual. The neat interior supports limited expansion-three open PCI slots but only one free drive bay.

BEST USE: Providing solid power at a low price, the Racer would work well for people who don't demand topflight multimedia performance.

#### 10 AMAX MICROPLEX 5000

WHAT'S HOT: System documentation comes in a neat box, with a holder that slides out and dividers that separate all the manuals, including a system manual notable for detailed troubleshooting information. Even at just \$999, this Amax carries several extras, such as an 8X DVD-ROM drive and a network card.

WHAT'S NOT: On our test unit, the DVD-ROM drive played our movie sporadically (the image flickered in and out, and sometimes the player didn't work at all) until tech support instructed us to move the MPEG card to a different PCI slot. The MicroPlex 5000 has a Celeron-533 processor, but its PC WorldBench 2000 score of 96 ranks below those posted by most other Celeron-500 models we've tested.

WHAT ELSE: Although it has a tidy interior, the Amax includes only two open bays and no open slots. The 17-inch Impression 7VX monitor displays sharp text, but colors appear a bit washed out.

BEST USE: With its built-in network card and low price, this Amax represents an excellent cost-cutter for companies that don't need extreme speed.

## Are Serial Ports on Their Way Out?

TECH TREND MANY NEW PCs shipping from major vendors supply only one serial port for connecting peripheral devices such as modems and digital cameras. Is the serial port being phased out in favor of the faster Universal Serial Bus?

Willy Hsu, a spokesperson for Axis Systems, says that very few of Axis's customers are using new serial devices or require more than one serial port. (Thus the Axis Terra AXD, number two on the Top 10 Power PCs chart, has only one serial port.) "As far as we're concerned, we could do without [serial ports]," says Hsu.

The Legacy Free version of Compag's new IPag desktop PC does away with serial ports altogether, shipping instead with five USB ports. And the standard version of the IPag includes just one serial port. "We've heard from our customers that there are a number of technologies...including [serial] ports on the back of the PC, that they were not using," explains Michael Takemura, worldwide marketing manager for the IPag line.

Most vendors still offer two serial ports but say one port may soon be all you need. "Currently we still feel that there is a need for both [serial ports]," says Patrick Kimball, a spokesperson for Micron. "As the popularity of USB increases, we'll certainly reevaluate the need for two serial ports."



# TOP 15 NOTEBOOK PCs

Ø	POWER NOTEBOOK: \$2700 AND OVER	Month tested	Overall rating	Street price (4/17/00)	PC WorldBench 2000 performance score	Base configuration
1	Gateway Solo 9300LS 800/846-2000 www.gateway.com	June 00	89	Average: \$3123	Good 119	Very good: Pentium III-650/500, 15-Inch active screen, touchpad, 64MB of SDRAM, 6GB hard drive
2	Micron TransPort ZX 800/642-7667 www.micronpc.com	NEW	88	Inexpensive: \$2749	Good 116	Very good: Pentium III-600/500, 14.1-inch active screen, touchpad, 64MB of SDRAM, 12GB hard drive
3	Acer TravelMate 732TLV 800/733-2237 www.acer.com/aac	May 00	87	Inexpensive: \$2799	Good 120	Very good: Pentium III-500, 15-inch active screen, touch- pad, 128MB of SDRAM, 9GB hard drive
4	Dell Latitude CPx H500GT 800/388-8542 www.dell.com	May 00	84	Average: \$3018	Satisfactory 114	Good: Pentium III-500, 14.1-inch active screen, touchpad, eraserhead, 128MB of SDRAM, 6.4GB hard drive
5	Compaq Prosignia 190 800/345-1518 www.compaq.com	NEW	84	Expensive: \$3250	Outstanding 130	Outstanding: Pentium III-650/500, 15-inch active screen, touchpad, 128MB of SDRAM, 12GB hard drive
	MIDRANGE NOTEBOOK: \$2000 TO \$2699	Percent of over	rall rating 🕨	Price: 14 percent	Performance: 20 percent	Base configuration: 5 percent
1	Dell Inspiron 3800 C500 GT 800/388-8542 www.dell.com	June 00	82	Very inexpensive: \$2026	Good 101	Good: Celeron-500, 14.1-inch active screen, touchpad, eraserhead, 64MB of SDRAM, 6GB hard drive
2	Acer TravelMate 730TXV 800/733-2237 www.acer.com	NEW	79	Average: \$2299	Good 104	<b>Very good:</b> Pentium III-450, 14.1-inch active screen, touck pad, 64MB of SDRAM, 6.4GB hard drive
3	HP Pavilion N3290 800/322-8949 www.hp.com/notebooks	May 00	79	Inexpensive: \$2199	Good 109	Good: Pentium III-500, 14.1-inch active screen, touchpad, 64MB of SDRAM, 6GB hard drive
4	IBM ThinkPad i Series 1492 800/426-7255 ext. 4751 www.lbm.com/pc/us/thinkpad	NEW	79	Expensive: \$2699	Very good 120	Outstanding: Pentium III-500, 15-inch active screen, eraserhead, 128MB of SDRAM, 12GB hard drive
5	Enpower ENP-314@P3 800/997-2258 www.enpower.com	June 00	77	Inexpensive: \$2199	Very good 121	<b>Very good:</b> Pentium III-550, 14.1-inch active screen, touch pad, 128MB of SDRAM, 6GB hard drive
	BUDGET NOTEBOOK: UNDER \$2000	Percent of over	rall rating >	Price: 17 percent	Performance: 17 percent	Base configuration: 5 percent
1	Micron TransPort LT C500 800/642-7667 www.micronpc.com	June 00	84	Expensive: \$1999	Very good 99	Good: Celeron-500, 12.1-inch active screen, touchpad, 64MB of SDRAM, 6GB hard drive
2	Compaq Notebook 100 800/345-1518 www.compaq.com	June 00	83	Inexpensive: \$1499	Good 85	Satisfactory: AMD K6-2-475, 12.1-inch active screen, touchpad, 64MB of SDRAM, 5GB hard drive
3	Acer TravelMate 340T 800/733-2237 www.acer.com	NEW	82	Expensive: \$1999	Very good 97	Good: Pentium III-450, 12.1-inch active screen, touchpad, 64MB of SDRAM, 6.4GB hard drive
4	Chem USA ChemBook 2000 800/866-2436 www.chemusa.com	June 00	80	Very inexpensive: \$1149	Satisfactory 80	Satisfactory: AMD K6-2-450, 13-inch dual-scan screen, touchpad, 64MB of SDRAM, 4.3GB hard drive
5	Twinhead Powerslim 600 800/995-8946 www.twinhead.com	May 00	76	Expensive: \$1820	Good 89	Good: Pentium II-366, 12.1-inch active screen, touchpad, 64MB of SDRAM, 6.4GB hard drive
	Best Buy	ercent of over	rall rating >	Price: 20 percent	Performance: 14 percent	Base configuration: 5 percent

Unless otherwise noted, all notebooks come with a lithium ion battery.

Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.

<sup>3</sup> Due to insufficient data from survey, score is based on responses to anonymous calls for tech support.

\* Five years on CPU and main memory, one year on other parts.



PRESTO, CHANGE-O: Last month's budget and midrange Best Buys have switched places-a tricky feat. A price increase kicks Dell's Inspiron 3800 C500 GT, June's budget

Best Buy, upstairs to the midrange chart. At \$2026 it costs \$98 more but remains a sweet deal. The June midrange champ, Micron's \$1999 TransPort LT C500, sheds \$100 to become our new budget winner. Gateway's Solo 9300LS still rules the power list after a \$201 price drop.

#### 1 GATEWAY SOLO 9300LS



WHAT'S HOT: This big, sophisticated desktop replacement offers a lot in return for a sizable outlay

of cash. Battery life, closing in on 5 hours, is the longest of any notebook on our list. Two modular bays let you choose what to take along: Instead of the LS-120 drive

Extra features '	Design and ease of use	Battery life (hours:min)	Travel weight (pounds) <sup>2</sup>	Vendor's system reliability	Tech support quality/ policies	Tech support (hours/days, charge)	Warranty for parts/labor (years)
Excellent: 10X-24X CD-ROM drive, V.90 modem, LS-120 drive, Microsoft Office 2000 Small Business Edition	Outstanding: 4:46	Average: 8.6	Good	Fair/ Good	24/7, toll-free	3/3	
Good: 6X DVD-ROM drive, V.90 modem, single multipurpose bay, Microsoft Office 2000 Small Business Edition	Very good: soft faux-leather casing; sliding window in cover reveals docking connection	Good: 3:18	Average: 7.6	Good	Good '/ Fair	24/7, toll-free	Varies */1
Excellent: 6X DVD-ROM drive, V.90 modem, single multi- purpose bay, network port	Average: TimeMachine utility restores system's original settings	Very good: 4:31	Average: 7.9	Fair	Good 3/ Fair	24/7, toll-free	1/1
Satisfactory: 4X/4X/24X CD-RW drive, single multipur- pose bay	Excellent: highly configurable, but mouse buttons a tad uncomfortable	Very good: 4:02	Average: 8.3	Good	Good/ Outstanding	24/7, toll-free	3/3
Excellent: 4X DVD-ROM drive, V.90 modem, dual multipur- pose bays, Microsoft Office 2000 Professional Edition	Excellent: holds up to three batteries at once; four programmable keyboard buttons	Good: 3:29	Average: 8,1	Fair	Fair/ Good	24/7, toll-free	3/1
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	percent
Good: 10X-24X CD-ROM drive, V.90 modem, single multipurpose bay, Microsoft Works 2000	rgle Excellent: thinnish, flexible business laptop comes in different colors; easily upgradable 1:58 7.8 Good Good			24/7, toll-free	1/1		
Very good: 6X DVD-ROM drive, V.90 modem, single multipurpose bay, Microsoft Works 2000	<b>Very good:</b> network-ready, can attach optional USB camera; programmable mouse buttons	Very good: 4:15	Average: 7.8	Fair	Good <sup>3</sup> / Fair	24/7, toll-free	1/1
Good: 6X DVD-ROM drive, V.90 modem, Microsoft Works 2000	Good: you can listen to CDs without turning notebook on; keyboard is comfortable, quiet	Satisfactory: 2:52	Average: 7.8	Good	Good 3/ Poor	24/7, toll call	1/1
Good: 6X DVD-ROM drive, V.90 modem, Lotus SmartSuite	Very good: LED illuminates keyboard for typing in the dark; colorful \$29 screen covers	Very good: 4:00	Average: 8,4	Good	Good/ Fair	24/7, toll-free	1/1
Satisfactory: 6X DVD-ROM drive, V.90 modem	Average: external charge indicator lets you check battery life; no audio niceties	Satisfactory: 2:57	Average: 8.2	•	Good '/ Fair	Varies *, 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	percent
<b>Very good:</b> 10X-24X CD-ROM drive, V.90 modem, single multipurpose bay, Office 2000 Small Business Edition	Average: lightweight travel laptop can use \$20 USB floppy drive; mouse buttons programmable	Satisfactory: 2:32	Light: 6.7	Good	Good 3/ Fair	24/7, toll-free	Varies */1
Limited: 12X-24X CD-ROM drive, V.90 modem, NiMH battery, Microsoft Works 2000	<b>Poor:</b> no standard docking station port, but vendor sells USB legacy hub	Satisfactory: 2:36	Average: 7.4	Fair	Fair/ Fair	24/7, toll-free	1/1
Satisfactory: 10X-24X CD-ROM drive, V.90 modem, Microsoft Works 2000	Average: screen frame notches hold clip-on video camera; no docking connection	Satisfactory: 2:09	Average: 6.9	Fair	Good <sup>3</sup> / Fair	24/7, toll-free	1/1
Limited: 12X-24X CD-ROM drive, K56flex modem, NiMH battery	<b>Average:</b> has okay dual-scan screen; memory is moderately easy to reach for upgrading	Satisfactory: 2:15	Average: 8.0	,	Good '/ Fair	24/7, toll call	1/3
Good: 10X-24X CD-ROM drive, V.90 modem, single multipurpose bay	Average: light subnotebook offers no docking station	Satisfactory: 2:05	Very light: 5.3		Good 1/ Poor	12/5, 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	percent

Insufficient data to give a rating.

\* 10 hours of tech support on weekdays, 4 hours on weekends.

that our test unit came with, you can swap in a second hard drive or a second battery; or swap out the CD-ROM drive for either a DVD-ROM or CD-RW drive.

WHAT'S NOT: Even though the 9300LS clings to the top spot by trimming \$201 from its price, at \$3123 it's not for bargain hunters. And at 6GB, the hard drive is a bit lean for a top-of-the-line notebook.

WHAT ELSE: Besides a big, beautiful 15-

inch screen, the 9300LS bristles with audio and video extras, including a TV-out port and a Dolby jack for connecting a surround-sound stereo system. External buttons make playing music CDs more convenient, and four programmable shortcut buttons at the top of the keyboard can launch applications. A charge indicator lets you check on remaining juice without removing the battery first. The speedy



9300LS performed a little faster than the similarly configured Micron TransPort ZX, new to the power chart this month. BEST USE: Presenters with deep pockets will love this beautifully designed notebook. With a second battery inserted, it should let you work unplugged all day.

#### IDRANGE NOTEBOOKS

#### 1 DELL INSPIRON 3800 C500 GT



WHAT'S HOT: This midrange business laptop is a head turner. The upper casing and screen frame

come dressed in a choice of colors: forest green, sierra maroon, Tahoe blue, or standard matte gray. The internal bay can hold any one of seven devices (the floppy drive, the CD-ROM drive, a second battery for \$99 extra, a Zip drive for \$139, an LS-120 drive for \$139, an 8X DVD-ROM drive for \$199, or an 18GB hard drive for \$598), or an included plastic space holder.

WHAT'S NOT: Dell notebooks usually offer good battery life, but this Inspiron lasted just under 2 hours in our tests-about an hour less than the average laptop.

WHAT ELSE: This Celeron-500 version of the Inspiron 3800 churned through our business apps about 7 percent faster than an average Celeron-466. The hard drive and memory are easily reachable for upgrading. A nice perk is a video-out jack for sending images to a TV screen.

BEST USE: With its refreshing good looks, the Inspiron 3800 C500 GT is a fine value for companies that are ready to break out of the boxy black laptop mold.



the Acer TravelMate 340T's screen let you attach an optional USB video camera or colorful screen covers.

#### BUDGET NOTEBOOKS

#### MICRON TRANSPORT LT C500



WHAT'S HOT: The TransPort LT weighs only 5 pounds, minus adapter and accessories. Five de-

vices can plug into its internal bay: the floppy drive, the CD-ROM drive, a \$190 6X DVD-ROM drive, a \$139 LS-120 drive, or a \$99 second battery. To use the floppy drive with another device already in the

bay, Micron sells a \$20 USB floppy drive caddy, which you can connect without rebooting.

WHAT'S NOT: If you need to run diagnostics or recover your system via a bootable floppy disk, you'll have to use the internal bay-you cannot boot from floppies through the USB port.

WHAT ELSE: Given the TransPort LT's size and processor, its speed and 2.5-hour battery life generally met our expectations. The keyboard feels a bit shallow but lets you launch apps from the mouse buttons or a programmable key just to the right of the spacebar. A single PC Card

slot is included, but the modem is built in. BEST USE: This is a good business laptop for frequent travelers willing to sacrifice screen and hard drive size for portability.

### What's New

THIS MONTH OUR Top 15 chart reflects the results from our latest reliability and

> service survey, in which almost 16,000 PC World readers told us about problems they had with their computers and evaluated how well their vendor solved those problems. The winners? Dell and IBM tie for top notebook honors, each earning overall ratings of Good in both reliability and service. Meanwhile, Gateway and Toshiba match the leaders in reliability, but earn only Fair for service. And Compaq brings up the rear with Fair ratings in both categories. Unfortunately, no com

pany this year managed to get a rating of Outstanding. For the complete story on this exclusive survey, see page 114.

#### HERE TODAY, GONE TODAY

LATE IN THE EDITORIAL process, Compag notified us that it will discontinue the Prosignia 190-one of five new notebooks on the chart this month-at the end of June. After June, it will most likely be replaced by a model in Compaq's



IBM ThinkPad i Series 1492's screen can illuminate the keyboard so you can work during a late-night flight.

Armada line, but it might remain available through some channels for a while.

Too bad. We were impressed by the Prosignia 190's capacity for long battery life, achieved by stuffing, not just two, but three batteries into its case. How was that feat accomplished? Besides the built-in battery, two extra batteries (a \$179 12-cell and \$129 8-cell) can fit into the Prosignia's modular CD-ROM drive and floppy drive bays. The trio of power packs runs for up to 9 hours, says Compaq.

Contributing Editor Carla Thornton regularly covers notebooks for PC World.

#### ALSO NEW THIS MONTH



We evaluated the following notebooks along with the others, but they didn't reach the Top 15

Notebook PCs chart. For write-ups, visit PCWorld.com (www.pcworld.com/top400).

- Axis Fusion 7260A
- Axis Fusion 8160
- ◆ Toshiba Tecra 8100

## With CTX Professional PureFlat Monitors, There's No Question About



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... because with Sony FD Trinitron® CRT technology, CTX PureFlat monitors have the flattest faces in the industry - edge to edge. Sony FD Trinitron® CRTs offer the best design and most advanced electron gun technology, giving CTX PureFlat monitors optimal flatness, ultra-high contrast, higher resolution, and tighter AG pitch than the competition. This means giving you the best picture possible - realistic images with virtually no distortion, reflected glare, or eye strain. You get a flawless picture every time with CTX Professional PureFlat monitors! And CTX is the first to offer a complete line of monitors incorporating Sony FD Trinitron® CRT technology, from 15" (14" VIS) to 21" (19.8" VIS), all with max. refresh rates of 160Hz. Most models are equipped with standard built-in 4+1 USB power bubs for quick and easy connection of over 100 USB peripherals, such as keyboard, mouse, speakers, and printer. CTX PureFlat monitors - recognized around the world for high-quality display performance and great value.



