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2 GHz Pentium 4 Desktops by Bill O'Brien
Combining Intel's 2GHz Pentium 4 processor, 256MB of RDRAM, a GeForce3 graphics card, and other top-shelf components is a sure-fire recipe for computing speed. But what may be most impressive about these five screamers is their affordable pricing.

ABS Performance B • Dell Dimension 8200 • HP Pavilion 9900 • MicronPC Millennium Max X5 Polywell Poly 850GB-2000

Rock-Solid Sound
Three-piece Speaker Systems by Dan Labiola
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To be a true CD-burning ace, you need tools to edit, finesse, and package your discs' content. The software bundled with your CD burner isn't going to cut it—see which of these five programs are up to the task.

Click 'N Burn Pro 2.0 • Easy CD Creator 5 Platinum • Nero Burning ROM 5.5
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The Digital Beat Goes On
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In Napster's wake, the major record labels are letting users download digital music for a fee. But several Napster-like services offer the same thing—for free. The battle for the hearts, minds, and wallets of digital-music fans is underway.

Come Out on Top When Your Vendor Goes Under
Vendor-Bankruptcy Survival Tips by Rick Broida
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Home Sweet Office
Telecommuting Essentials by Rob Schenk
Set up a smart infrastructure for telecommuters, and you could achieve a rare win-win: saving your company money and boosting employee morale. Our guide's wealth of products and tips will help you keep your remote workers connected.

Trends
Free local Wi-Fi networks come out in the open—and under fire. Also, Microsoft makes inroads into the long-distance-calling market, E-Trade expands its presence in Wal-Mart stores, and an R&D firm kicks in plans for electricity-generating boots.

Gear
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• Logitech ClickSmart 310
• Kensington PocketMouse Pro
• Saitek Cyborg 3D Force Stick
• Crumpler Very Busy Man Laptop Bag
• Panasonic e-Wear SV5080
• Motorola i90c Limited Edition

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What's New in 2002

Now that the holiday season has officially come and gone, it's time to look at what's in store for 2002. The year has barely begun, but it's already clear that the battle between AMD and Intel will continue to escalate. Though 2001 was a tough year for the PC market, AMD managed to increase its market share significantly, leaving Intel scrambling to stay on top.

For the moment, Intel still holds the clock-speed crown with its Pentium 4. At press time, PCs powered by Intel's 2GHz chip were the fastest we'd tested, but keep your eye out in coming months for reviews of new AMD Athlon XP-based systems. Though they run at slower clock speeds, the XP 1800+ and 1900+ are poised to give the 2GHz Intel chip a hard run for its money in actual performance. Still, speed freaks won't be disappointed by any of the five 2GHz Pentium 4 boxes we tested this month. With Intel slashing prices and RDRAM selling at all-time low prices, you can snap a cutting-edge system without breaking the bank. Turn to our feature story "The Fast Five" (p. 102) to find out which of these screamers fits your bill.

Most of the PCs in our roundup came outfitted with excellent sound systems. But those of you still suffering with the tinny speakers bundled with older desktops will want to read our comparison of three-piece speaker systems. If you haven't shopped for speakers lately, you'll be pleased to discover that you can get wall-shaking sound for well under $200. In "Rock-Solid Sound" (p. 112), we put five three-piece satellite-subwoofer sets to the test and found that spending more doesn't always buy you more.

Once you're outfitted with some decent woofer and tweeters, you'll want to build up your digital music collection. Since Napster effectively shut down in the middle of last year, though, the online music scene has been harder to navigate. But don't underestimate the power of consumer demand; 2002 promises to be the year digital music grows up. With the file-sharing heirs of Napster squaring off against for-pay services backed by major record labels—including a subscription version of Napster coming soon—there are more places than ever to find downloadable tunes. Don't miss "The Digital Beat Goes On" (p. 132), our guide to online music. We'll help you navigate the various sites and services, and show you where the music's free and where you'll pay a fee.