- 0.24 0.25mm aperture pitch
- Sony FD Trinitron® CRT technology
- · 4 + 1 USB power hub\*
- . BNC connectors\*
- TCO99
- 3-year parts, labor & CRT warranty











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# CWORLD

## TOP 15 HOME PCs

	POWER SYSTEM: \$2000 AND OVER	Month tested	★ Overall rating	Street price (4/14/00)	PC WorldBench 2000 performance score 1	Base configuration ?
1	Dell Dimension XPS B733r 800/388-8542 www.dell.com	June 00	96	Expensive: \$2589	Very good 146	Very good: Pentium III-733, 128MB of RDRAM, 256KB L2 cache, 20GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
2	Micron Millennia Max 733 800/642-7667 www.micronpc.com	NEW	91	Inexpensive: \$2199	Outstanding 150	Very good: Pentium III-733, 128MB of SDRAM, 256KB L2 cache, 20.5GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
3	Gateway Select 850 800/315-2536 www.gateway.com	June 00	89_	Average: \$2429	Outstanding 150	Very good: AMD Athlon-850, 128MB of SDRAM, 512KB L2 cache, 27.3GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
4	HP Pavilion 9690c PC 800/752-0900 www.hp-at-home.com	May 00	88	Very expensive: \$2798	Very good 147	Good: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache, 400 hard drive, midsize tower, 17-inch monitor, Windows 98 SE
5	Quantex GX800 800/896-4898 www.quantex.com	June 00	88	Average: \$2299	Very good 147	Very good: Pentium III-800EB, 128MB of SDRAM, 256KB L2 cache 30.7GB hard drive, midsize tower, 19-inch monitor, Windows 98 St
	MIDRANGE SYSTEM: \$1200 TO \$1999	Percent of overa	II rating >	Price: 5 percent	Performance: 15 percent	Base configuration: 10 percent
1	Dell Dimension XPS T600r 600/388-8542 www.dell.com	June 00	94	Expensive: \$1849	Very good 1136	Very good: Pentium III-600E, 128MB of SDRAM, 256KB L2 cache, 10.2GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
2	Quantex GX700 800/896-4898 www.quantex.com	Mar 00	92	Expensive: \$1879	Outstanding 143	Outstanding: Pentium III-700, 128MB of SDRAM, 256KB L2 cache 29GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
3	Micron Millennia Max 533 800/642-7667 www.micronpc.com	Feb 00	91	Inexpensive: \$1425	Good 130	Good: Pentium III-533B, 128MB of SDRAM, 512KB L2 cache, 13.7G hard drive, midsize tower, 17-inch monitor, Windows 98 SE
4	CyberMax ValueMax 700 800/437-4596 www.cybermaxpc.com	NEW	91	Very Inexpensive: \$1249	Outstanding 140	Good: AMD Athlon-700, 128MB of SDRAM, 512KB L2 cache, 15.4GE hard drive, midsize tower, 17-inch monitor, Windows 98 SE
5	ABS Multimedia System 1 800/876-8088 www.buyabs.com	May 00	87	Expensive: \$1849	Outstanding 139	Outstanding: AMD Athlon-700, 256MB of SDRAM, 512KB L2 cache 27GB hard drive, midsize tower, 19-inch monitor, Windows 98 SE
	BUDGET SYSTEM: UNDER \$1200	Percent of overa	II rating >	Price: 15 percent	Performance: 10 percent	Base configuration: 10 percent
1	Quantex M650 800/896-4898 www.quantex.com	May 00	83	Average: \$1099	Outstanding 132	Good: Pentium III-650, 128MB of SDRAM, 256KB L2 cache, 20.5Gl hard drive, minitower, 17-inch monitor, Windows 98 SE
2	Gateway Astro 800/315-2536 www.gateway.com	May 00	83	Very inexpensive: \$799	Satisfactory 92	Satisfactory: Celeron-400, 64MB of SDRAM, 128KB L2 cache, 4.3GB hard drive, all-in-one, 15-inch monitor, Windows 98 SE
3	CyberMax Enthusiast 500 CBG 800/437-4596 www.cybermaxpc.com	May 00	81	Average: \$949	Good 107	Very good: Celeron-500, 128MB of SDRAM, 128KB L2 cache, 13GE hard drive, midsize tower, 17-inch monitor, Windows 98 SE
4	NuTrend Maestro GE 888/482-6678 www.nutrend.com	May 00	79	Inexpensive: \$899	Satisfactory 100	Good: Celeron-500, 64MB of SDRAM, 128KB L2 cache, 8GB hard drive, midsize tower, 17-inch monitor, Windows 98 SE
5	Compaq Presario EZ2200 800/345-1518 www.compaq.com	May 00	76	Expensive: \$1198	Satisfactory 97	Good: Celeron-500, 64MB of SDRAM, 128KB L2 cache, 17.3GB hardrive, 17-inch monitor, Windows 98 SE
	Best Buy	Percent of overa	Il rating >	Price: 20 percent	Performance: 10 percent	Base configuration: 5 percent

<sup>&#</sup>x27;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 179.

TWO SECTIONS OF THE Top 15 accept new entrants this month, while price drops shake things up even more. Dell Dimension systems continue to dominate the power and midrange divisions, but the budget chart has a new leader. The Quantex M650 earns a spot at number one with a \$250 price cut from last month that shifts it from the midrange to the budget level.

#### POWER HOME PCS

#### 1 DELL DIMENSION XPS B733R



**WHAT'S HOT:** The Dell Dimension XPS B<sub>733</sub>r retains its top spot on the power chart with a

price drop of \$410. This impressive system packs plenty of processing power and lots of extra features. Its Pentium III-733

Extra features	Setup/ ease of use	Graphics	Reliability/ support	Comments
Very good: Celestica graphics board with 64MB of DDR SDRAM, 12X DVD- ROM drive, V.90/DSL modem, lomega Zip 100 drive	Outstanding/ Good	Very good	Outstanding/ Good	PRO: Dropped in price \$410; fast in games, booming sound system.  CON: Second most expensive on chart even with price drop.
<b>/ery good:</b> NYidia NY990 graphics board with 32MB of DDR SGRAM, 2X DVD-ROM drive, 4X/8X/24X CD-RW, V.90 modem	Outstanding/ Good	Very good	Good/ Fair	PRO: Good graphics quality, least expensive system on chart. CON: DVD movies are too dark and player lacks brightness settings.
iood: Creative 3D Blaster Annihilator graphics board with 32MB of DRAM, 10X DVD-ROM drive, V.90 modem	Outstanding/ Very good	Very good	Fair/ Fair	PRO: Tied for fastest PC on the chart, highly expandable. COM: Short on extra features.
outstanding: Asus AGP-Y3800 graphics board with 16MB of SDRAM, 8X VD-ROM drive, Y.90/DSL modem, ethernet card, 4X/2X/20X CD-RW drive	Outstanding/ Very good	Good	Fair/ Fair	PRO: Fast; large-capacity hard drive, high-speed Internet connectivity. COM: Pricey; limited expansion slots.
Yery good: Guillemot 3D Prophet graphics board with 32MB of SDRAM, 2X DVD-ROM drive, V.90 modem, 4X/2X/24X CD-RW drive	Very good/ Satisfactory	Good	Fair/ Fair	PRO: Great value, fast all-around performance. CON: Lackluster DVD movie playback, poorly illustrated setup poster.
Extra features: 15 percent	Setup/ease of use: 5 percent	Graphics: 15 percent	R & S: 35 percent	
Food: ATI Rage 128 Pro graphics board with 16MB of SGRAM, 12X DVD- 10M drive, V.90/DSL modem	Satisfactory/ Good	Good	Outstanding/ Good	PRO: Good-performing PC with top-notch system reliability rating. COM: Small hard disk, some blocky images in games.
ood: Creative Labs 3D Blaster Annihilator graphics board with 32MB of DRAM, 8X DVD-ROM drive, V.90 modem, lomega Zip 100 drive	Good/ Satisfactory	Good	Fair/ Fair	PRO: Fastest midrange system, swift 3D gaming performance. CON: Expensive; poorly illustrated setup sheet, inadequately marked ports.
ood: Diamond Viper V770 graphics board with 16MB of SDRAM, 8X DVD- OM drive, V.90 modem	Outstanding/ Good	Good	Good/ Fair	PRO: Inexpensive; quick setup, COH; Small fonts fuzzy at high resolutions, lackluster audio.
cod: 3dfx Voodoo3 3000 graphics board with 16MB of SDRAM, 12X DVD- OM drive, V.90 modem	Satisfactory/ Good	Good	Fair/ Fair	PRO; Low price and quick performance make it a great deal. COM; Comes with a mediocre monitor and keyboard.
ery good: Matrox Millennium G400 graphics board with 32MB of GRAM, 8X DVD-ROM drive, V.90 modem	Good/ Satisfactory	Good	- 112 <b>•</b> (1) La = 1 4	PRO: Zippy performance, dual-display graphics support. CON: Pricey for its class, no setup poster, inadequate connector and cable labels.
Extra features: 10 percent	Setup/ease of use: 10 percent	Graphics: 10 percent	R & S: 35 percent	
iood: integrated intel 810 graphics with UMA and 4MB of 3D cache, 8X VVD-ROM drive, V.90 modem	Good/ Good	Satisfactory	Fair/ Fair	PRO: Terrific value for a Pentium III-650 processor, roomy interior. CON: Small fonts blurry, scant software bundle, rudimentary manual.
atisfactory: integrated intel 810 graphics with UMA and 4MB of 3D ache, 17X-40X CD-ROM drive, V.90 modem	Outstanding/ Very good	Satisfactory	Fair/ Fair	PRO: Lowest-priced system on the chart, incredibly easy to set up. COM: A tad slow, tiny hard drive.
ood: integrated Intel 810 graphics with UMA and 4MB of 3D cache, 6X VD-ROM drive, V.90 modem	Good/ Satisfactory	Satisfactory	Fair/ Fair	PRO: Speedy budget PC with more memory than many other budget systems. CON: Slow in 3D games, middling sound system.
ood: ATI Xpert 128 graphics board with 16MB of SDRAM, 8X DVD-ROM rive, V.90 modem	Good/ Good	Satisfactory	,	PRO: Good monitor and easy expandability in an accessible case. COM; Somewhat slow for its CPU class, flimsy keyboard.
ery good: integrated Intel 810 graphics with UMA and 4MB of 3D cache, YX-40X CD-ROM drive, 4X/4X/24X Compaq CD-RW drive, V.90 modem	Very good/ Very good	Satisfactory	Poor/ Fair	PRO: Ample storage, with a 17GB hard drive and CD-RW drive. CON: The mos expensive system on the budget chart.
Extra features: 10 percent	Setup/ease of use:	Graphics: 10 percent	R & S: 35 percent	

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).

3 Insufficient data to give a rating.

CPU is complemented by 128MB of RDRAM, which is supposed to speed memory-intensive applications (though we haven't detected any dramatic benefits at current CPU speeds). Together they pushed this Dimension to a PC World-Bench 2000 score of 146. Its bundled graphics board, using NVidia's GeForce 256 chip set and 64MB of DDR SDRAM

(twice as much as most other graphics boards), delivered excellent speed and stunning images in games. A digital video-out connector on the graphics board accommodates digital displays, most commonly flat panel. The included modem supports both V.90 and DSL technologies for high-speed digital Web access. The Harman/Kardon HK595 sound sys-



**FALLING PRICES: The Dell Dimension XPS** B733r stays at the top after a major price cut.

tem-with a subwoofer almost the size of an end table-produces strong sound and thumping bass. Dell also receives great service and reliability scores.

WHAT'S NOT: Even at its reduced price, \$2589 is still a lot to pay for a home PC. Though you get a big 20GB hard drive and a 100MB Iomega Zip drive, we would have liked to see a CD-RW drive included for that kind of money.

WHAT ELSE: Text and graphics looked crisp and clear at a resolution of 1280 by 1024 on the 19-inch Dell M990 monitor. An excellent instruction sheet and thorough documentation make setup simple. and the easy-off cover helps with adding cards and drives. The spacious interior holds three open PCI slots and three open drive bays. Dell provides some basic software-Microsoft Works Suite 2000 and Norton AntiVirus 2000.

BEST USE: This DSL-ready PC is ideal for graphics work and 3D games, thanks to its fast CPU and killer graphics card.

#### MIDRANGE HOME PCS

#### 1 DELL DIMENSION XPS T600R



WHAT'S HOT: Dell's Dimension XPS T600r earns a PC World-Bench 2000 score of 136—very

high for a Pentium III-600E unit. On the multimedia front, DVD movie playback looked sharp on the 19-inch Dell M990 monitor, and small fonts appeared crisp at 1280 by 1024 resolution. If you plan to use this PC with a high-speed DSL connection, the bundled V.90/DSL modem delivers. The T600r's interior allows easy



AFFORDABLE POWER: Dell's Dimension XPS T600r is a quick performer that doesn't cost an arm and a leg.

access to its three available PCI slots and four open drive bays.

WHAT'S NOT: The system's ATI Rage 128 Pro graphics card produced middling scores on our 3Dgaming tests. Some images in Expendable looked blocky.

WHAT ELSE: An illustrated setup poster and clearly marked cables make setting up this PC a cinch. We also liked the Altec Lansing ACS340 speakers and subwoofer, which produced crisp sound. The solid, no-frills keyboard permits adequate key travel. Bundled soft-

ware includes Microsoft Works Suite 2000 and Norton AntiVirus 2000.

BEST USE: This strong, if slightly pricey, PC is suitable for day-to-day computing chores as well as multimedia tasks.

#### UDGET HOME PCS

#### 1 QUANTEX M650



WHAT'S HOT: The M650's \$1099 price is \$250 lower than it was a month ago, making this comput-

er far less expensive than a typical Pentium III-650 system. Its two open PCI slots and four open drive bays allow you to add components easily.

WHAT'S NOT: The Quantex M650's PC WorldBench 2000 score of 132 is a tad below average for its CPU class (though it's quite good for a budget system). In addition, the PC turned in slow performance on our 3D-gaming tests and displayed exaggerated contrast in Quake 3 Arena scenes. DVD movie playback remained a

> bit dark even after we chose the highest possible brightness settings in the DVD player software.

> WHAT ELSE: Cables and connectors are clearly marked and color-coded. but a poorly illustrated setup poster offers little guidance. The generic user manual accompanying the M650 covers the basics but contains little information specific to this PC. The attractive software bundle includes Corel WordPerfect Office 2000, Grolier Encyclopedia, and McAfee VirusScan.

> BEST USE: Home-office users who



CHEAP EXPANDABILITY: Even less expensive than last month, the Quantex M650 offers ample room to grow.

know their way around a PC and have little need for fast graphics processing will find this system an outstanding bargain.

#### What's New

OF THE SIX NEW systems we tested this month, two did well enough to earn spots on the chart-one each in the power and midrange price classes. Number two on the power side is the Micron Millennia Max 733, one of the fastest PIII-733 home PCs ever. It comes with a 19-inch 900LX monitor, which displayed rich color and readable text. The system's DVD movie playback was a bit dark, but adjusting the monitor brightness helped.

On the midrange chart, the CyberMax ValueMax 700 debuts at number four. Its 140 score on PC WorldBench 2000 is tops for a 700-MHz Athlon machineand at just \$1249, this ValueMax justifies its name. Its biggest drawback is a blurry CyberMax CX700DP monitor.

Contributing Editor Kirk Steers also writes Hardware Tips for PC World.

#### ALSO NEW THIS MONTH



We evaluated the following systems along with the others, but they didn't score high enough to

reach the Top 15 Home PCs chart. For writeups, visit PCWorld.com (www.pcworld.com/ top400/newhomepcs).

- Quantex M500c
- ♦ Kaypro 6100
- ◆ IDot Explora A450
- ◆ IBM Aptiva E Series 805



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# TOP 10 PRINTERS

	COLOR LASER PRINTER	Street price (4/14/00)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/color graphics	Comments
1	Minolta-OMS Magicolor 2 DeskLaser 800/523-2696 www.qms.com	\$1274	85	7.8/1.0	Very good/ Very good	FEATURES: Rated 16 ppm monochrome/4 ppm color. Standard 8MB of RAM, 600-by-600-dpi maximum resolution, 250 pages input and output. SUMMARY: Not only is it the least expensive model on the chart, but this well-designed Minolta-OMS color laser also is relatively speedy at printing text and produces high print quality across the board.
2	Brother HL-2400CeN NEW 800/276-7746 www.brother.com	\$1999	83	9.4/1.1	Very good/ Good	FEATURES: Rated 16 ppm monochrome/4 ppm color. Standard 32MB of RAM, 2400-by-600-dpi maximum resolution, 250 pages input and output. SUMMA-RY: Brother's new color laser is the fastest on the chart at printing text. The HL-2400CeN also creates crisp text and rich, detailed graphics for a low price, earning a place as this month's new Best Buy.
3	Lexmark Optra Color 1200n 800/539-6275 www.lexmark.com	\$4589	81	7.8/2.1	Good/ Adequate	FEATURES: Rated 12 ppm on both monochrome and color. Standard 32MB of RAM: 1200-by-1200-dpi maximum resolution; 350 pages input, 250 output. SUMMARY: Lexmark's LED model performs well, printing graphics especially fast. It also offers a wealth of features—including the capability to produce tabloid-size pages (11 by 17 inches)—for a steep price.
4	NEC SuperScript 4200N 800/632-4636 www.nectech.com	\$2199	81	8.8/1.1	Very good/ Very good	FEATURES: Rated 16 ppm monochrome/4 ppm color. Standard 32MB of RAM. 1200-by-1200-dpi maximum resolution; 500 pages input, 250 output. SUM-MARY: You'll get solid print quality (including crisp text and detailed graphics), speedy text printing, and a good range of features on the 4200N, NEC's version of a low-end color laser.
5	Tektronix Phaser 750/N by Xerox 800/835-6100 www.tektronix.com	\$2295	81	7.3/1.4	Good/ Very good	FEATURES: Rated 16 ppm monochrome/5 ppm color. Standard 64MB of RAM, 1200-by-600-dpi maximum resolution; 350 pages input, 500 output. SUM-MARY: The reasonably priced Phaser 750/N offers middle-of-the-road performance but strong print quality. Added benefits include a user-friendly control panel and a comprehensive online manual.
6	Minolta-QMS Magicolor 6100N 800/523-2696 www.qms.com	\$3654	80	8.3/1.0	Very good/ Very good	FEATURES: Rated 24 ppm monochrome/6 ppm color. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution; 250 pages input, 500 output. SUM-MARY: The only new tabloid-size printer to make the chart this month, the 6100N matches our Best Buy Minolta-OMS in its handsome print quality. This fuller-featured model is the cheapest tabloid-size printer on the chart.
7	IBM Infoprint Color 8 800/358-6661 www.printers.ibm.com	\$2499	80	5.5/1.9	Very good/ Good	FEATURES: Rated 8 ppm on both monochrome and color. Standard 32MB of RAM; 600-by-600-dpi maximum resolution; 500 pages input, 250 output. SUMMARY: IBM updated drivers and turned off a power-saving feature of the Infoprint Color 8, increasing text and graphics speeds in our retests. Text and graphics are clear and detailed.
8	NEC SuperScript 4400N 800/632-4636 www.nectech.com	\$2499	79	9.2/1.2	Good/ Very good	FEATURES: Rated 16 ppm monochrome/4 ppm color. Standard 96MB of RAM, 1200-by-1200-dpi maximum resolution; 500 pages input, 250 output. SUM-MARY: This full-featured and speedy color laser costs \$300 more than the number four SuperScript 4200N, but it makes its mark by churning out text lightning-fast. Graphics speeds are slower, however.
9	Kyocera Mita Ci1100 800/222-6482 www.kyoceramita.com	\$2718	78	7.0/1.2	Very good/ Good	FEATURES: Rated 16 ppm monochrome/4 ppm color. Standard 48MB of RAM, 1200-by-1200-dpi maximum resolution; 350 pages input, 500 output. SUM-MARY: Dark, readable text and a good array of features round out this reasonably priced model. Unfortunately, the Cil100's weak documentation and confusing control panel can be frustrating.
10	Tektronix Phaser 850/N NEW by Xerox 800/835-6100 www.xerox.com	\$2495	78	6.8/2.4	Very good/ Adequate	FEATURES: Rated 8 ppm on both monochrome and color. Standard 32MB of RAM; 1200-by-600-dpi maximum resolution; 700 pages input, 500 output. SUMMARY: Using heated wax instead of a laser, the Phaser 850/N is quicker at printing graphics than any other model here. Those fast-printing graphics are grainy, however, and lack detail.



WWW TEST The overall rating we assign to each ink jet printer is based on a combination of six measures, given the following weightings: print quality (25 percent), price (25 percent), features (15 percent), ease of use (15 percent), speed (10 percent), and service and support (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

'All street prices include a network card.



SAY HELLO TO some great new color lasersand good-bye to two favorites. Recently discontinued printers from Lexmark and Xerox leave space for three fresh faces to debut on our chart.

We tested four new models this month; Brother's HL-2400CeN leads this pack, claiming second place with a low \$1999 price and fast text speed. Two Tektronix-labeled Xerox models (Xerox acquired Tektronix's printer division) also make

the chart: The \$2295 Phaser 750/N lands in fifth place, and the \$2495 Phaser 850/N nabs tenth. But NEC's \$2999 SuperScript 4650N misses getting on board-two older NEC models offer a better balance of price and speed.

We retested IBM's Infoprint Color 8 this month because IBM updated the printer's drivers and corrected a powersave feature that resulted in slow printing speeds. Improved speeds (31 percent faster on text at 5.5 ppm and over twice as fast on graphics at 1.9 ppm) and a new \$2499 price help it climb to seventh place, though its text speed is still slow.

#### **TOP 10 NEWBIES**

BROTHER'S HL-2400CEN makes its debut in second place. At 9.4 pages per minute, the HL-2400CeN is the fastest text printer on the chart. It's also among the least expensive, at \$1999. While it prints graphics slower than most others on the chart (1.1 ppm), it's still fast and prints razor-sharp text, straight narrow lines, smooth grays, and detailed if slightly oversaturated color images. The documentation, however, could be better. The printer ships with 13 printed manuals, brochures, and fliers, but most of the useful information comes on a CD-ROM. The control panel is one of the most confusing we've seen-Brother dedicates a 70-page chapter to it in the manual. A legal-size paper tray costs \$150 extra.

The Tektronix Phaser 750/N by Xerox shows a hint of shadowing and some jaggedness on large letters, but it prints smooth, detailed images in both gray-scale and color. We were also impressed with its narrow lines, which were straight and sharp. At \$2295, it's relatively inexpensive, and it prints speedily enough, with text at 7.3 ppm and graphics at 1.4 ppm. The Phaser 750/N's control panel is easy to understand, but it sits on the side of the printer, so you may have to crouch to see it. A comprehensive online manual runs about 900 pages and covers everything you could want to know about printing.

The \$2495 Tektronix Phaser 850/N doesn't use the powdered toner of laser printers; instead, it uses solid ink, which comes in waxy blocks that get heated and sprayed as a vapor onto the drum. This technology accounts for the 850/N's reasonable price and low operating costs: Solid ink printers have few components to replace, and Tektronix provides free black ink for the lifetime of the printer. The Phaser 850/N's 2.4-ppm graphics speed is the fastest on the chart, but text speed is slightly slower than most of its peers', at 6.8 ppm. Print quality suffers with solid ink technology, however. The wax scrapes easily off the paper, and although text looks rich and black, it's also



Magicolor 2 DeskLaser is the least expensive laser on the chart and remains a Best Buy.

choppy. Narrow lines are smudged and banded, and color and gray-scale graphics look as if they were printed on a mediocre ink jet-dark, grainy, and undetailed.

NEC's new SuperScript 4650N doesn't offer enough to displace some venerable NEC printers. It boasts Internet printing capabilities (its own IP address for printing over the Web), but we've seen this feature in other printers. The SuperScript 4650N prints text quickly at 8.9 ppm, but its graphics speed is a bit slow at 1.2 ppm. It produces sharp text; clean lines; and smooth, if dark, graphics. Price keeps it off the chart: At \$2999, it costs \$500 more than the SuperScript 4400N, which prints text even faster.

#### PRICE MYSTERIES

WE'VE BEEN EXPECTING laser printer prices to rise in the United States as Japan's currency strengthens; even domestic manufacturers rely on Japanese components. But this month IBM cut the price of the Infoprint Color 8 by 7 percent, while Lexmark dropped the Optra Color 1200n's price by 24 percent. Now \$4589, the 1200n climbs from eighth to third place on our chart. Meanwhile, Minolta raised prices on both of its QMS-labeled models: The Magicolor 2 DeskLaser remains our number one printer despite a 15 percent hike to \$1274, and the tabloidsize Magicolor 6100N, up 8 percent to \$3654, slips from fifth to sixth place.

-Dan Littman

#### PRINT QUALITY SAMPLES

#### Tektronix Phasers Get Different Results



is is 6 point t s is 7 point is 8 point is 9 poin s 10 poi



#### TEKTRONIX PHASER 750/N BY XEROX

Though text prints with a few shadows and lagged edges, gray-scale and color graphics show strong detail and subtle transitions.

#### TEKTRONIX PHASER 850/N BY XEROX

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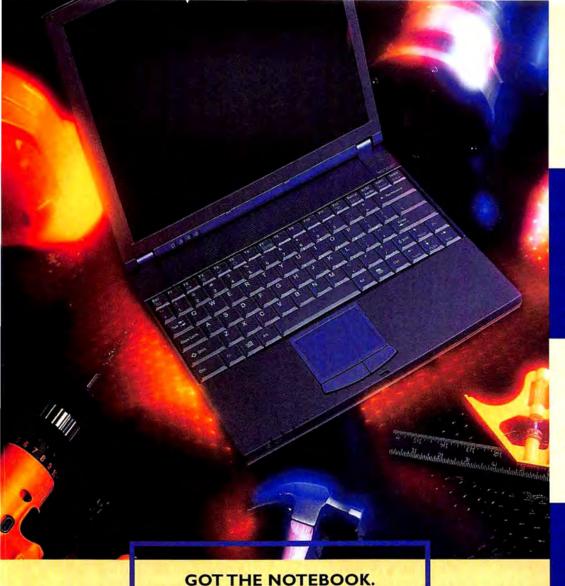
Text appears choppy, and gray-scale and color images are grainy on Tektronix's Phaser 850/N, which uses solid ink technology.

the mark with perfectly sharp text, even in small

Brother's new printer hits

BROTHER HL-2400CEN

type sizes. Grays and color graphics also appear smooth and detailed.



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# TOP 10 SCANNERS

	SOHO SCANNER	NNER Month tested Street price (4/26/00) rating Scan quality Scan speed—B&W at 300 dpi/color at 600 dpi (seconds per page)		Scan speed—B&W at 300 dpi/color at 600 dpi (seconds per page)	Comments		
1	Epson Perfection 1200U 800/463-7766 www.epson.com	Jan 00	\$249	98	Very good 9/67		FEATURES: USB, 1200 by 2400 dpi, 11.3-by-16.8-by-3.5-incase, 9.9 pounds, 8.5-by-17.7-inch scanning area, optional tranparency adapter and automatic document feeder. SUMMAR Outstanding resolution, speed, and scans make this our top pic for \$50 more, you can buy the slightly faster SCSI version.
2	Epson Perfection 636U 800/463-7766 www.epson.com	Nov 99	\$199	97	Very good	12/74	FEATURES: USB, 600 by 2400 dpi, 11.3-by-16.8-by-3.5-inch cas 9.9 pounds, 8.5-by-11.7-inch scanning area, optional transpare cy adapter and ADF. SUMMARY: Fine-quality scans, first-ra features, and good overall performance make this model a clo runner-up to its sibling, the Epson Perfection 1200U.
3	Microtek ScanMaker V6UPL 800/654-4160 www.microtekusa.com	Mar 00	\$130	95	Very good	19/80	FEATURES: Parallel and USB, 600 by 1200 dpi, 11.8-by-21.5-1 3.2 inch case, 8.8 pounds, 8.5-by-14-inch scanning area, includ 35mm transparency adapter. SUMMARY: The only legal-size u on the SOHO chart, now SI9 less, continues to shine. It delive good scans, handles both 35mm slides and reflective art.
	Acer 640U 800/379-2237 www.acerperipherals.com	Jun 00	\$89	89	Good	16/75	FEATURES: USB, 600 by 1200 dpi, 12-by-18-by-3-inch case, 1 pounds, 8.5-by-11.7-inch scanning area, no optional transparr cy adapter. SUMMARY: The 640U-\$10 less this month-deliw competitive performance and good-quality scans, provid ample software, and comes with around-the-clock tech support
5	Umax Astra 2200 800/562-0311 www.umax.com	Jan 00	\$199	88	Good	26/99	FEATURES: SCSI and USB, 600 by 1200 dpi, 12.2-by-18.4-by-inch case, 8.5 pounds, 8.5-by-11.7-inch scanning area, inclust transparency adapter. SUMMARY: This well-rounded perforn handles both reflective and transparent documents and con with a great software bundle for building Web sites.
5	Canon CanoScan FB 630P 800/652-2666 www.ccsi.canon.com	Apr 00	\$99	87	Good	23/118	FEATURES: Parallel, 600 by 1200 dpi, 10.1-by-14.7-by-1.5-in case, 1 3.3 pounds, 8.5-by-11.7-inch scanning area, no option transparency adapter. SUMMARY: The chart's sole Containage Sensor unit weighs a mere 3.3 pounds and provides shall images, but it slows when scanning color.
,	Visioneer OneTouch 8600 888/229-4172 www.visioneer.com	Dec 99	\$200	86	Good	19/96	FEATURES: Parallel and USB,* 600 by 1200 dpi, 16,7-by-11,7- 3,7-inch case,* 4 pounds, 8,5-by-11,7-inch scanning area, opti- al transparency adapter and ADF. SUMMARY: A 599 price di- revives former chart maker. Includes handy seven-button fru- panel and plenty of software, but color accuracy could be bett
	CORPORATE SCANNER				-100		
	Canon CanoScan FB 1200S 800/652-2666 www.ccsi.canon.com	Nov 99	\$299	93	Very good	20/74	FEATURES: SCSI, 1200 by 1200 dpi, 11.5-by-18.1-by-3.7-inch c 8.8 pounds, 8.5-by-11.7-inch scanning area, optional transpa cy adapter and ADF. SUMMARY: Competitively priced corporate to boasts great color and detail and comes packaged its SCSI card. Long tech-support hours add to its overall va
2	HP ScanJet 6350C 800/722-6538 www.scanjet.com	Nov 99	\$499	92	Very good	13/76	FEATURES: SCSI and USB, <sup>2</sup> 1200 by 2400 dpi, 12.3-by-19.6- 7.6-inch case, <sup>1</sup> 15.8 pounds, 8.5-by-11.7-inch scanning ar includes transparency adapter and ADF. SUMMARY: A gr choice for OCR, this durable veteran scans 35mm slides and p duces top-quality scans.
3	Epson Expression 1600 Artist 800/463-7766 www.epson.com	Jun 00	\$899	92	Very good	10/52	FEATURES: SCSI and USB, 1600 by 3200 dpi, 13-by-22.2-by-5 inch case, 18.7 pounds, 8.5-by-1-inch scanning area, optio transparency adapter and ADF. SUMMARY: Speed and co accuracy put pricey unit on the chart. With \$299 adapter, thigh-res model is a top choice for scanning transparencies.

HOW WE TEST All scanners are tested with default settings under Windows 98 on a Dell Dimension V333 (Pentium II-333) PC with 64MB of RAM, using each scanner's bundled software. Overall score is based on scanned image quality (28 percent), scanning speed (25 percent), ease of use (17 percent), features (15 percent), support (10 percent), and price (5 percent). Speed tests are timed from the start of scanning until cursor control is regained. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

1 Dimensions are listed in the following order: width, depth, and height.

2 Scanner was tested with USB interface.



MICROTEK, ACER, and Visioneer drop their prices this month. Though the SOHO chart remains remarkably stable, Visioneer's \$99 price cut puts the OneTouch 8600 back in the running and shoves HP's ScanJet 5300Cse off the chart. On the corporate chart, Canon's sharp, well-priced CanoScan FB 1200S continues to dominate, but Epson's Expression 1600 offers a smart new option for those scanning high-end graphics.





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# TOP 10 MONITORS

	17-INCH MONITOR	Month tested	Street price (4/20/00)	Overall rating	Quality of text/graphics	Comments
1	Sony Multiscan CPD-E200 888/476-6972 www.sony.com/displays	Feb 00	\$350	89	Very good/ Excellent	FEATURES: 15.6-inch viewable area, .2425mm variable stripe pitch FD Trinitron tube, up to 85-Hz refresh rate, Plug and Play ready, TCO'99 compliant, one-year warranty, 24-hour daily toli-free support. SUMMARY: A \$29 price reduction, gorgeous colors, and razor-sharp text propel this model to the top. On-screen controls are accessed under the front bezel.
2	Samsung SyncMaster 700NF 800/726-7864 www.samsungmonitor.com	NEW	\$299	88	Very good/ Excellent	FEATURES: 16-inch viewable area, .25mm stripe pitch Diamondtron NF tube, up to 85-Hz refresh rate, Plug and Play ready, TCO'99 compliant, three-year warranty, 24-hour daily toll-free support. SUMMARY: Radiant colors and fine detail make this model a good choice for heavy graphics work. The easy-to-use on-screen controls are set on a retracting panel.
3	CTX PR705F 877/857-7846 www.ctxintl.com	Apr 00	\$309	87	Excellent/ Very good	FEATURES: 15.9-inch viewable area, .2425mm variable stripe pitch FD Trinitron tube, up to 105-Hz refresh rate, Plug and Play ready, TCO'99 compliant three-year warranty, 12-hour weekday toll-free support. SUMMARY: A \$40 reduction in price nudges this model up a notch. Great for word processing and spreadsheets, but it lacks advanced controls.
4	NEC MultiSync FE700 800/632-4636 www.nectech.com	Feb 00	\$299	87	Very good/ Excellent	FEATURES: 15.6-inch viewable area, .25mm stripe pitch Diamondtron NF tube, up to 97-Hz refresh rate, *Plug and Play ready, *TCO*99 compliant, three-year warranty, 11.5-hour weekday toll-free support. SUMMARY: Rich, vibrant colors on photographs and Web pages, but the text could be a little sharper. On-screen controls require lots of button pressing.
5	Princeton AGX740 800/747-6249 www.princetongraphics.com	Apr 00	\$299	87	Very good/ Excellent	FEATURES: 15.8-inch viewable area, .25mm stripe pitch Diamondtron tube, up to 85-Hz refresh rate. Plug and Play ready, TCO'99 compliant, three-year warranty, 9-hour daily toll-free support. SUMMARY: Lively colors on photographs. Monitor provides high-end controls, but its zoom settings don't work as well as those on other units. Technical support hours could be more generous.
6	Sony Multiscan CPD-G200 888/476-6972 www.sony.com/displays	NEW	\$400	87	Very good/ Excellent	FEATURES: 16-inch viewable area, .2425mm variable stripe pitch FD Trinitron tube, up to 85-Hz refresh rate, Plug and Play ready, TCO'99 compliant, three year warranty, 24-hour daily toll-free support. SUMMARY: Colors are brisk and text is crisp, but you can find comparable image quality at a lower price. Onscreen controls are very difficult to navigate.
7	Mitsubishi Diamond Plus 73 800/843-2515 www.mltsubishi-display.com	NEW	\$289	85	Good/ Excellent	FEATURES: 16-inch viewable area, .25mm stripe pitch Diamondtron NF tube, up to 67-Hz refresh rate, Plug and Play ready, TCO'99 compliant, three-year warranty, 12-hour daily toll-free support. SUMMARY: Colors are vivid, but the text in word-processing documents and spreadsheets is not as sharp as on other monitors. On-screen controls lack word descriptors.
8	liyama VisionMaster Pro 410 800/394-4335 www.iiyama.com	Nov 99	\$380	85	Very good/ Very good	FEATURES: 15.7-inch viewable area, .25mm stripe pitch Diamondtron NF tube, up to 90-Hz refresh rate. Plug and Play ready, TCO'99 compliant, three-year warranty, 12-hour weekday toll-free tech support. SUMMARY: A \$49 price drop brings this model back onto the chart. Still a bit pricey, but renders particularly lively colors and graphics. On-screen menus require extra scrolling.
9	IBM P76 800/426-7255 ext, 4753 www.ibm.com/options	Feb 00	\$399	84	Very good/ Excellent	FEATURES: 15.6-inch viewable area, .2425mm variable stripe pitch FD Trinitron tube, up to 117-Hz refresh rate. Plug and Play ready, TcO'99 compliant three-year warranty, 24-hour toll-free support. SUMMARY: This model's bold, impressive graphics offset minuscule on-screen controls that are hard to press. The price is still above average despite a \$30 drop.
10	EPI AOC7GIr 888/838-6388 www.epius.com	NEW	\$199	84	Satisfactory/ Very good	FEATURES: 16-inch viewable area, .25mm dot pitch tube, up to 85-Hz refresh rate, Plug and Play ready, TCO'92 compliant, three-year warranty, 10-hour daily support. SUMMARY: A good choice for price-conscious buyers who are willing to overlook display's merely average text quality. Colors on Web pages look bright. On-screen menu has some advanced controls.