Because most PCs come equipped with CD-RW drives these days, burning those MP3s onto CDs has become easier than ever. If you plan to record CDs on a regular basis, however, you'll probably want a more powerful CD-mastering application than the basic version bundled with your drive. In "Disc Masters" (p. 128), we take a closer look at some of the best CD-mastering programs to cross our radar screen, and give you the scoop on which offer the most for your money.

Finally, if you don't have a CD-RW drive—or are looking to upgrade—be sure to check out our "Buying Advisor" column on p. 170. Starting this month, veteran tech shopper Alice Hill (of "Hard Edge" fame) dons the mantle of Advisor. This month's challenge was finding an easy-to-install, easy-to-use CD-RW drive for under $200, which our new Advisor handled with aplomb.
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welcome new users.
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WHEN IS A CD NOT A CD?

I was dismayed and offended by the brief write-up on supposedly “unrippable” CDs in the December issue (“Revenge of the RIAA: Dupe-Proof Audio CDs,” p. 23). The piece makes it sound as if only the “cracker underground” is interested in ripping music from CDs. Copying music from a CD I purchased to another device of mine is supposedly protected by fair-use laws. Even if that wasn’t the case, many of these copy-protected CDs still bear the “Compact Disc” logo. This is fraudulent advertising. The method of making the disc “impossible” to copy violates the compact-disc standard, and by using that logo, the companies are misrepresenting the product to consumers. It’s not a compact disc if it can’t be read by all my CD devices.  

Thomas Hochmann

HAPLESS HANDHELDs

Your December issue was an interesting read. I enjoyed John Blackford’s column on Microsoft monopoly techniques (“Avoid Software Dependency: Just Say No to Microsoft,” p. 46). His wariness of a company like Microsoft is valid; neither Microsoft nor Bill Gates has ever been modest in business ventures. However, John Dvorak’s column, “The Handheld as Desktop” (p. 52), was unrealistic. He speaks of future handhelds having multipurpose I/O ports and possibly a docking bay to attach a screen and keyboard. But even with the 6GB hard drive, which doesn’t exist yet for these machines, you can’t run even half the subdevices and programs he discusses. If you installed Windows, for instance, you’ll munch up almost a gig or more immediately.

The magical device that replaces a desktop is already here; it’s called a notebook. You can take it anywhere, and it already has a screen and keyboard built in, not to mention more than adequate hard drives. Until handhelds gain the technology to at least surpass the 20GB hard drive mark, they’ll forever stand in the shadow of laptops and desktops.  

Fairweather T. Sees

A RAZER-SHARP MOUSE

I take issue with your assertion that the Microsoft Wireless Intellimouse Explorer “offers smoother cursor movement, more accuracy, better software, and greater comfort than all that have come before” (January, p. 72). Obviously, the author has never used a Razer Boomslang 2000 (www.razerzone.com).

Lots of people say Boomslang mice aren’t ergonomic, that they’re too heavy, that the ball’s too far back, and so on. But in the end, the Boomslang 2000 is the single smoothest, most precise mouse on the planet. Yes, optical mice are often smoother and more precise than ball mice, but nothing in existence even comes close to the smoothness and accuracy of the 2000.  

Rob Martens

CORRECTION

In the sidebar “Holiday 10 Most Wanted” (December 2001, p. 140), we pictured the Olympus Brio Zoom D-150 in place of the Camedia D-S10 Zoom. Also, in the December News story, “For AMD, XP is ‘Extra Performance’” (p. 23), AMD’s XP acronym stands for “Extreme Performance.”

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MSN Messenger Lets Your Voice Go the Distance

When Microsoft (www.microsoft.com) launched Windows XP, the company got into the long-distance business. The software titan won’t call during dinner to ask you to switch carriers, but new MSN Messenger instant-messaging application makes voice calls to telephones.

During its PR blitz for Windows XP, Microsoft offered the free Windows Messenger update as evidence that XP is a good platform for third-party applications—a point it’s probably eager to prove after being accused of bullying during its antitrust trial.

To that end, Microsoft partnered with five Voice over Internet Protocol (VoIP) providers: Dialpad Communications (www.dialpad.com), which boasts 14 million users; telus (www.telus.com), CANADA’s second-largest telecom company; U.K.-based CallServe (www.callservice.com); Deltathree (www.deltathree.com); and Net2Phone (www.net2phone.com). Dialpad offers prepaid, per-minute plans for $10, $25, and $50, competitive domestic and international rates (like 8 cents per minute to Japan), and no monthly fees. Other partners offer similar plans and rates.