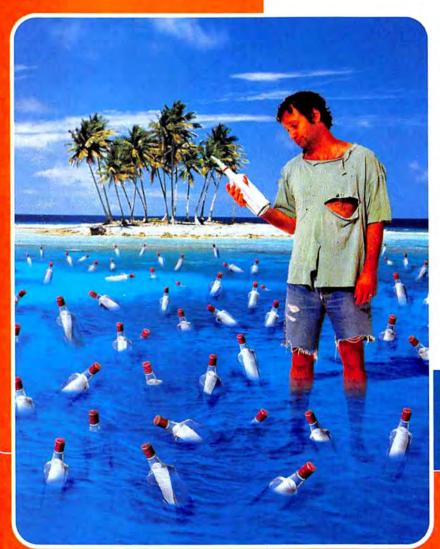
HOW WE TEST Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, a newsletter, spreadsheets, Web pages, and scanned images. The overall rating is based on text and graphics quality (25 percent each), price (25 percent), features and ease of use (20 percent), and service and support (5 percent). The best posare strung farther apart than those near the middle. 'Highest 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.



FLAT-SCREEN CRTs control nine spots on the chart this month. Of the four newcomers, Samsung's SyncMaster 700NF ascends the highest, thanks to its bright colors and reasonable price.

Sony's CPD-G200 and Mitsubishi's Diamond Plus 73 also render bold graphics. The AOC7Glr from EPI carries a \$199 pricethe lowest we've seen for a 17-incher. Models from Optiquest and Panasonic fell short. Next month we look at 19-inchers.

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# TOP 10 GRAPHICS BOARDS

	AGP BOARD	Month tested	Street price (5/5/00)	Overall rating	Mixed-media business rating	3D games rating	Features rating	Comments
1	Guillemot Maxi Gamer Xentor 32 877/484-5536 www.guillemot.com	Feb 00	\$180	92	Very good	Excellent	Good	FEATURES: 2X AGP, NVidia RIVA TNT2 Ultra chip, 32MB of SDRAM 300-MHz RAMDAC, TV-out, bundled 3D games—interplay's King pin: Life of Crime and UbiSoft's Speed Busters. SUMMARY: Grea 3D speed at the second lowest price on the chart makes this TNT/Ultra board a superb buy.
2	Matrox Millennium G400 Max 800/361-1408 www.matrox.com/mga	Apr 00	\$209	91	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, dual-display support, and an affordable price keep the G400 Max near the top.
3	Diamond Viper II 800/468-5846 www.s3.com	June 00	\$179	90	Very good	Very good	Good	FEATURES: 4X AGP, S3 Savage 2000 chip, 32MB of SDRAM, 350 MHz RAMDAC, TV-out, bundled 3D game—Acclaim's TrickStyle SUMMARY: Affordably priced card renders excellent perfor mance in Unreal Tournament but loses a few frames per second in Ouake 3 even with its latest drivers.
4	Cardexpert GeForce 256 DDR 800/539-2273 www.gainward.com	June 00	\$250	89	Excellent	Excellent	Good	FEATURES: 4X AGP, NVIdia GeForce 256 chip, 32MB of DDI SGRAM, 350-MHz RAMDAC, TV-out, bundled 3D games-Psy gnosis's Drakan and Rollcage. SUMMARY: Speedy gaming board looks good in Unreal Tournament and Quake 3 and is cheaper that most of its DDR competition.
5	Leadtek WinFast GeForce 256 DDR 510/490-8076 www.leadtek.com	May 00	\$249	87	Excellent	Excellent	Good	FEATURES: 4X AGP, NYIdia GeForce 256 chip, 32MB of DDI SGRAM, 350-MHz RAMDAC, TV-out, Asymetrix 3D/FX and Digita Video Producer, bundled color-calibration tools. SUMMARY Costs less than others with DDR memory and renders excellen lighting effects in Ouake 3.
6	3dfx Voodoo3 3500 TV 800/234-4334 www.3dfx.com	Feb 00	\$200	86	Very good	Very good	Good	FEATURES: 4X AGP, 3dfx Voodoo3 chip, 16MB of SDRAM, 350 MHz RAMDAC, TV tuner, TV-out, no bundled 3D games. SUMMA: RY: Fast, full-featured card includes video editing software bu lacks 32-bit 3D rendering. Voodoo3 3000 model lacks a TV tuner but performs comparably for \$50 less.
7	Asus AGP-V6600 Deluxe 510/739-3777 www.asus.com	Apr 00	\$249	86	Excellent	Very good	Excellent	FEATURES: 4X AGP, NVIdia GeForce 256 chip, 32MB of SGRAM 350-MHz RAMDAC, video capture, TV-out, 3D glasses, Ulead Video Studio, bundled 3D games-Psygnosis's Drakan and Rollcage SUMMARY: Pleasing performer loaded with video extras gener ated dark scenes in some games.
8	Hercules 3D Prophet DDR-DVI 877/484-5536 www.hercules.com	May 00	\$320	85	Excellent	Excellent	Very good	FEATURES: 4X AGP, Nvidia GeForce 256 chip, 32MB of DDI SGRAM, 350-MHz RAMDAC, TV-out, no bundled applications. SUM MARY: A swift performer, this expensive board renders lovely images but falls short on software extras. Includes digital video interface to connect to digital flat-panel monitors.
9	ATI Rage Fury Pro 905/882-2600 www.ati.com	Feb 00	\$179	84	Good	Good	Very good	FEATURES: 4X AGP, ATI Rage 128 Pro chip, 32MB of SDRAM, 300 MHz RAMDAC, video capture, TV-out, bundled 3D games—Activision's Heavy Gear 2 and GT Interactive's Need for Speed IV. SUMMARY: Affordable and feature-rich ATI board does well in every game but Quake 3 and makes a good choice for casual gamers.
10	Matrox Marvel G400-TV 800/361-1408 www.matrox.com/mga	Feb 00	\$299	83	Excellent	Very good	Excellent	FEATURES: 4X AGP, Matrox G400 chip, 16MB of SGRAM, 300-MH; RAMDAC, TV tuner, TV-out, Avid Cinema, bundled 3D games- Ubisoft's Tonic Trouble and Gremlin Interactive's Wild Metal Coun try. SUMMARY: Feature-packed board lacks 3D speed but makes a great choice for editing home videos.



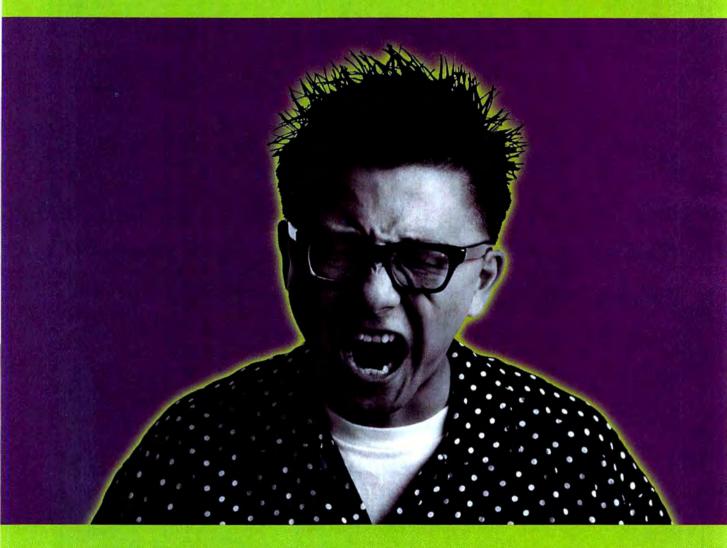
HOW WE TEST We test boards under Windows 98. Business tests include PC WorldBench 98. Our 30-gaming score is based on four games, each evaluated on frame rate and image quality.

We test AGP boards in a Dell Dimension XPS T600 with a Pentium III-600 CPU and 128MB of RAM. Overall AGP 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.



THE GUILLEMOT MAXI Gamer Xentor 32 remains a Best Buy, combining hot gaming performance with an affordable price. Boards based on NVidia's latest chip set, the GeForce2 GTS, should be available now, though none arrived in time for testing. Read about our first look at one of these new boards, the ELSA Gladiac, on page 82. ELSA and Creative Labs have discontinued their popular GeForce 256 boards to focus on the new chip.

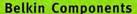
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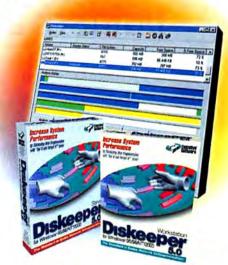
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# HERE'S HOW



WINDOWS TIPS

SCOTT DUNN

# Annotate Your Folders and Files

DO YOU SPEND A LOT of time opening files or folders just to see what's inside them? A good system for naming and organizing files can help, but sometimes you need more informa-

tion than you can fit in a folder or file name. Fortunately, if you have Windows 2000, Windows 98, or Windows 95 with Internet Explorer 4's Desktop Update feature installed, you can create annotations for any fold-

er (and for some files) that are visible as an InfoTip, the small text that pops up when you hold the pointer over an object for a few seconds. You can also see these annotations for a selected item in the preview area of a folder displayed in Web View.

Create Web View folder annotations: If you only want to see a folder annotation in the

preview area of a Web View folder, Windows 2000 offers the simplest method for adding these comments (see FIGURE 1). Just open a folder in Explorer, right-click an empty area of the folder window, and choose Customize This Folder (or choose View-Customize This Folder). In the Customize This Folder (click Next. In

the next panel, make sure *Customize* is selected, and check *Add folder comment*. Click *Next*, type your annotation in the box provided, click *Next*, and click *Finish*.

When using the Customize This Folder Wizard, you will get better results if you do not check the option 'Choose or edit an HTML template for this folder'. A glitch in Windows 2000 causes any HTML template that you choose to override the display of annotations. Though you would still be able to see the annotation of this folder when you selected it from inside another folder, annotations for any folders nested inside the current folder would be suppressed by the template.

If you have already applied a template, you must first run the wizard with the *Remove customizations* option, and then restart the wizard to create or edit your annotation as described above.

Create pop-up folder annotations: You can add annotations that appear not only in the Web View preview but also as a pop-up InfoTip (see FIGURE 2). First, open the folder you want to annotate. In Windows 9x, choose View-Folder Options, click the View tab, and make sure Show all files is selected under 'Hidden files'. Click OK. In Windows 2000, choose Tools-Folder Options, click the View tab, make sure that Show hidden files and folders is selected, and uncheck Hide protected operating system files (Recommended). Click Yes at the warning prompt, and then click OK.

In any Windows version, press **<F5>** to refresh the folder's contents so you can see any hidden files. Look for a file named Desktop.ini (the extension won't be visible if you have that option turned off). This file is created inside a folder any time you customize it, such as with a background picture. Double-click Desktop.ini to open it in Notepad. If you don't see this file, simply start Notepad.

If you opened an existing Desktop.ini

FIGURE 1: ANNOTATE FOLDERS for Web View previews with Windows 2000's Customize This Folder Wizard.

file, look for the line [.ShellClassInfo] (note the period before 'ShellClassInfo'). At the end of the line, hit <Enter>. On the next line, type InfoTip= followed by the text of your annotation—for example Personal and business correspondence with the Dotto Group, 1997 to present. If you don't see [.ShellClassInfo], or if you started with an empty Notepad window, type that line at the top of the file, press (Enter), and type InfoTip= followed by the text of your annotation. Press <Enter> again.

Now choose File. Save. If you started with an empty Notepad window, a dialog box will prompt you for a name and location. Navigate to the folder whose icon you want to change. In the File name box, type "desktop.ini" (including the quotation marks) so Notepad won't add its default .txt extension. Click Save.

You're not done yet. This trick works only with folders that have the System attribute. To change the folder's attribute, first locate the icon for your folder in Explorer (or on the desktop). With Explorer as the active window, click Windows' Start button, select Run, and type attrib +s. Leave the Run box open, drag your folder from Explorer (or the desktop) to the Open box of the Run box, and drop it in. The text should look something like this: attrib +s "c:\My Documents" (the path to your folder will, of course, differ). Click OK. A DOS box will flash momentarily on screen as it applies the System attribute to your folder. Finally, select your folder and press <F5> to refresh the display. As a final touch, if you created a Desktop.ini file, you might want to hide it when hidden files aren't displayed: Right-click the file and choose Properties. Check the Hidden box and click OK.

Annotate files: You can annotate any folder but not just any file. If you're using Windows 98 or 2000, you can easily annotate many applications' files without launching the applications. Select one of these files and press <Alt>-<Enter> to display its properties. Click the Summary tab, and fill in the boxes for Author, Title, Subject, and Comments (see FIGURE

3). Some or all of these entries will appear in your annotation, depending on your version of Windows. Then click OK. If you're using Windows 95, you won't be able to type comments directly into the Properties sheet. But you can open the file in the associated application, choose File. Summary Info or File Properties, and enter the information there.

See the results: To see your annotation, hold the pointer over the folder for a few seconds until the InfoTip box pops up and displays your annotation. If you don't see it, try clicking in the window or on the desktop to make sure the location is active, or press <F5> to refresh the information. Unfortunately, in Windows versions prior to Win 98 Second Edition, you may not see any InfoTips in single-pane folder windows; try the two-pane Explorer window instead. In addition, you may not see any InfoTips if the current folder is displayed as a Web page. To turn off this

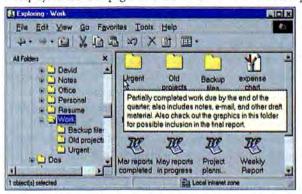


FIGURE 2: ANNOTATIONS MAGICALLY appear when you point to a folder, if you know how to edit the folder's Desktop.ini file.

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feature, choose View-as Web Page and uncheck that command. On the other hand, if you do want to see your annotations as part of the Web preview pane in a folder, you'll have to turn that feature on (choose View-as Web Page again to restore the check mark). In Windows 2000, choose Tools. Folder Options, select Enable Web

content in folders in the Web View section, and click OK. Then select any icon in the folder that has an annotation: the text of the annotation will appear in the Web View preview on the left. In Windows 2000, this text appears both when a folder is selected and when the folder is open but nothing is selected. If you used both methods of



FIGURE 3: SOME APPLICATION FILES can be annotated from their Properties dialog box.

adding annotations described above, Windows 2000 will display the results of both in the preview pane.

What about shortcuts to the folders you've annotated? Unfortunately, you won't see your annotations there. Your text is associated only with the icon for the actual folder, not with shortcuts to that folder. But at least Windows 2000 provides a useful InfoTip for folder shortcuts-one that displays the location of the original (target) folder.

Now that you've annotated your folders, see the next tip for customizing the look of pop-up annotations and tips.

#### **CUSTOMIZE YOUR INFOTIPS** AND TOOLTIPS



WINDOWS 9x introduced a new, less intrusive help system known variously as ToolTips (when the

notes pop up over toolbar icons) or Info-Tips (when they pop up over other kinds of objects). Just hold your mouse over a button or object for a few seconds, andif you're lucky-you'll get a helpful explanation or label. But you may have trouble reading the tiny text they're written in. Or you may want to eliminate some or all of these tips. Here are some ways to boss them around on your system.

Get a new look: If you find the ToolTips too hard to read or if you don't like their font or color, right-click the Desktop and choose Properties. Then click the Appearance tab, and in the Item drop-down list, select ToolTip. Using the two color buttons at the right, choose a background color (top button) and a text color (bottom button) from the pop-up palettes. You can also use the Font and Size drop-down lists and the Bold and Italic buttons to customize the text's appearance further. Then click Apply. Continue tweaking your choices until you're satisfied, and finish by clicking OK.

Though your color choices apply to both InfoTips and ToolTips, the typographic choices (font, type size, bold, italic) affect only ToolTips (the tips you see with toolbar buttons and icons), not the tips you see for folders. In addition, your typographic choices affect the text you see in the status bar at the bottom of the Explorer window (see FIGURE 4). If you don't see the status bar, you can choose View-Status Bar to make it visible. In Windows 95, your folder also affects the text at the top of each of the two panes in Explorer.

When you change the InfoTips' font and size, you also have to change the font and size of the file names in Explorer and of the labels under all icons in Explorer and on your desktop. If that doesn't bother you, return to the Appearance tab of the Display Properties dialog box, and select

Icon from the Item drop-down list. Then use the Font and Size drop-down lists and Bold and Italic buttons as you like.

(Minitip: Avoid using bold for icon text. Some Windows dialog boxes use boldface to indicate a default choice in a list, so making everything bold obscures this information.)

You can also customize an-View. In Windows 2000, fol-

low the steps above for customizing the color of the font and its background. To change the font and type size for Web View annotations in Windows 2000. choose Menu from the Item drop-down and change the font settings. (Naturally, this will change the font on your menus as well.) In other versions of Windows, you can customize the font and the size by opening the folder window and choosing View. Customize This Folder.

Make sure Create or edit an HTML document is selected in the resulting dialog box, and click Next twice. When the HTML document (Folder.htt) opens in Notepad, skip down a few lines until you see an indented line beginning with the word 'body'. To the right of that, you should see font information like this: {font: 8pt/10pt verdana; margin: o}. Edit the type size and line spacing (the first two numbers) and the font name. (Unfortunately, variants such as bold and italic are ignored.)

When you're done, the text in braces should look something like this: {font: 14pt/18pt Arial Narrow; margin: 0} (naturally, your specifications may differ). From Notepad's menu, choose File Exit, click Yes when prompted to save the file, and click Finish in the Customize This Folder Wizard.

Customize tips for Windows' own icons: You may have noticed that if you select and then hold the pointer over the icons Windows installs-My Computer, Network Neighborhood, Control Panel, Recycle Bin, and so forth-you will see an InfoTip describing the function of these icons. If for any reason you want to change this text, you can do so by editing



notations that appear in the FIGURE 4: GET DESIGNER TOOLTIPS by specifying the font, preview area of a folder in Web type size, and color in the Display Properties dialog box.

the Windows Registry. Because editing the Registry can be dangerous, attempt this task only if you are familiar with the Registry and are willing to proceed at your own risk. Choose Start-Run, type regedit, and press (Enter). Choose Edit-Find, type InfoTip, and make sure that only the Values and Match whole string only check

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\* OR FASTER CPU. ALL FEATURES SUBJECT TO AVAILABILITY AT THE TIME OF THE DRAWING.



# PC Troubleshooting Q&A

F YOUR COMPUTER ACTS LIKE IT'S GONE OUT OF ITS MIND, HERE ARE SOME TIPS TO GET IT THINKING STRAIGHT AGAIN.

#### START-UP AND Shutdown

WINDOWS TAKES MUCH LONGER TO LAUNCH THAN IT USED TO. HOW CAN I SPEED IT UP?

Applets in Windows' start-up list can slow down start-up. The Windows 98 System Configuration Utility's Startup tab (select Start. Run and enter msconfig) lets you disable such applets so you can see what's necessary. Uncheck an applet's box, and it won't load the next time you start Windows. Then see if launch time improves.

WINDOWS DOESN'T SHUT DOWN PROPERLY. HOW CAN I FIX IT?

In the System Configuration Utility's General tab, click Advanced and check Disable fast shutdown. Reboot, and try to shut down the system. If your PC lacks the Disable option, go to Microsoft's Knowledge Base (search.support.microsoft.com/kb/ c.asp) and find article Q202633 (Windows 98) or article Q238096 (Windows 98 SE).

#### COMPUTER Lockups

MY COMPUTER HANGS ON START-UP OR AFTER WINDOWS LOADS. WHAT CAN I DO?

Screen Is Blank Secure all of your external cables and power cords, and reset your surge protector. Next, open your PC's cover and remove and reseat each add-in card. Also secure the power connectors and data cables for your drives.

PC Hangs Before Windows Loads Watch for on-screen messages as your PC boots; you may identify a troublesome component. To stop the screen from scrolling past a message, press (Pause).

PC Hangs While Windows Is Running Open Windows 98's System Configuration Utility (hit Start-Run, enter msconfig. click OK, and click the Startup tab). Make sure Windows isn't starting any processes twice. After you're done, reboot your PC.

To look for device conflicts, right-click My Computer, choose Properties, and select the Device Manager tab. Double-click components marked with a yellow circle and exclamation point. If a device is misbehaving, click its Resources tab and look in the Conflicting Device list. Remove or disable one device in any pair of conflicting devices (select Disable in this hardware profile on that device's General tab). Then restart your computer.

To locate a misbehaving device, restart Windows and hold down (F8>. On the Startup Menu, select Step-by-Step confirmation. As Windows initializes each device, an error message or Windows lockup will indicate the culprit.

#### THE Internet

I'M HAVING TROUBLE WITH MY INTERNET CONNECTION. WHAT SHOULD I CHECK?

First, check all modem connections. If you have other devices connected to a modem's line, try removing them.

To check your modem's line, attach a phone to it and listen as you dial. If you hear a lot of static, report it to your phone service provider, who should correct it.

To check your modem, select Start-Settings. Control Panel and open Modems. On the Diagnostics tab, select the port your modem is attached to and click More Info.

#### DRIVE Troubles

OVER THE PAST FEW WEEKS, MY COMPUTER HAS SLOWED DOWN A LOT, AND ITS DISK IS VERY ACTIVE, WHAT'S GOING ON?

In Explorer, right-click your hard drive's icon and select Properties to take a look at your hard drive's available free space. If you're short on space, Windows' virtual memory, a temporary storage area on your hard drive, is likely too cramped to perform adequately.

To free up space, run Windows 98's Disk Cleanup utility: Start-Programs-Accessories System Tools Disk Cleanup. It provides shortcuts to remove unused Windows files and programs. Next, run Disk Defragmenter (Start-Programs-Accessories. System Tools. Disk Defragmenter) so Windows can find files more efficiently.

#### HARD Copies

MY COMPUTER'S LOCAL PRINTER WON'T PRINT ANYTHING, WHAT CAN I DO?

Confirm that your printer is online, that it has paper, and that its ink or toner cartridge is properly installed. Turn the printer off, wait a bit, and turn it back on.

Next, select Start-Shut Down-Restart in MS-DOS mode and click OK. At the DOS prompt, type cd\windows, press <Enter>, and then type dir /s >LPT1 and <Enter>.

If a list prints, but you can't print from within Windows, click Start-Settings-Printers, delete your printer's icon, and use Add Printer to reinstall it. Have your printer's and Windows' CD-ROMs ready.

If the list doesn't print, check your printer cable and then your parallel port settings. In your PC's CMOS setup program, set your parallel port to Standard mode.

By Kirk Steers, with contributions from Lenny Bailes. Excerpts from an article posted on PCWorld.com at www.pcworld. com/heres\_how/article/troubleshooting. Visit PCWorld.com's Here's How section at www.pcworld.com/heres\_how.

boxes are checked. Then click Find Next.

The search should stop at one of the annotations for these files. Usually you can tell which icon you are annotating by looking at the text to the right of the '(Default)' icon that appears above the InfoTip icon. In the case of My Computer and Network Neighborhood, however, the text next to the (Default) icon simply reads '(value not set)' (Windows 9x only).

You should still be able to tell which icon's InfoTip you are editing, though, by referring to the text next to the InfoTip icon. Suppose, for example, that you want to customize the InfoTip for the My Computer icon. Press <F3> to continue the search until you find the InfoTip text that reads 'Displays the contents of your computer'. To be on the safe side, choose Registry. Export Registry File to make a backup of the Registry portion you are about to change. Make sure that Selected branch is selected; then designate a name and location, and click Save.



FIGURE 5: EDIT THE WINDOWS Registry to customize InfoTips for desktop icons.

Now you are ready to make some changes: Double-click the InfoTip icon, and change the tip text in the Edit String dialog box to something like Dad's computer. Then click OK. Use the same technique on any other icons the search finds, and then exit the Registry. You may have to exit and reopen an Explorer window to see the change there, and you may have to restart Windows to see a change on the desktop (see FIGURE 5).

As you search the Registry in Windows 2000, you will notice that you can edit the InfoTip text for certain file types (such as compressed .cab files), and you can even edit the InfoTips for several of the Control Panel icons.

Turn off obvious tips (Windows 98 and 2000 only): New users may not know the purpose of the minimize, maximize/

restore, and close buttons at the top right corner of each window. But you do, so why should you have to see a ToolTip pop up every time your pointer lingers

too long over one of those buttons? You can turn specific tips off, but doing so again involves editing the Registry, so be careful. Start the Registry Editor as explained in the previous tip. Navigate down the tree in the left pane until you are able to select the folder icon labeled HKEY\_CURRENT\_

USER\Control Panel\desktop.

To be safe, export a backup of this branch, as explained in the previous tip. Then in the right pane of the Registry Editor, dou-

ble-click the UserPreferencemask icon (Windows 9x) or UserPreferencesMask (Windows 2000). This will open the Edit Binary Value dialog box. Inside it, a text cursor will flash in the Value data area, just before two characters or numbers.

What you type depends on the first alphanumeric character in this pair: If the first character is a, type 2. If it's b, type 3. If it's c, type 4. If it's c, type 6. If it's 8, type 0 (the number). If it's 9, type 1 (the number). Now type the second number or letter you see in the original pair (that pair should still be there). For example, if the original characters were BE, you should type 3e. The original alphanumeric pair will then move to the right.

Press the <Delete> key once to delete the original pair of characters, and then click OK. Exit the Registry Editor and restart your computer. If the ToolTips for these buttons continue to appear and you have the system set up with profiles for multiple users, try repeating the same steps at this location in the Registry: HKEY\_ USERS\.Default\Control Panel\desktop. Turn off all InfoTips: If you installed the Desktop Update portion of Internet Explorer 4, or if you're using Windows 98,

#### WINDOWS TOOLBOX Enhance Explorer With DMEXMenu

IF YOU THINK Windows Explorer omitted a few useful file management features, you're not alone. Fortunately, you don't have to get a whole new file manager. Instead, try



DMEXMenu, an extension that adds power to the right-click menu (or File menu) of Explorer by offering options specific to the selected item. From the DMEX submenu. you can quickly navigate to your favorite folders, launch batch files that send folder listings to a text file or to the printer, copy the current file (with

or without its path) to the Clipboard, or open and manage other folder windows. Best of all, DMEXMenu is free. You can download the utility from FileWorld or from www.simtel.net/simcgi-bin/win95find.cgi?dmex.

> Windows 98 SE, or Windows 2000, you may have noticed InfoTips popping up for My Computer, Network Neighborhood, and many other icons. You probably don't need Windows to remind you of the purpose of My Computer or the Recycle Bin each time your pointer pauses over them.

> You can't turn off the ToolTips for every toolbar button, but you can turn off the tips for desktop icons, folders, and file icons in one fell swoop. And this time, you don't have to edit the Registry. Open any Explorer window, and choose View-Folder Options (Windows 9x) or Tools. Folder Options (Windows 2000). Click the View tab and uncheck Show pop-up description for folder and desktop items in the Advanced settings list. Then click OK.



You can obtain the file mentioned in this article from www. fileworld.com/magazine. Find

more tips at www.pcworld.com/heres\_how. Send your questions and tips to scott\_ dunn@pcworld.com. We pay \$50 for published items. Scott Dunn is a contributing editor for PC World and a principal author of The PC Bible, 2nd Edition (Peachpit Press, 1995).

#### YOUR QUESTIONS ON: Random floppy-drive accesses • Windows' splash screen

## Stop Windows From Accessing the Floppy Drive

MY COMPUTER frequently accesses the floppy drive when there is no reason for it to do so. Do you know

how I can stop this from happening?

Ryan Satcher, via the Internet UNFORTUNATELY, there's no one cause or cure for this common annovance. But here are a few potential remedies.

At some point, you may have told Win-

dows to check for something on the A: driveand never told it to stop looking. Correcting this is easy: The next time Windows accesses your floppy drive, pop a disk into the drive. Double-click the icon for drive A:. Then close the window, doubleclick on the C: icon, and remove the floppy disk.

Your antivirus software may be configured to scan drive A: automatically,

whether there is a disk in the drive or not. To check Norton AntiVirus, for example, click the Options button. On the Scanner tab, click the Advanced button. Uncheck All removable drives. Click OK twice.

Another possibility: Something on your recent documents list makes Windows check A:. Don't bother to track down the perpetrator-just wipe out everything in that folder (you won't lose any data). To do this, right-click the taskbar, select Properties, click the Start Menu Programs tab, click Clear in the 'Documents menu' box. and then click OK.

Desktop shortcuts pointing to a file or program on A: can also trigger this pointless access. The fix: Select Desktop in Windows Explorer, and select Start-Find-Files or Folders. In the Named field, enter \*.Ink, \*.pif. Then, for the Containing Text field, enter a: and click Find Now. Delete all of the shortcuts you find, or at least move them either off of the Explorer

Desktop or out of the Start menu.

If you use Microsoft Office 97, the Find-

Fast utility could be causing the problem. To find out, select Start-Settings-Control Panel, and then double-click the FindFast icon. Once the applet is up, see whether drive A: is on the list of indexes. If it is, highlight it and select Index. Delete Index. Click OK twice, and then close FindFast and the Control Panel.

You can find more tips for dealing with this

drive access problem at www.annoyances. org/cgi-bin/ce-showtopic/005\_037.

#### **PUT AWAY THE WINDOWS** CD-ROM FOR GOOD



I'VE COPIED my Windows CD-ROM's \win98 folder onto my hard drive so I don't have to use the CD-

ROM when installing drivers or accessories. When I do something that would normally require the CD-ROM, Windows gives me an error message, and I have to show it where the files are. Is there a way to teach Windows where to look for its installation files?

Earl Taylor, Pacifica, California AS I MENTIONED in my April Answer Line column (pcworld.com/aproo/al), you don't have to pull out the Windows 9x CD-ROM every time you add or remove a Windows component. Copy your \win98

#### Pop Up 'My Computer'

WANT YOUR WINDOWS 98 taskbar to have a cascading menu to all drives, folders, and files? James Yau of Los Angeles has found a way. Right-click the taskbar and select Toolbars New Toolbar. Double-click My Computer. Slide the end of the toolbar to make it as small as Windows will allow. It will show only the words 'My Computer' and a small double arrow. Click the double arrow: You'll get a cascading menu. Open a drive or folder by right-clicking it and selecting Open or Explore. Open a file by clicking it. Shazam!

(or \win95) folder to your hard drive so that Windows can find the files there. Windows still looks for the CD-ROM when it needs one of the files and gives an error message when it can't find it.

Getting Windows to look for its installation files in the right place involves editing the Registry. As always, back up the Registry before you touch it. See May's Answer Line for instructions on this crucial procedure (pcworld.com/mayoo/al). Once your Registry is backed up, select Start-Run, enter the command regedit. and press (Enter). Navigate the left pane of the Registry Editor as if it were Windows Explorer until you get to My Computer\HKEY\_LOCAL\_MACHINE\ Software\Microsoft\Windows\CurrentVersion\Setup. In the right pane, double-click SourcePath, enter the appropriate path (for instance, c:\win98) into the dialog box, and press (Enter). Close the Registry Editor. Windows will now look for its files on your hard drive.

#### LOAD ANY PROGRAM TO THE SYSTEM TRAY

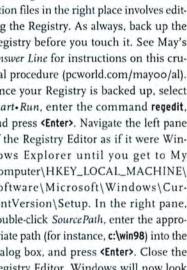


I ENJOY THE convenience of the system tray, and I have some programs I'd like to load into that area

of the taskbar. Is there a way to do it?

Steve Hwang Burbank, California

IF YOU MINIMIZE a standard application, it takes up a good chunk of space on the taskbar and is easy to access with the <alt>-<Tab> key combination. But if you



minimize a system tray app, the only way to restore it is to double-click that tiny icon in the tray. This is an inconvenient approach for most programs, but it's handy for something that you want running but out of the way.

To make a program load into the system tray even if it wasn't designed to go there, use Idyle Software's Tray Minimizer. You can download a trial version of this \$13 shareware program from FileWorld or from www.idyle.com. Tray Minimizer offers a number of ways to place a program in the tray (see FIGURE 1). You can drag a program to the Tray Minimizer icon on the desktop, or you can make 'Tray Minimize' an option when you right-click an .exe file. The best method, however, is to use the Tray Minimizer Control Center to create a special shortcut that launches your program into the tray.

When the tray-minimized program is running, it behaves normally: It's visible on the taskbar and on the <Alt>-<Tab> list. But when you minimize it, it disappears from everywhere but the tray.

The program isn't perfect—getting it to hide Outlook 97 properly was tricky-but it worked just fine with most programs I tried. And since it's shareware, you don't have to buy it till after you've tried it.

#### STOP OR CHANGE THE SPLASH SCREEN

SOMETIMES IT'S helpful to view what's going on during boot-up; on the other hand. I don't need to know

that I'm loading Windows 98. Is there some way I can remove the splash screen that

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FIGURE 1: IS MICROSOFT WORD RUNNING? With Tray Minimizer, the only clue is the Word icon in the system tray.

appears whenever Windows is booting up?

Robert Dangle Carrollton, Georgia YOU CAN TURN off the splash screen or exchange the corporate splash screen to get something more pleas-Microsoft's Tweak UI

utility for Windows (also available from FileWorld) makes turning off the screen easy. Select Start. Settings. Control Panel, and double-click Tweak UI. Click the Boot tab, uncheck Display splash screen while booting, and click OK.