Maybe Microsoft wants to make customers’ lives more convenient with its Messenger moves, but other theories abound. The company certainly is trying to boost demand for its new operating system. And some experts theorize that Microsoft is trying to get one step ahead of rival AOL Time Warner (www.aoltimewarner.com). AOL Instant Messenger, the most popular instant-messaging app, currently doesn’t offer computer-to-telephone calling.

Or the telephony push may be part of what IDC analyst Dan Kusnetzky calls Microsoft’s successful strategy to “realize some revenue for every use of computers.” But he adds that consumers and organizational users may not go along with the company’s quest to have a finger in every pie.

It also remains to be seen whether consumers will find PC telephony as easy, convenient, or necessary as Microsoft hopes.

Prepaid calling card, anyone?

—Jen Muehlbauer

Step Up the Power

Everyone knows that taking a stroll can be energizing, but SRI International (www.sri.com) aims to put that energy to use. SRI, a non-profit research and development organization, is working with the Defense Advanced Research Projects Agency to develop a boot that generates electricity every time your heel hits the ground.

Using technology that would make Maxwell Smart envious, the boot employs a heel constructed of electricity-generating plastic, called electroactive polymer (EP). Although EP sounds exotic, you can find similar material at your local hardware store, says Ron Pelrine, director of SRI’s advanced transducers program. When pressure is placed on the material during a heel strike, the polymer stretches. The plastic contracts when you lift your foot, pushing positive charges away from negative charges, creating electricity that’s stored in a small battery. Although the experimental shoe won’t light up Broadway, it does generate enough electricity to power small equipment, such as radios and cell phones—a weight-saving benefit for soldiers in the field who currently rely on heavy batteries for juice.

—Atticus Fisher

Modern Art by Modem


Art lovers will find more than 120 German expressionist woodcuts, lithographs, and intaglios from the museum’s collection. Macromedia’s Flash plug-in and an appreciation of abstract expressionism are required.

MOMA puts abstract art online.
**TRENDS**

**No Profit in Privacy?**

Would you pay to protect your identity as you send e-mail or surf the Web? Zero-Knowledge Systems (www.zeroknowledge.com) found that many Web users declined to invest in invisibility.

Last October, citing high operating costs and drooping demand, ZKS discontinued its Freedom Network, which let you use the Internet anonymously by bouncing encrypted packets across a network of more than 100 servers.

Nonetheless, ZKS and analysts see a continued demand for Web-security software. The Freedom Network foundered because most customers didn’t want or need the level of security that it offered, says Hamnett Hill, ZKS executive vice president. Instead, they preferred a product that was easier to use and addressed day-to-day threats, such as hackers and cookies. To that end, ZKS launched Freedom Privacy & Security Tools 3.0, which includes a personal firewall, a password manager, and blockers for ads and cookies.

Other companies, including Anonymizer (www.anonymizer.com), SafeWeb (sfgu.safeweb.com), and Zones Labs (www.zone labs.com), have seen strong demand for their Web-security and privacy products.

“There is a lot of spending on Web security going on, and it is growing,” says John Pescatore, vice president and research director of network security at Gartner.

The problem with the Freedom Network, says Pescatore, was that most Web users could achieve a certain level of anonymity by setting up a free e-mail account with Yahoo Mail (mail.yahoo.com) or Hotmail (www.hotmail.com). Also, the increasing attention paid to privacy concerns by major Internet vendors has decreased the fear of compromised privacy. In the end, he adds, only two classes of user really need to pay for anonymity: “criminal elements and perverts.” —Elaine X. Grant

**Socks, Underwear, And 100 Shares of IBM**

Online isn’t the only place to be anymore. Even quintessential Web-based companies like E-Trade (www.etrade.com) are showing increased enthusiasm for the boring old brick-and-mortar world.

This year, E-Trade and merchandiser Target will open new E-Trade Zones in 22 Target stores. The Zones are manned by E-Trade customer-service representatives and equipped with terminals that allow users to get information, open accounts, make trades, and access stock quotes and financial news. The new E-Trade Zones bring the total to 43 Zones in Target stores in nine states.

The arrangement is a boon to Target, which can market itself as a store where customers can do their shopping and manage their finances all in one trip. That, says Jerry Coy, vice president of strategic marketing at Target Financial Services, is a plus. “It’s beyond what guests would expect in a typical retail environment,” he says.

For its part, E-Trade sees the Zones as a less expensive way to get new business, gain exposure to the mainstream market, and offer a personalized customer experience.

It may seem like a strange partnership, but IDC analyst Shaw Lively says it makes good sense. “It may work out for both of them,” says Lively, who points out that a few years ago, ATMs in supermarkets seemed like an odd idea. “Nobody thought supermarket banking would be what it is today,” he says.

E-Trade Zones are also part of a trend among online brokerage firms to offer customers nonwired ways to use their services. “There aren’t very many pure online companies left,” Lively says.

Another reason the arrangement might yield good results is that E-Trade offers services that extend beyond trading, such as mortgages and personal banking. “You won’t necessarily go into Target to make a trade, but you might pay a bill or check a balance,” Lively says.

—E. X. G.

**ReturnValet to the Rescue**

With the launch of ReturnValet (www.returnvalet.com), Newgistics aims to transform unwanted merchandise ordered online or through catalogs into many happy returns for all involved.

“How returns are handled will color a customer’s view of the entire company,” says C.J. Gabriel Jr., president and CEO of Newgistics.

The service rolled out in New York, Chicago, Dallas/Fort Worth, Los Angeles, and Atlanta last year. The ReturnValet Web site points users to the nearest return location—usually a mail or parcel store—in their city, and even provides a map and driving directions.

Customers simply return merchandise purchased from a participating retailer to a partner location, and a receipt is issued for the purchase, exclusive of shipping charges.

Until its national rollout in early 2002, the service works only with the Spiegel Group’s Eddie Bauer, Spiegel, and Newport News retailers. Additional retailers such as Lillian Vernon and Sincerely Yours will participate starting in early 2002.

Sounds like a great service, but not everyone sees the value. Forrester Research analyst Christopher M. Kelley says most Web buyers who have returned a product report that it was just as easy as returning a purchase made offline. —Gwen Moran

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- Built-in Touchpad Pointing Device
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Trends

Broadband to The People

Wireless broadband is a laptop owner’s dream—come true—if you have the money to pay for it. Now, with an 802.11b (Wi-Fi) wireless communication card in hand, you may be able to grab a free, speedy Net connection from a park bench, coffee shop, or even your apartment. Some broadband users are creating neighborhood Wi-Fi access points, making wireless broadband available, for free, to anyone within signal range.

Finding a free wireless network can be tricky. The Bay Area Wireless Users Group (www.bawug.org) publishes a list of open networks in the San Francisco Bay area, as well as links to other lists nationwide. Another resource is FreeNetworks.org (www.freenetworks.org).

It’s also possible to stumble upon a Wi-Fi network while walking or driving, though it can be hard to tell if it is open to the public. “Many of us are encouraging people to use ‘open’ as part of the network ID in open networks,” says Cliff Skolnick, who maintains the Bay Area list.

Skolnick also encourages home broadband users to consider providing wireless access to their communities. “Why not share a resource that does not have any incremental cost?” he asks.

Sharing your home Internet connection may be generous, but it may not be legal. The terms of service for many residential broadband access providers prohibit distributing access to others. “So-called ‘free-nets,’ where someone sets up an unauthorized wireless way to hook up friends or family members without charge, is contrary to our service agreements,” says Mike Luftman, vice president of corporate communications for Time Warner Cable, owner of broadband service provider Road Runner. “It is the same thing as cable theft and is against the law.”

Skolnick agrees. “It’s shortsighted for people to not follow the acceptable-use policy of their ISP,” he says. “You can get a DSL ISP that does not have these restrictions, or business-class service with less restrictive policies.”