If you don't have Tweak UI, then you edit msdos.sys. Select Start. Programs. MS-DOS Prompt. In the MS-DOS window, type attrib -r -s -h c:\msdos.sys (use hyphens for the dashes and make sure to leave a space in front of each one), and then press (Enter). Next, type notepad c:\msdos.sys. After you press <Enter>, msdos.sys will come up in Notepad. If the line 'Logo=1' is there, change it to Logo=0. If it isn't there, add the line Logo=0 just below the line that reads '[Options]'. Save the file and close Notepad. In the DOS window, type attrib +r +s +h c:\msdos.sys (the same as the first command, only with plus signs instead of hyphens), and press <Enter>. Close the window.

Changing the logo is harder. In Explorer, go to C:\. Select View-Folder Options (or View Options); on the View tab, select Show all files, and click OK. Look for a file

> called logo.sys; if it's there, rename it something like oldlogo. sys. Go to the graphic program of your choice and create or load the file you want to replace the old logo with. The new file should be a .bmp image file with 256 colors and sized 640 by 400 pixels.

> Resize the image to 320 by 400 (Windows' boot process stretches the file horizontally from 320 to 640). If you're using Windows' Paint, select Image · Stretch/Skew; in the Stretch section, for Horizontal, enter 50%, and click OK.

COMMAND	Effect on modem
ATMO	No sounds from modem.
ATM1	Modem makes noise until connection is established (default setting on most modems).
ATM2	Modem makes noise whenever in use (really annoying).
ATM3	No dialing sounds, but modem makes noises once number is dialed until connection is established.

ing than a Microsoft or FIGURE 2: IS YOUR MODEM MAKING TOO MUCH NOISE? Or not hardware vendor logo. enough? These commands turn your modem's speaker on and off.

When you save the file, name it C:\logo.sys. Now, the next time you boot up, you will see the image of your choice.

#### MAKE THE MODEM SHUT UP (OR SPEAK UP)



CAN I DISABLE the irritating sounds my modem makes while it dials my Internet connection?

Doug Taylor, Valparaiso, Indiana IT'S RELATIVELY EASY to turn the modem's sounds off or back on. If you have an external modem, examine it for a volume control. You can shut the modem up simply by turning the volume down. If you have an internal modem, or an external one without a volume control, you need to change your modem's setup.

Select Start-Settings-Control Panel. Double-click the Modems icon. Select your modem and click the Properties button. On the General tab, you'll see an option called 'Speaker volume' with a sliding control that you can set from the loudest level to Off. This control doesn't work with all modems, however.

If it doesn't, go to the Connection tab and click the Advanced button to bring up the 'Extra settings' field. What are called the modem AT commands control what a modem does. FIGURE 2 lists the AT commands that turn the modem's speaker on and off. After entering the appropriate command, hit OK, and you'll have an appropriately quiet-or noisy-modem.



Find files from this article at www.fileworld.com. Send your questions to answer@pcworld.

com. We pay \$50 for published items. Contributing Editor Lincoln Spector writes the syndicated humor column Gigglebytes.

#### Filter e-mail attachments • PGP public key removal • CD-R file management

## Get Those E-Mail Hoaxes Out of Your In-Box

bogu

AS FAR AS I'M CONCERNED, e-mail is just about the best reason (after EBay) to have a computer. If the people you need to get in touch with are wired like you, sending an electronic message is quicker and cheaper than mailing a letter. It's also clearer, more concise, and way cheaper than a phone call. And e-mail enables you to attach and forward electronic documents, images, links, and other messages.

That last category-forwarded electronic messages-is a decidedly mixed blessing. Say someone sends you an urgent alert about antiperspirants causing breast cancer, a dire computer virus warning, or a petition to prevent funding cuts to the NEA and public broadcasting. These issues concern you, but before you forward the message to

the Shorthaired Terrier Fanciers mailing list, you'd better check first that it isn't completely bogus. In addition to looking like a gullible dope, you'd be adding more junk to the pile of spam, hoaxes, and useless blather your hound-loving cohorts have to slog through.

Fortunately, you don't have to guess which messages are real. Numerous Web sites are dedicated to unmasking electronic fabrications that just won't die. Rob Rosenberger's Computer Virus Myths page (www.kumite.com/myths) is the first place to look when you receive a message warning about imminent widespread viral destruction. Rosenberger is merciless with self-appointed virus experts and the credulous publications that quote them (see FIGURE 1). Commercial antivirus

sites like Symantec's AntiVirus Research Center (www.sarc.com/ avcenter/hoax. html) maintain virus hoax lists.

And be sure to look at the excellent Internet Hoaxes page of the U.S. Department of Energy's Computer Incident Advisory

> Capability site at ciac.llnl. gov/ciac/CIACHoaxes. html. Check the hoax listings at these sites before forwarding a virus alert to Aunt Betty.

w.com

If the suspect dispatch in your in-box smells more like an outright scam than a hoax, it's time to consult the Internet ScamBusters at www.scambusters.org. The site tracks e-mail scams and investigates

other electronic flimflam (think EBay Furby fraud). Subscribe to the electronic newsletter at www.scambusters.com/ scambusters.html. It's free.

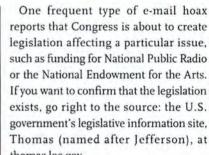
Though fascinating, urban myths take time to wade through and discard. The next time you receive a story from a "friend of a friend" claiming he had one of his kidneys stolen, go to the San Fernando Valley Folklore Society's Urban Legends Reference Pages at www.snopes.com. The organization's e-mail-hoax page is at www. snopes.com/inboxer/inboxer.htm. You can obtain information about subscribing to the Society's mailing list at www.onelist.com/group/ urban-legends.

#### Scope Out Your DSL Options

HIGH-SPEED INTERNET access via Digital Subscriber Line is here-for most of us. But DSL service may not be available in your area, usually because you reside too far from your phone company's central office switch or are served by aging or multiplexed lines. Competing DSL vendors may be eager to serve you (albeit at a higher price in many cases) and may offer DSL variations that reach farther than Ma Bell's brand. To see every DSL offering for your street address, check DSLReports at www.dslreports.com.

reports that Congress is about to create legislation affecting a particular issue, such as funding for National Public Radio or the National Endowment for the Arts. If you want to confirm that the legislation exists, go right to the source: the U.S. government's legislative information site, Thomas (named after Jefferson), at thomas.loc.gov.

Finally, here are a few other tips for identifying hoaxes: If the message was forwarded to a zillion people before it reached you-indicated by many levels of greater-than symbols (>>>>) at the start of each line-chances are it's a hoax. If it sounds too good to be true, it probably is. If it urges you to forward it to your friends, don't. Send them enough chain letters, and your friends may stop opening mail from you altogether.



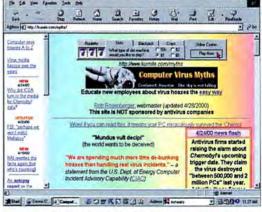


FIGURE 1: ROB ROSENBERGER'S Computer Virus Myths page dispels virus hoaxes spread via e-mail.

ILLUSTRATIONS: DOUG ROSS (LEFT); JEFFREY PELO (RIGHT)

#### FILTER INCOMING MAIL BY SIZE

HERE IN THE Virgin Islands, our phone lines are very noisy, resulting in slow connection speeds and fre-

quent lost connections. Though I ask folks not to send me large e-mail attachments, sometimes someone does. Can I put some kind of filter in to reject any messages over a certain size (like 10KB, perhaps)?

John Ellis, St. Croix, U.S. Virgin Islands YOU DON'T have to live on a small Caribbean island to want to limit the size of the attachments your e-mail program will download. I recently had to help a friend recover from a 17MB image-laden Word document attachment-a real showstopper. Both Internet Explorer's Outlook Express and Netscape Communicator's Messenger mail programs let you reject messages larger than a size you specify. Setting up the filter is easy in Messenger, but you have to know where to look. Choose Edit. Preferences, click the Disk Space branch under Mail & Newsgroups, check Do not store messages locally that are larger than, and fill in your preferred maximum message size. I'd go with something a little larger than 10KB—say 100KB, or even bigger if you usually obtain good 56-kbps modem connections. Click OK to finish.

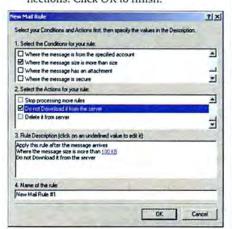


FIGURE 2: A SIZE-LIMIT RULE blocks large attachments from Outlook Express in-boxes.

To create a rule that filters out large attachments in Outlook Express 5.0, choose Tools. Message Rules. Mail, and scroll down the list of conditions until you find and check Where the message size is more than size. Then scroll down the list of actions

until you find and check Do not Download it from the server. Click the underlined size link in the Rule Description box, and set your maximum allowed message size (see FIGURE 2). Click OK twice to create the filter. Microsoft Out-

look-the personal information manager and mail application that comes with Microsoft Office-makes the task considerably easier. To filter out big messages, choose Tools. Options, click the Mail Delivery tab, and check and configure the Don't download messages larger than setting located near the bottom of the dialog box. Note: By the time you read this. Outlook Express 5.5 and Messenger 6

may both be available, and some of the steps may differ in the new versions.

#### HOW DO I RETIRE AN OLD PGP KEY?



I READ WITH INTEREST the item. about Pretty Good Privacy in the January column [www.pcworld.

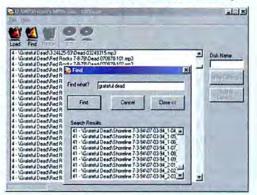
com/jan00/hh\_internet]. Some months ago I downloaded, installed, and began using PGP. I even uploaded my public key to one of the PGP keyservers so other PGP users could verify my messages and send me encrypted mail. Then I switched computers and lost track of my PGP key files. I reinstalled PGP and created a new set of public and personal keys, but I can't remove my old (and now useless) public key from the public keyservers. I don't recall my old passphrase and don't have the old keyset. How can I remove the old key from the keyserver?

Edward J. Czilli, Ann Arbor, Michigan THE SHORT ANSWER is, you can't. Not that it's a terrible tragedy. As you note, you can create a new certificate. If someone looks up your old key on the server and uses it to send you an encrypted message, you'll just have to send them an explanatory note together with a pointer to your new public key. It's important to keep a backup copy of your private key and to choose a passphrase you're sure to remember (or store it somewhere you'll

#### DOWNLOAD OF THE MONTH

#### Index CDs Quickly With CDScan

FIRST YOU FOUND THE INTERNET, then you got yourself a cable modem and a CD burner. Now you're the proud owner of about 100 CD-Recordable discs with MP3 files, digital



video, downloaded software, and the rest of the digital smorgasbord. But how do you know which disc a file is stored on?

I tried to solve this problem by writing a batch file that would snag a CD's directory listing and append it to a text file. I soon gave up on the laborious task, however. Fortunately, Mike Monti's free CDScan utility does perfectly what I need it to do. Insert a disc, enter a disc name, click the utility's Scan button, and CDScan adds the disc's directory listing to your database. You can search for a particular file name, song title, or artist, or just find out what's on disc number 37. Download the 2.2MB program from FileWorld or from Mike's site at home.mminternet.com/ ~mmonti/CDScan.htm. The current version of CDScan doesn't let you print out a particular CD's directory listing, which would be great for stuffing into the jewel case.

be sure to find it). You can create and store revocation certificates in advance to remove your public key from the server without requiring a passphrase. Should you need to create a new pair of keys, you can easily retire the public part of the old one from keyservers.



Find files cited in this article at www.fileword.com/magazine. Send your questions and tips to

nettips@spanbauer.com. We pay \$50 for published items. Scott Spanbauer is a contributing editor for PC World.

#### Automate text entry • Manage marginal text alignment • Personalize a toolbar

## The Future Is Here: Self-Typing Text

WE ALL TYPE the same things over and over in the course of our work. Whether it's a signature block in a letter or a piece of boilerplate text, there's no reason to type a recurrent set of words or paragraphs. By using the automated text-entry systems in Word 97 and 2000 and in WordPerfect 8 and 9, you can reduce duplicated effort and speed up your work. You can insert formatted text quickly by selecting an entry from a list or by typing an abbreviation and pressing a key. Here's how to latch on to these valuable tools.

#### **WORD 97 AND 2000**

TO INSERT a ready-to-use AutoText entry (Word offers dozens of them), right-click any available space on a Word toolbar or on its menu bar, and select AutoText from the list of available toolbars. Place your cursor at the desired insertion point, click All Entries on the AutoText toolbar, point at a category, and select the entry you want. Or select Insert. AutoText, point at a category, and select the entry to insert it.

- . To preview all the existing AutoTexts. select Insert. AutoText. AutoText.
- To create a new AutoText entry, type the text you want to use, and then select it. This text can be as short as a single word or as long as several paragraphs. AutoText entries store all the formatting that was present in the original text. Next click New on the AutoText toolbar, press <Alt>-<F3>. or select Insert-AutoText-New. In the Cre-FIGURE 1: WORD'S AUTOTEXT feature controls ate AutoText dialog box, type a shortcut word for your new entry and click OK. Hint: Choose a name that's easy to remember but isn't a real word you'd otherwise use. For example, if you're creating an AutoText entry for a liability disclaimer in a contract, name it something like LiabilityDisclaimer. Your new AutoText entries will be found in the AutoText list's some-

what enigmatically named Normal category.

· To create Auto-Text entries for graphics, Word fields, WordArt

objects, or any other object that Word supports, just select the object and follow the instructions listed in the previous tip. This feature lets you store logos, tables, charts, and other items for quick recall.

- · To delete an existing AutoText entry, select Insert. AutoText. AutoText, click the entry, and then click Delete and OK.
- · To arrange to have Word suggest Auto-Text automatically while you are typing an entry's shortcut name, select Insert. Auto-Text. AutoText. click Show AutoComplete



details and previews for automated text entry.

tip, and click OK. The entry name will appear as a yellow tool tip above the current line as you type. To insert the entry at any point during typing, press (Enter) (see FIGURE 1).

· To insert an AutoText entry manually, just type its name and press <F3>.

#### Move Toolbar Icons

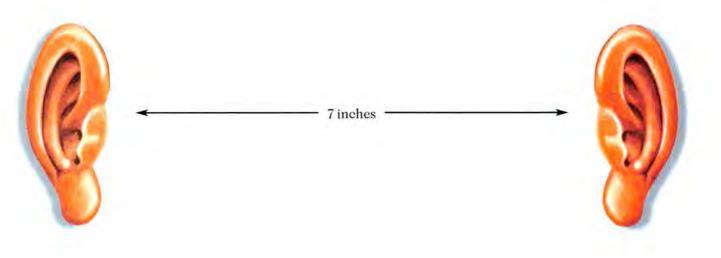
IF YOU'VE EVER wished that you could move a favorite icon from one toolbar to another, your wish can come true. Make both toolbars visible and select Tools+Customize. If a toolbar isn't visible, right-click any toolbar or the menu bar and click the one you need in the context menu. Click and drag the icon to a new location. Then click Close in the Customize dialog box.

Remember: The menu bar is also a toolbar, so you can also display your favorite icons in the empty space on the menu bar.

#### **WORDPERFECT 8 AND 9**

TO INSERT an existing QuickWords entry at the current cursor location, type the entry's shortcut word and then press <Space> or <Enter>. To select an existing entry from a list, select Tools. Quick Words. Select the desired entry from the Abbreviated form list in the QuickCorrect dialog box, and click Insert in text.

- · To create a new QuickWords entry, type the text you want to use. Its length can range from a single word up to multiple paragraphs, and the entry can include character and paragraph formatting. Select the text and then select Tools. Quick-Words. Type a name for your new entry in the Abbreviated form box, avoiding real words. For example, use FormalClose as an abbreviation for a formal signature block in a letter, or use a real word but type a punctuation character such as & in front of it. Finish by clicking Add Entry.
- In WordPerfect 9, you can create Quick-Words shortcuts for graphical objects such as logos, TextArt objects, and charts. Select the object, select Tools Quick Words, type a name for the entry in the Abbreviated form box, and click Add Entry.
- · To delete an existing QuickWords entry, select Tools. Quick Words, click on the entry in the Abbreviated form list, and then click Delete Entry.
- To rename an existing QuickWords entry, select Tools. Quick Words, click on the entry, and click Options. Type a new name for the entry in the Rename QuickWord dialog box, and click OK.



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FIGURE 2: THE QUICKWORDS tab in WordPerfect's QuickCorrect dialog box inserts text automatically.

· If WordPerfect does not insert your QuickWords entries when you type them, press (Space) or (Enter), select Tools-Quick-Words, click Expand Quick Words, and then click OK (see FIGURE 2).

#### SPLITTING LINES OF TEXT

OCCASIONALLY YOU may need to divide a line of text so that part of the line is flush with the left margin and part with the right margin. For example, in a section heading, you might put a chapter title on the left, and the section title on the right (see FIGURE 3). Similarly, it's common to split a line of text this way in headers and footers. The trouble is, your program's Help files don't tell you how to do this. Here's the technique, for Word 97 and 2000, as well as for WordPerfect 8 and 9. Word 97 and 2000: Put the cursor on the line whose formatting you want to alter.



FIGURE 3: WORD LETS YOU split a line of text to put some on the left margin and some on the right.

To set the right-aligned tab, click the small box at the left of the ruler until the symbol in the box looks like a backward letter L. Click on the ruler near the right margin, and then drag the newly inserted tab to the right as far as you can. Type the left part of the text on the line. Press <Tab> and type the right part of the text, which will automatically align with the right margin. If the text already exists on the line, position the cursor where you want to split the line, and press <Tab>.

Note: If you expect to use this alignment often, create a style for it. Select the paragraph by clicking in the left margin of a line formatted as described above. Select

Format. Style and click New in the Style dialog box. Type a name such as SplitLine in the Name box of the New Style dialog box; then click Add to Template and OK. Click Close in the Style dialog box. Now you can use this style to create divided lines any time you want.