Having your broadband provider threaten legal action isn’t the only hazard. Sharing your connection is a potential security risk to your data, so you’d need to turn off file and printer sharing. —Kevin Sovetz

GPS for Speed Demons

You might not be smiling if you’re caught on candid camera—a traffic camera, that is. To help drivers avoid unwanted portraits, a British company has created a device that warns them when they’re nearing “speed cameras,” which snap photos of speeding vehicles.

Morpheous’ Geodesy device (www.morpheous.co.uk) uses Global Positioning System (GPS) satellites to track a car’s location and compare it to a database of known speed traps. Lights and a buzzer warn you when you’re within a mile of a speed camera.

The company has sold about 10,000 units in the United Kingdom, Belgium, and Germany. You won’t currently find the Geodesy, which costs £350, or around $500, on an American dashboard, but the company hopes to release it in the United States.

Traffic cameras are a bigger issue for European drivers than for those in the States, where such cameras are used almost exclusively to catch drivers who run red lights.

The Geodesy would alert drivers to the red-light cameras in the more than 60 U.S. communities in which they are deployed, and it would be legal. Conventional radar detectors are legal in noncommercial vehicles (except in Washington, D.C., and Virginia). Because the Geodesy detects nothing but the car’s position, current legislation would not outlaw its use.

Officer Jason Lee, a spokesman for the Los Angeles Police Department, believes the gadget would be of limited usefulness, however. “There are other ways to get caught,” he says. “There are estimating speed, pacing, and other ways to catch speeders—for their safety and the safety of others.”

—K.S.
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- Trident Blade 3D Shared AGP
- Luent PCI 56K Voice Modem
- PCI 3D Wavetable Stereo Sound
- Atlas 440i 2.1 Speakers w/Subwoofer
- AMD Certified Power Supply

$659
PS8000
Athlon XP 1700+ Processor with QuantiSpeed™ architecture
- New VIA KT686A DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC16002100 and 4X AGP Support
- 256MB PC2100 (66MHz) DDR RAM
- 40 GB UDMA-100 Hard Drive
- 56K DVD-ROM
- Nvidia GEFORCE 2 MX400 DVD 3D 64MB
- Luent PCI 56K V.90 Voice Modem
- SoundBlaster PCI 128 4-Channel 3D Wavetable
- MLA-452 4.1 Ch. Speakers w/Subwoofer
- AMD Certified Power Supply

$899
AS6000
Athlon XP 1800+ Processor with QuantiSpeed™ architecture
- New VIA KT686A Enhanced DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC16002100 and 4X AGP Support
- 256MB PC2100 (66MHz) DDR RAM
- 40 GB UDMA-100 Hard Drive
- 56K DVD-ROM
- Nvidia GEFORCE 2 TI 3D DVD 64MB DDR
- Creative Labs Modem Blaster PCI V.90 Modem
- SoundBlaster Audio 5.1 Sound and PCI1394 Firewire port
- Creative Labs Inspire 5.1 5300 Speakers w/Subwoofer
- AMD Certified Power Supply

$1,199
AS8000
Athlon XP 2000+ Processor with QuantiSpeed™ architecture
- New nVIDIA nForce Twin Bank DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC16002100 and 4X AGP Support
- 256MB PC2100 (66MHz) DDR RAM
- 64 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- Nvidia GEFORCE 3 Ti 200 3D DVD 64MB DDR
- Forza 10/100 Ethernet Card
- Creative Labs Modem Blaster PCI V.90 Modem
- Forza APU 3D Dolby Digital 5.1 Certified Sound
- Creative Labs Inspire 5.1 5300 Speakers w/Subwoofer
- Microsoft Intelli Mouse w/Wheel
- 350W AMD Certified Power Supply

All Atlas Micro PCs include:
There should be a picture in the dictionary of the Atlas Micro X55000 under the heading “Price/Performance.” This desktop system was one of the best performers we’ve ever seen. Yet, it costs about $1,000 less than the other high-end Athlon desktops reviewed here.

Mr. David English

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$469

CS6000

Intel Celeron Processor at 1.0 GHz

• Intel Coppermine/Celeron Ready Motherboard
• 133MHz FSB and UDMA 100 Support
• 128MB PC133 SDRAM
• 40 GB UDMA-100 Hard Drive
• 56X CD-ROM
• Trident Blaze 3D Shared AGP
• Lucent PCI 56K V.90 Voice Modem
• PCI 3D Waveable Stereo Sound
• 120W PMO Speakers

$639

CS9000

Intel Pentium IV Processor at 1.6 GHz

• New Pentium IV DDR Motherboard
• 400MHz FSB and UDMA-100 Support
• DDR PC1600/2100 and 4X AGP Support
• 128MB PC2100 (266MHz) DDR RAM
• 40 GB UDMA-100 Hard Drive
• 56X CD-ROM
• Nvidia GEFORCE 2 MX400 DVD 3D 64MB
• Lucent PCI 56K V.90 Voice Modem
• PCI 3D Waveable Stereo Sound
• Atlas 44W 2.1 Speakers w/Subwoofer

$899

GS8000

Intel Pentium IV Processor at 1.8 GHz

• New Pentium IV DDR Motherboard
• 400MHz FSB and UDMA-100 Support
• DDR PC1600/2100 and 4X AGP Support
• 256MB PC2100 (266MHz) DDR RAM
• 60 GB UDMA-100 Hard Drive
• 16X DVD-ROM
• Nvidia GEFORCE 2 Ti 3D DVD 64MB DDR
• Lucent PCI 56K V.90 Voice Modem
• SoundBuster PCI 128 4-Channel 3D Waveable
• Creative Labs Inspire 4x 4400 Speakers w/Subwoofer

$1,539

GS9000

Intel Pentium IV Processor at 2.2 GHz

• New Pentium IV DDR Motherboard
• 400MHz FSB and UDMA-100 Support
• DDR PC1600/2100 and 4X AGP Support
• 256MB PC2100 (266MHz) DDR RAM
• 80 GB UDMA-100 Hard Drive
• 16X DVD-ROM
• Nvidia GEFORCE 2 Ti 300 3D DVD 64MB DDR
• Creative Labs Modern Basser PCI Voice Modem
• SoundBuster Audigy 5.1 Sound w/SB1054 Firewire port
• Creative Labs Inspire 5.1 5.1 Speakers w/Subwoofer
• Microsoft Intell Internet Keyboard
• Microsoft Intell Mouse w/Wheel

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Can USB Dial Up Net-Phone Sales?

Customers of Net-telephony companies such as Net2Phone (www.net2phone.com) and Dialpad Communications (www.dialpad.com) have been making calls for years, but so far, most consumers have stuck to their traditional phones.

But that may soon be changing if companies such as London-based Callserve Communications (www.callserve.com) have their way. Callserve’s XpPhone Internet telephone handset plugs directly into a computer’s USB port and automatically configures itself, enabling users to make Internet calls.

Compare that to past Internet calling efforts in which users had to maneuver microphones and make sure sound cards were configured correctly.

One of the biggest draws of USB phones is their ease of use, says Callserve CEO Paul Duffy. “The XpPhone substantially improves the quality and familiarity of making phone calls for our customers,” he says.

But will the ease of use translate into more Internet phone calls? Net-telephony giant Net2Phone is banking that it will; the company is marketing a variety of USB devices, from headsets to headsets, for use with its service.

Forrester Research senior analyst Seema Williams thinks this may not be enough to attract mass adoption. “There might not be any fiddling with sound cards, but plugging anything into the back of your PC tends to cut down on usage,” she says. “Besides, given Windows’ notorious propensity to crash, consumers will be worried that they won’t be able to use the phone if there’s PC trouble.”

—T.H.
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At Gateway, we’re rather familiar with the victory stand. Our cutting-edge computers and incredible service are constantly being recognized with top industry awards. These honors have ranged from Computer Shopper’s “Best Buy” award for our Solo* 3450 notebook (November 2001) to Time Magazine’s “Best of Tech” award for the Gateway 700XL desktop (November 19, 2001) to PC World’s “Best Place to Buy a PC” award for our nationwide chain of Gateway stores (October 2001). Simply put, for quality product, knowledgeable sales staff and value for the money, there’s no beating Gateway.