WordPerfect 8 and 9: Type the text you want to left-align. Press <Alt>-<F7> or select Format. Line. Flush Left.

Type the right-aligned portion of the text. If the text already exists on the line, simply place the cursor at the location where you want the split to occur, and then either press <Alt>-<F7> or select Format-Line-Flush Right.

#### INSTANT HEADING STYLES

IF YOU ADOPT Word's standard heading styles for titles and subheadings in your documents, you can use a quick keyboard shortcut to apply those styles instantly. With the insertion point in the text you want to format as a heading, press <Alt>-<Ctrl>-1 for Heading 1 style, <Alt>-<Ctrl>-2 for Heading 2 style, or <Alt>-<Ctrl>-3 for Heading 3 style. Want to preview what the headings look like? Click the down arrow of the Style bar to the right of the font bar.

#### QUICK FULL MENUS **IN WORD 2000**

TO DISPLAY FULL menus in Word 2000 (or in any other Office 2000 application that uses expanding menus), just doubleclick the menu item instead of clicking once. If you want full-menu display to be the default mode, select Tools. Customize, click the Options tab, and then click next to 'Menus show recently used commands first' (see FIGURE 4).

#### CREATE A PERSONALIZED TOOLBAR

YOU CAN REARRANGE toolbars in Word 97 and 2000 by moving icons from one toolbar to another or by adding new icons, but the resulting altered toolbars can be confusing, especially in situations where several users share a single PC. Instead, create a personalized toolbar with the icons you use regularly.

Select Tools. Customize, and click the Toolbars tab in the Customize dialog box.

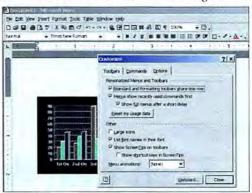


FIGURE 4: SET FULL-MENU DISPLAY as the default mode in Word 2000 via Tools • Customize.

Click New. In the New Toolbar dialog box, type a name for your custom toolbar (for example, MyBar). Click OK. The new toolbar will be in the normal dot template and will be available in all documents.

Drag the new toolbar next to an existing toolbar, and then drag it down and to the left to create an entirely new toolbar row. Display other toolbars as the need arises, clicking and dragging icons and other features from them to your new toolbar. If you discover that you need commands or icons that are not available on any existing toolbars, click the Commands tab in the Customize dialog box, find the commands you want, and drag them to your new toolbar. Click Close in the Customize dialog box, right-click any toolbar, and disable unneeded toolbars. Select All Commands in the Categories list to see a list of all available Word commands.

Send your questions and tips to george\_ campbell@pcworld.com. We pay \$50 for published items. George Campbell is a PC World contributing editor. Reach him on his Web page at www.osomin.com.

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## **Excel Charts:** The Layout of the Land

THE LAYOUT OF a chart can make a big difference in its legibility. Consider the two charts shown in FIGURE 1. Both use the same data. The top chart contains two data series, one for each region. The bottom one uses six data series, one for each month. Which is better? There is no correct answer. If your goal is to make month-by-month comparisons, the top chart is a better choice. If you want to emphasize trends in each region, the bottom chart works better.

When you create a new chart, you start by selecting the data to be plotted. Unless you tell Excel otherwise, it makes some assumptions to determine how your data is plotted. If the number of rows in your selected range exceeds the number of columns, the program uses the columns for the data series (as in the top chart shown in Figure 1). If the number of columns in your range exceeds or equals the number of rows, then Excel uses the rows for the data series.

In Step 2 of Excel's Chart Wizard dialog box, you can specify how the data will be plotted. Choose either Rows or Columns for the 'Series in' option (you'll be able to preview your choice). To change the way the data in an existing chart is plotted, select the chart by clicking it, then choose

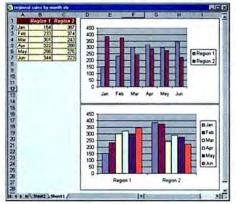


FIGURE 1: EXCEL CAN USE the same data to plot monthly regional sales in two different ways.

Chart. Source Data. In the Source Data dialog box, click the Data Range tab and then make your selection.



#### RESTRICT CURSOR MOVEMENT TO UNPROTECTED CELLS

THE FORMULAS in my worksheet use values in several input cells, I've unlocked the input cells and pro-

tected the sheet so the user can't change the formulas. Can I set things up so the cell cursor moves only to the input cells?

1. Crewes, St. Louis YES. You've already unlocked your input cells and ensured that all other cells are

locked. By default all Microrett Visual Basic - morte cells are locked, but you can change that by using the Protection tab of the Format Cells dialog box. Select the cells to be changed and choose case, the input cells

are unlocked and all other cells are locked.

Protect the worksheet in Excel 97 by using Worksheet · Protect or Tools · Protection. Protect Sheet (you can specify a password to keep others from "unprotecting" the sheet). Once the sheet is protected, press (Tab) to move the cell pointer to the next unlocked cell.

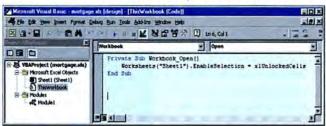
This does not prevent the user from selecting unlocked cells using the cursor keys. To make those cells unselectable, change the worksheet's EnableSelection property. Select View. Toolbars. Control Toolbox to display the Control Toolbox toolbar. Click the Properties button to display the Properties box for the worksheet. then click the cell labeled xlNoRestrictions

#### Closing All Workbooks

IF YOU FIND YOURSELF with many workbooks open at the same time, you may be interested in a "hidden" command that will close all workbooks in one fell swoop. The trick is to press (Shift) while you click the File menu. When you do so, the Close command turns into the Close All command. When you select this menu item. Excel will close all of the currently open workbooks. If any of them have not been saved, you'll get the standard prompt asking if you want to save your workbooks.

and use the drop-down list to change the EnableSelection property to xl Unlocked-Cells. Close the Properties box. As long as the worksheet is protected, users cannot select the locked cells on the worksheet.

This procedure does not save the EnableSelection property setting with the workbook. To create a simple macro that turns this setting on when the workbook is opened, press <Alt>-<F11> to activate the Visual Basic Editor. Locate your workbook name in the Project window, and double-



Format. Cells. In this FIGURE 2: THIS VBA MACRO executes whenever the workbook is opened.

click it to expand its listing. Then doubleclick the item labeled This Workbook and enter the VBA code shown in FIGURE 2. This macro executes whenever the workbook is opened and sets the EnableSelection property of Sheet1 to xl Unlocked Cells. The technique can be circumvented by changing the EnableSelection property to its default value (xlNoRestrictions). Few users know about this dodge, however.

Send questions and tips to john@j-walk. com. We pay \$50 for published items. Contributing Editor John Walkenbach is the author of Excel 2000 Formulas (IDG Books, 2000) and maintains The Spreadsheet Page (www.j-walk.com).

#### Motherboard thermometer • Reduce Windows flicker • Optimize your monitor

### The Whole Ink Jet Printer Survival Guide

LAST MONTH, I discussed keeping your laser printer in top form. This month I address how to maintain an ink jet printer.

Many of those laser tips also apply to ink jet printers-especially suggestions for speeding the printing process. Probably anyone who uses an ink jet printer for color output wants desperately to shorten printing time. Visit www.pcworld.com/ junoo/hardware to find June's Hardware Tips. (And for more ideas about speeding up ink jets, see Home Office, page 49.)

#### **HEADS UP**

INK JET PRINTERS are far less complex than their laser-toting cousins. That's because ink jet printers are basically an

updated version of that old office workhorse, the dotmatrix printer. Both ink jet and dot-matrix printers rely on a printhead that slides back and forth across the face of the paper, composing letters and images from combinations of ink dots. The smaller the dots and the greater their density, the crisper the image.

Dot-matrix printers transfer ink dots much as typewriters printed letters by striking an inked ribbon against the paper. Ink jet printers replace blows the ink through as many

as 160 tiny nozzles to form clusters of very small, precisely placed dots (see FIG-URE 1). The ink is stored in a cartridge. On some printers, only the cartridge need be replaced; on many others, however, you must change the entire printhead.

Here are tips for maintaining your printhead and the rest of your ink jet printer.

Keep your nozzles clean: Faint output, unprinted lines running across the page, or simply no visible printing at

all indicate clogged nozzles. Many ink jet printers come with a nozzle-clearing function that blows ink through the nozzles to unclog them. Use this feature regularly, especially if your printer tends to sit unused for weeks at a time.

If that doesn't clear them, you'll have to remove the printhead and clean it manually. Dampen a lint-free swab or cloth with isopropyl alcohol and gently wipe the noz-



the ribbon and mechanical let- FIGURE 1: INK JET PRINTERS may use over 160 tiny nozzles to create ter heads with a printhead that crisp, near-laser-quality images-but they may require manual cleaning.

zles to remove dried ink. Then retry the printer's auto cleaning function. If that doesn't work, replace the cartridge.

Power down properly: Always use your printer's power switch-rather than the switch on a surge protector-to shut the unit down. Many ink jet printers have a printhead parking function that's trig-

#### Is Your PC a Hottie?

THE MOST DELICATE parts of your PC are among the hardest to keep your eye on-the CPU and motherboard. A failed CPU fan or power supply fan can rapidly overheat delicate chips and fry them. To avoid this, download MotherBoard Monitor from FileWorld or members.brabant.chello.nl/~a.vankaam/ mbm (author Alex van Kaam's site). This handy program reads temperature and fan RPM data collected by your system's BIOS, displays it in Windows' system tray, and alerts you when there's trouble.

gered by the printer's own power switch. Seal your cartridges properly: Keep ink fresh by storing extra cartridges in their factory-supplied containers. If you regularly switch between color and black ink printheads, store the swapped-out cartridge in an old factory-supplied container or in a small, zip-lock bag.

Maintain your contacts: Over time, the metal contacts on the back of the print-

head may oxidize and lose their conductivity through exposure to air. Use isopropyl alcohol and a lint-free swab to keep them clean-especially if the printhead was used and then removed and stored for a long period of time.

Use the right paper: Most ink jets print reasonably well on standard, 20-pound copier paper. But the type of paper you use strongly affects the quality of ink jet output. Some grades of paper absorb too much ink, causing either too light or too blurred an image. If you want the best image possible, use the paper recom-

mended by your printer manufacturer.

Keep it clean: Periodically inspect the inside of your printer for scraps of paper or other debris. Unplug the printer, and use canned air and tweezers to remove anything that may smudge the output or otherwise gum up the works. If your printer's environment is very dirty,

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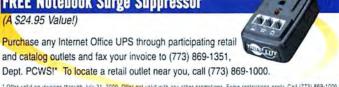


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keep a plastic cover over the printer to extend its life and minimize downtime.

Don't be jammin': Ink jets-especially lowcost, relatively flimsy ones-are sensitive to paper position and weight. Always set your paper guides carefully, and never mix paper types in the same tray.

Get the latest driver: Like laser printers, many manufacturers' ink jet models will perform better if you equip them with upto-date drivers. Find and download these drivers at the vendor's Web site.

#### MY FRIEND FLICKER?

I JUST PURCHASED a new 19-inch monitor, and I love the extra desktop space I get when working at

1280 by 1024 resolution. My graphics adapter supports up to 1600 by 1200 resolution at 85 Hz, but my screen displays an annoying flicker. I tried to increase the screen's refresh rate, but I couldn't find the refresh rate adjustment in Windows 98. Is there another way to reduce the flicker?

Robert Johnson, Chicago YOU'RE ON THE right track. To reduce screen flicker, you need to increase the refresh rate-the number of times per second a complete image is drawn on your monitor's screen. The refresh rate is measured in hertz, which is just a fancy way of saying screens per second.



FIGURE 2: SET THE REFRESH rate under Advanced in Windows' Display settings.

To avoid screen flicker, according to conventional wisdom, your PC needs to draw an image on your monitor no less than 72 times per second, a refresh rate of 72 Hz. Other authorities peg the mini-

mum comfort rate at 85 Hz. To find out what refresh rate works for your monitor (and your eyes), try different settings.

To set the refresh rate manually, go to the Settings tab under Display in Control Panel, click the Advanced button, and select the Adapter tab. If your graphics card and your monitor support multiple refresh rates, you should be able to select a refresh rate from the list, as in FIGURE 2.

If your only choice is Optimal, you are at the mercy of Windows, which takes configuration data from Plug and Play monitors and adapters and determines an optimal rate. If the refresh rate is set to Optimal, you still have screen flicker, and other refresh rate options are listed, try them. Sometimes Windows' formula for determining optimal settings doesn't establish the fastest possible rate.

Manually setting a refresh rate causes Windows to warn that you may damage your monitor if you select a refresh rate that exceeds its designed capacity. This is rarely a problem for Plug and Play monitors; but to be safe, check your device's documentation before making a change.

If-like Mr. Johnson-you can't find any refresh rate settings on the Adapter tab, Windows has determined that there's no other workable refresh rate available. Since you know that your graphics card supports higher refresh rates, your monitor probably doesn't. Check your monitor's documentation to make sure.

Even if Windows won't cooperate, you may be able increase your refresh rate. If you have a Plug and Play monitor, confirm that Windows has recognized it and installed the correct drivers. If not, the refresh rate is set automatically to a flickering and unchangeable 60 Hz. Again, go to the Settings tab under Display-or in Windows 95, look under Monitors in Device Manager-to see the name of the installed monitor. If "Unknown Monitor" is listed (see FIGURE 3), Windows couldn't find a driver for your monitor.

Click the Advanced button on Display Properties' Settings tab. On the Monitor tab, make sure that the Automatically detect Plug and Play monitors check box is checked (see FIGURE 4). If it is, you may need to install a custom driver from your



FIGURE 3: AN UNRECOGNIZED monitor's refresh rate is limited to a flickering 60 Hz.

monitor maker's Web site. If your monitor isn't Plug and Play, Windows won't recognize it and will run it at 60 Hz unless you manually install a driver for it.

The more colors you use, the more information moves through your PC and the longer the monitor takes to draw and refresh screen images. Reducing the color depth may increase refresh rates and put



FIGURE 4: FLICKER RESULTS if Windows doesn't detect your Plug and Play monitor.

new choices on the refresh rate list, but photos and other colorful images will appear less lifelike.

To reduce color depth, go to the Settings tab under Display Properties. If "True Color (32 bit)" is selected, lower it to High Color (16 bit). Except when viewing photographs, you should find this drop in color depth tolerable. Lowering color depth from High Color (16 bit) to 256 Colors, however, is a little harder on the eyes.



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### Install a New Hard Drive

JUST WHEN YOU THOUGHT YOUR PC's hard drive was big enough for any data you could throw at it, along come huge new applications that create ever larger data files. Throw in those not-so-economysized operating systems like Windows 2000 Professional, and suddenly-if you work with byte-hungry graphics, sound, or video files-you need all the storage space you can get.

As the size of hard drives continues to increase, prices stay surprisingly low. Today's standard drive is in the 13GB-to-20GB range. Also available are fast yet comparatively inexpensive drives with capacities of 30GB to 40GB. And soon you should find 6oGB and 75GB drives available-data capacities that seemed like science fiction only a year or so ago.

If your PC was manufactured in the past three to four years, you should have no problem upgrading to a super-capacity drive. Older systems may not be able to recognize the full capacity of your new drive, but you can usually overcome this limitation by updating the system BIOS. Recent PCs usually have a flash BIOS that

THE TOP DOWN Benefits: Better performance, higher capacity Costs: \$125 for 10GB, \$140 for 17GB, \$180 for 20GB, \$200 for 27GB, \$250 for 40GB Expertise level: Intermediate Time required: 1-2 hours Tools required: Phillips screwdriver, needlenosed pliers, antistatic wrist strap Vendors: IBM (www.storage.ibm.com), Maxtor (www.maxtor.com), Quantum (www. quantum.com), Seagate (www.seagate. com), Western Digital (www.wdc.com) If you need ... A drive-copy utility: DriveCopy 2.0 \$30 (www.powerquest.com) A BIOS chip: Unicore (www.unicore.com)

you can upgrade by downloading a file from your PC maker's Web site. Otherwise, you'll need to buy a BIOS upgrade chip (about \$40 to \$60).

Most new drives support the Ultra DMA/66 interface (also known as Ultra ATA/66), which can transfer data at up to 66 megabytes per second. Unfortunately, only PCs made in the past six months or so can take advantage of the full speed. PCs made within the past three to four years but not within the past half-year use the UltraDMA/33 interface, and systems older than that have an even slower version. All UltraDMA/66 drives will work with the older interfaces, but they won't work at full speed.

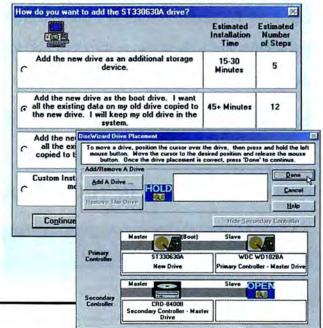
Your new drive will be faster than your current drive, so plan on using the new drive as your C: drive, and the old one as your D: drive. Copying the data from your old hard disk to the new one is a breeze if you use the utilities shipped with virtually all new drive kits. Alternatively, you can buy a separate drive-copy utility, such as PowerQuest's DriveCopy. Note that trying to copy files using DOS commands such as DISKCOPY and XCOPY won't work because they will not copy the essential hidden and system files.

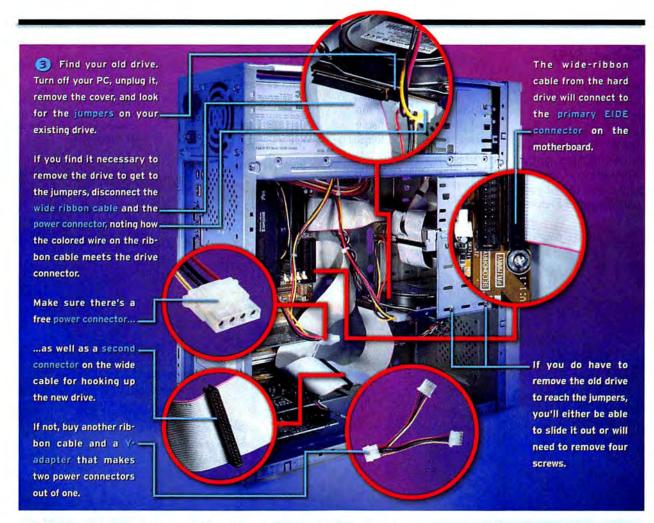
Stan Miastkowski is a contributing editor for PC World.

1 Prepare your existing hard drive. It's essential that your existing drive be trouble-free. Run ScanDisk (Start+Programs+Accessories. System Tools. ScanDisk), and then run Disk Defragmenter (Start\*Programs\*Accessories\*System Tools\*Disk Defragmenter). IMPORTANT: To protect your data in case anything goes wrong, make a full backup of your hard drive before you go any further.



Run the software. Depending on the type of drive-copy or diskpreparation software that accompanied your drive (or that you purchased separately), either install and run it from within Windows or boot the floppy disk. Follow the directions (which vary by maker).





A Set the drive jumpers. When two EIDE drives are connected to a single cable, one is designated 'Master', the other 'Slave'.

Most drives have jumper settings printed on them. If yours doesn't, consult the manual that came with it. In a pinch, you can

find jumper settings on the drive maker's Web site.

Set the jumper on your new drive to Master, and then adjust the jumper settings Identified on your old drive to Slave.

6 Put it all back together. If you had to remove your old drive in step 3, reinstall it now. Then mount the new drive above or beneath the old drive.

Attach the two connectors on the ribbon cable to the old and new drives. (It doesn't matter which connector goes with which drive.) Make sure the colored wire on the cable goes to pin one. Confirm that the other end of the cable is securely connected to the motherboard.

Plug the power connectors from the power supply into both drives.

(mm:dd:yy) (hh:mm:ss)

6 Check the BIOS and copy the data. Make sure your disk-preparation floppy is in the drive, and turn your PC on. Enter your PC's setup program and check that the BIOS for drives 1 and 2 is set to Auto so it will automatically detect the two drives and set up the correct parameters. Save the setup settings and reboot from the floppy disk. Follow the disk's directions to copy all data from the old drive to the new.

After you're done, reboot your PC. It should start Windows normally. When you're sure everything is working properly, reformat your old drive (it no longer needs to be bootable, of course) to prepare it for new data.



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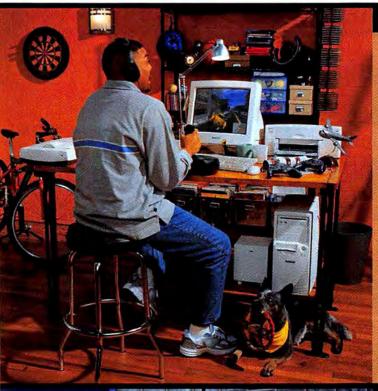
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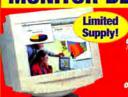


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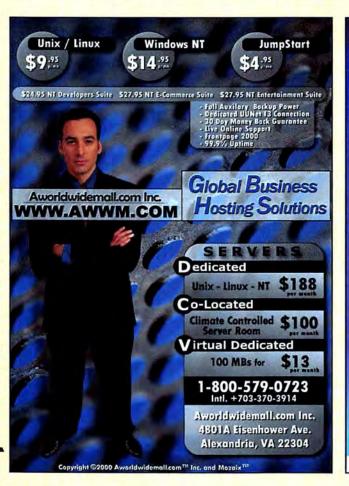






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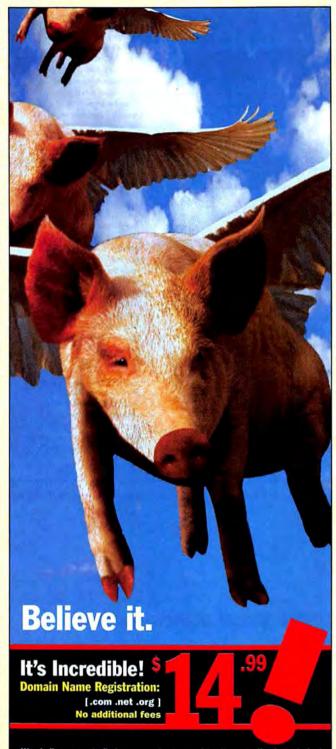
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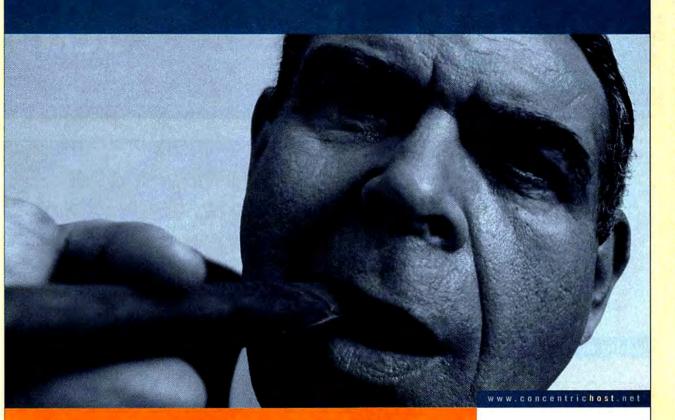
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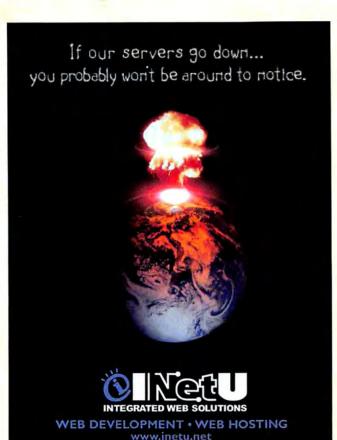


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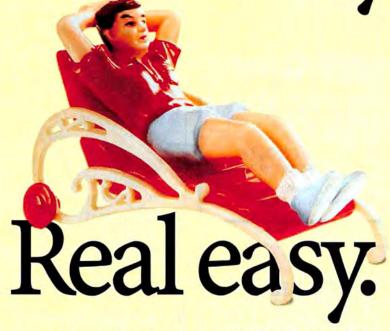
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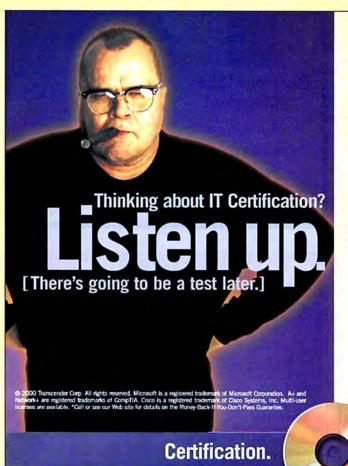
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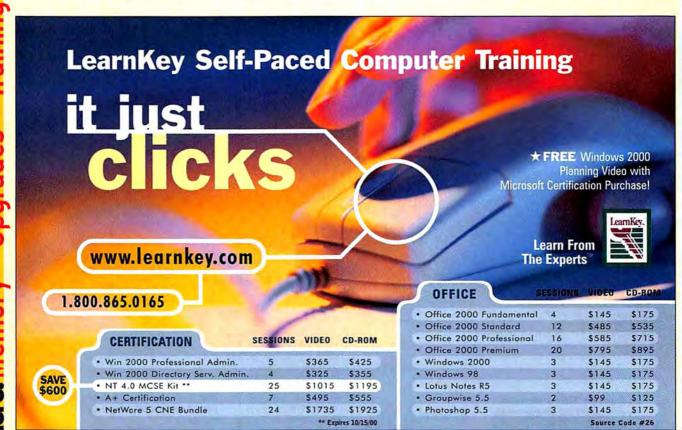
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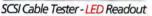
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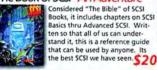


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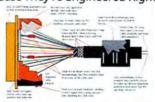
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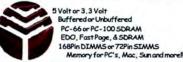
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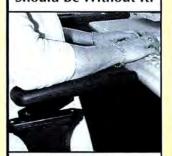
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# On the Go, On the Web

THE WEB HAS BECOME indispensable to my travel planning. But even the best travel sites still remind me of a meal at a Hong Kong dim sum parlor: Though the parade of dishes is impressive, some of the tastier items are hidden from view or totally unavailable, and some of what you get is not quite what you expected. "Travel Web Sites: Just the Ticket?" (on page 157) outlines some of the

pitfalls as well as the benefits. Here are a few strategies I've learned in my own virtual peregrinations toward real-world travels.

Hug dead trees: Even when an entire guidebook is available on the Web for free, as the Rough Guides series claims to be, navigating from one screen of info to another can be awkward. Starting out with paperbound guides can help narrow your search for hotels, restaurants, and transportation. The Web may eventually lead to better options, but the books' suggestions should help focus your efforts.

Search in all directions: Finding something as straightforward as the seat map for a flight can end up being infuriatingly difficult. Persevere: If you suspect that it's on the Web, it probably is-somewhere. Keep multiple browser windows open to compare deals; they can differ wildly. By visiting the sites of hotel middlemen, I've gotten deals much better than those avail-

able at the likes of Travelocity-saving me hundreds of dollars a night in cities such as New York, San Francisco, and Boston.

Chart your voyage: Though Web-based maps are notoriously inaccurate, they're better than nothing. Use them to help decide whether your hotel is near the action or 10 miles from nowhere. Take roads less traveled: The best-known travel sites are okay if you're looking for a standard room in a chain hotel. But I've used the Web to track down obscure sites for everything from condominiums in Hawaii to lodgings in central Rome. Open yourself to serendipity by exploring multiple search engines and following links from the sites they tease out.



I've used the Web to track down everything from condominiums in Hawaii to lodgings in central Rome.

Study the pictures: Guidebooks rarely show you what accommodations look like; Web sites often do a fine job. I've booked rooms and condos on little more than shots of the views and décor-and eliminated hotels whose sites suggested an ambiance of unremitting gloom. So far it's worked, perhaps because I always assume the pictures put the prettiest possible spin on things. If all you see is a faded patio chair overlooking three plastic dandelions, then that's as good as it will get.

Think local: City-oriented sites can be maddeningly boosterish, but they do provide a currency that guidebooks just can't match, particularly when it comes to festivals and cultural events. The sites of local newspapers and alternative weeklies often do a better job with restaurant and drama reviews and can give you a truer sense of a town's spirit.

Try public utilities: Don't forget other people's computers-the ones in Internet cafés and (in some countries) post offices can be handy for keeping in touch. Also handy are local ATMs, still the most effortless way to change money, and, despite their fees, often the cheapest short of using a credit card.

Assume nothing: When you think you've latched on to the best deal possible, think again. I've often found significantly lower airfares on a given itinerary simply by restating my query slightly. And no one will tell you what information has been left out-like, say, Southwest Airlines' entire schedule, missing from Expedia.

#### WHEN THE PHONE DOES IT BETTER

THANKS TO BITTER experience attempting to redeem frequent-flier miles or get seat assignments online, I've given up on the airlines' sites for those chores. A phone call almost always

reveals options unavailable via the Internet.

And that's the real Web challenge: Figuring out when picking up the phone makes more sense than surfing for what you want, as it often still does. But as a veteran of the days when reserving a room abroad meant weeks of uncertainty as special money orders and hand-scrawled confirmations crossed in the mail, I'll take the electronic era anytime.

PC World Contributing Editor Stephen Manes is cohost of Digital Duo, a series appearing on public television stations nationwide. For program information, see www.digitalduo.com.

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- Internal 56K Capable SoftModem
- 1-Yr Next-Business-Day On-site Service\*

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BUSINESS LEASE: \$41/MO., 48 MOS." Upgrade to 14.1" Active Matrix Display,

add S250

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#### DELL™ POWEREDGE™ 1300

Affordable Entry Level Server

- Intel\* Pentium\* III Processor at 600MHz (up to 800MHz)
- Dual Processor/RAID Capable
- 64MB 100MHz ECC SDRAM (up to 1GB)
- 9GB<sup>5</sup> 7200 RPM Ultra2/LVD SCSI HD (up to 36GB<sup>5</sup>)
- 108GB Internal Storage Capacity
- NIC & Integrated SCSI Controllers; 40X Max CD-ROM
- Dell "OpenManage" Server Management Solutions
- 3-Yr NBD On-site Service<sup>1</sup>; 7x24 Phone Support

\$ 1599 @ E-VALUE CODE 03762-290615

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

- Microsoft\* Windows\* 2000 Server, add \$799
- Second Intel® Pentium® III Processor at 600MHz, add \$599

#### DELL™ POWEREDGE™ 2400

#### Workgroup Server

- Intel® Pentium® III Processor at 600MHz (up to 866MHz)
- Dual Processor Capable
- 64MB 133MHz ECC SDRAM (up to 2GB)
- 9GB<sup>5</sup> 7200 RPM Ultra-2/LVD SCSI HD (up to 36GB\*)
- Up to 180GB Hot-swappable Internal Storage Capacity
- Integrated NIC/SCSI Controllers; 40X Max CD-ROM
- Dell' OpenManage Server Management Solutions
- 3-Yr NBD On-site Service<sup>4</sup>; 7x24 Phone Support

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BUSINESS LEASE: \$69/MO., 48 MOS."

- Single-channel RAID with 64MB Cache, add \$299
- Red Hat\* Linux 6.2, add \$149

#### DELL" PRECISION" 420

Advanced Performance Workstation

- Intel® Pentium® III Processor at 667MHz (up to 866MHz)
- Dual Processor/RAID Capable
- 128MB PC600 RDRAM (up to 1GB)
- 20.4GB 7200 RPM EIDE HD (up to 36GBs 10K SCSI)
- 17" (16.0" vis) M781 Monitor
- 32MB 4X AGP Synergy Force Graphics Card
- Integrated NIC & Sound; 48X Max CD-ROM
- NEW Microsoft\* Windows\* 2000 Professional
- 3-Yr Next-Business-Day On-site Service\*
- 7x24 Dedicated Workstation Phone Tech Support

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#### DELL™ HOME NOTEBOOKS:

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- 64MB SDRAM 7.5GB3 Ultra ATA Hard Drive
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- Intel® 3D® AGP Graphics
- 48X Max CD-ROM Drive
- SoundBlaster 64V PCI LC Sound Card
- PC Speakers
- V.90 56K Capable PCI DataFax Modem for Windows\*
- MS\* Works Suite 2000
   MS\* Windows\* 98, SE
- 3-Yr Limited Warranty = 1-Yr At-Home Service

\$899 © E-VALUE CODE 03762-500608



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#### Design and Affordability

- Intel\* Celeron Processor at 450MHz
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- 32MR SDRAM
- 4.8GB Ultra ATA Hard Drive
- Modular 24X Max CD-ROM
- 2X AGP 8MB ATI RAGE Mobility "-M1 3D Video
- 3D\* Positional Sound with Wavetable
- 53WHr Lithium Ion Battery with ExpressCharge™ Technology
- MS\* Works Suite 2000 MS\* Windows\* 98, SE
- 1-Yr Limited Warranty'
- 1-Yr Next-Business-Day On-site Service\*

4.4.9 @ E-VALUE CODE 03762-800614



As low as \$40/Mo., for 48 Mos.

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- 17" (16.0" vis, .26dp) M780 Monitor
- 32MB NVIDIA TNT2 M64 AGP Graphics
- 48X Max CD-ROM Drive
- Turtle Beach Montego® II A3D 320V Sound Card
- harman/kardon Speakers
- V.90 56K Capable<sup>6</sup> PCI Telephony Modem for Windows\*
- MS\* Works Suite 2000 MS\* Windows\* 98, SE
- 3-Yr Limited Warranty = 1-Yr At-Home Service

E-VALUE CODE 03762-500614m

As low as \$41/Mo., for 48 Mos.

#### DELL™ INSPIRON™ 5000

#### Performance and Mobility

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- 32MB SDRAM
- 6.0GB<sup>s</sup> Ultra ATA Hard Drive
- Modular 32X Max CD-ROM
- 2X AGP 8MB ATI RAGE Mobility "-P 3D Video
- 3D\* Positional Sound with Wavetable
- 52WHr Lithium Ion Battery
- Internal V.90 56K Capable Fax Modem
- MS\* Works Suite 2000 MS\* Windows\* 98, SE
- 3-Yr Limited Warranty
- 3-Yr Next-Business-Day On-site Service\*

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- Intel® Pentium® III Processor at 866MHz
- 128MB RDRAM 40GB\* Ultra ATA Hard Drive
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- 32MB NVIDIA geFORCE 4X AGP Graphics
- 12X Max DVD-ROM Drive
- SB Live! Value Digital
- Harman Kardon HK-595 Surround Sound Speakers with Subwoofer
- V.90 56K Capable<sup>6</sup> PCI Telephony Modem for Windows\*
- MS\* Works Suite 2000 MS\* Windows\* 98, SE
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E-VALUE CODE 03762-500623m

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#### Performance and Mobility

- NEW Intel® Pentium® III Processor at 700MHz Featuring Intel® SpeedStep® Technology®
- 15" Super XGA+ TFT Display
- 96MB SDRAM 12GB Ultra ATA Hard Drive
- Modular Removable 8X2 Max DVD-ROM Drive
- 2X AGP 8MB ATI RAGE Mobility "-P 3D Video
- 3D\* Positional Sound with Wavetable
- 52WHr Lithium Ion Battery
- Internal V.90 56K Capable Fax Modem
- MS\* Works Suite 2000 MS\* Windows\* 98, SE
- 3-Yr Limited Warranty<sup>2</sup>
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- Turtle Beach Montego\* II A3D\*\* 320V Sound Card
- harman/kardon Speakers
- V.90 56K PCI Telephony Modem for Windows
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