Pocket Streets for Microsoft® Windows® CE requires Windows® CE 2.0 or later. Hardware available separately. TO AVOID BEING CHARGED A MONTHLY FEE, CANCEL BEFORE ONE-YEAR PERIOD ENDS. One-year period begins 30 days from receipt of system. You may incur surcharges even during promotional period for premium services, or long distance charges on your phone bill, depending on location and calling plan. Communication surcharges may also apply with some access numbers and in AK. For details and access numbers call 1-800-846-2000. Check with your local phone company to determine whether the access number you select is a local call for your calling plan. New U.S. members 18 and older only. Major credit card or checking account required. Use may be limited, especially during peak usage. Prices and configurations subject to change without notice or obligation. Prices exclude shipping and handling and taxes. Not responsible for
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**Gateway 500S**

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- Intel Pentium 4 Processor 1.50GHz
- EV700 17" Monitor (15" viewable)
- 128MB SDRAM
- 20GB Hard Drive
- 32MB NVIDIA™ GeForce2™ MX200
- AGP Graphics
- 16x CD-ROM Drive

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- 16x CD-RW Drive
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- 40GB Hard Drive
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A great notebook doesn't have to be expensive. Affordable yet more than capable, Gateway's Solo 1400 is the smart choice for the busy student or the value-minded professional.

- 14.1" XGA TFT Active Matrix Display
- Mobile Intel Celeron® Processor 800MHz
- 128MB SDRAM
- 10GB Ultra ATA Hard Drive
- Integrated v.90 Modem
- Integrated 24x CD-ROM Drive and Floppy Drive
- Microsoft® Windows® XP Home Edition

*Microsoft® Works Suite 2002
*$999 or as low as $51/mo. (14.9% APR for 48 mos.) (After $100 mail-in rebate)

$1999
Solo 9550

Who needs a desktop when you've got the Solo 9550? It offers ultra-fast processing, serious multimedia capabilities, and an oversized high-resolution display. If speed is what you need, this is your notebook.

- 15" XGA TFT Active Matrix Display
- Mobile Intel Pentium III Processor-1.06GHz
- 256MB SDRAM
- 10GB Ultra ATA Hard Drive
- Integrated v.90 Modem
- Modular 8x DVD-ROM Drive and Floppy Drive
- Microsoft® Windows® XP Home Edition

*Microsoft® Works Suite 2002
*$1999 or as low as $56/mo. (14.9% APR for 48 mos.)

$1499
Solo 5300

A lightweight heavyweight. The Solo 5300 delivers desktop-caliber performance and maximum versatility on the road. Ounce for ounce, it's an unbelievable notebook for the money.

- 14.1" XGA TFT Active Matrix Display
- Mobile Intel Pentium III Processor-1.06GHz
- 256MB SDRAM
- 10GB Ultra ATA Hard Drive
- Integrated v.90 Modem
- Modular 24x CD-ROM Drive
- Microsoft® Windows® XP Home Edition
- Microsoft Works Suite 2002

*$1499 or as low as $42/mo. (14.9% APR for 48 mos.)

$1999
Solo 3450

Thin is definitely in. Case in point, the Gateway Solo 3450. Weighing in at a scant 3 pounds and less than an inch thin, this is the sleekest notebook Gateway has ever made.

- 12.1" XGA TFT Active Matrix Display
- Mobile Intel Pentium III Processor 750MHz
- 192MB SDRAM
- 20GB Ultra ATA Hard Drive
- Integrated v.90 Modem
- Modular CD-ROM Drive and Floppy Drive
- Microsoft® Windows® XP Home Edition

*Microsoft Works Suite 2002
*$1999 or as low as $56/mo. (14.9% APR for 48 mos.)

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The Triple-Play PDA

**Handspring Treo 180**

**What it is:**
Handspring's $399 Treo 180 comes tantalizingly close to the promise of unified messaging. The PDA fuses a full-featured, dual-band mobile phone with a Palm OS-based organizer and an Internet-capable handheld.

**What can it do?**
A lot. The Treo 180 supports Short Message Service (SMS), mobile e-mail, and wireless Web access. It employs a tiny QWERTY keyboard for text input, while for the same price, a 180g model takes its cues from Graffiti text input. Both have a flip-up earpiece. And a $599 version with a color display is slated for release in mid-2002.

**What about Web access?**
Fast and easy, thanks to Handspring's Blazer Web browser, which is optimized to stream Web pages dynamically. Besides faster downloads, the browser enables you to store up to 100 bookmarked sites in 10 different categories.

**Your cell phone's jealous.**
Here's why: One-handed dialing is a snap because the Treo can call numbers directly from its internal phone book, which can stow thousands of contacts. An intuitive interface makes three-way calling, hands-free speakerphone calls, redial, and callback all supremely simple. A side-mounted control lets you easily scroll through messages, phonebook entries, or Web pages.

**It's bulky, right?**
Nope. The Treo is no featherweight, but at the size of a pack of playing cards, it's easily pocketable, and tips the scales at an acceptable 5.4 ounces.

**Dial one up:**
Handspring, www.handspring.com
Double your shooting pleasure with Logitech's latest photographic gizmo. The nifty $79.95 ClickSmart 310 functions both as a pocket-size portable digital camera and a deskbound Webcam. The USB device can store up to 160 still photos (at a resolution of up to 640 by 480 pixels) or 15 seconds of video away from the PC. Plug it into the PC, and its software lets you make yourself seen with video e-mail, video instant messaging, and video monitoring.

Those who find notebook cursor controls frustrating should consider the PocketMouse Pro from Kensington. Designed specifically for laptops, this sleek $39.99 device has several nifty tricks that make it a very roadworthy rodent. Besides its small stature, the PocketMouse Pro is outfitted with three programmable buttons and a scroll wheel. What really sets it apart, however, is its retractable cable: An adjustable-length USB cord extends up to 3 feet and self-winds into the body of the mouse for tangle-free storage. All this and maintenance-free optical technology, too.

Feel realistic force with Saitek's $59.95 Cyborg 3D Force Stick joystick, which delivers up to 10 force-feedback experiences simultaneously. You'll sense action like the recoil from firing a laser cannon, an enemy missile slamming into your rear shields, or a crashing plunge into an asteroid. Equally comfortable for right- or left-handed users, the Cyborg 3D is equipped with a dual right/left-hand throttle, four thumb buttons, four base buttons, and a rapid-response trigger. This stick also comes tricked out with an eight-way point-of-view hat switch, a lever throttle, and a 3D twist for really tight maneuvers.

© Logitech ClickSmart 310
Logitech
www.logitech.com

© Kensington PocketMouse Pro
Kensington Technology Group
www.kensington.com

© Saitek Cyborg 3D Force Stick
Saitek
www.saitekusa.com
Incorporating style, ergonomics, and durability into one notebook bag is a daunting challenge, but design maverick Crumpler has done just that. The company's supersturdy $125 Very Busy Man Laptop Bag is surprisingly roomy, easy to carry, and backed by a 99-year warranty. The bag, available in four colors, is also decked out with features such as heavy-duty rip-stop nylon fabric, big zippers, and seatbelt-type straps. And its "third leg" stabilizing strap makes the Very Busy Man's 14 liters of volume more comfortable to wear for extended periods.

Motorola's new $399 i90c Limited Edition is one business phone that's dressed to thrill. But despite its translucent housing and flashing blue lights, this handset is a serious corporate tool. Employing Nextel's two-way radio service, the device allows you to instantly address other individuals or groups on Nextel's network with a push-to-talk radio capability. Of course, the i90c is also a fully capable digital cell phone that can handle hands-free conference calling, text messaging, downloadable applications, and MIDI ring tones.

Weighing less than an ounce without batteries, Panasonic's $299.95 e-Wear SV-SD80 digital audio player is so small that you'll carry hours of digital music as an afterthought. The tiny e-Wear can be strapped around the neck, arm, or wrist, and includes a 64MB Secure Digital memory card. It employs a stand-alone USB reader/writer to shuttle tunes from your PC to the memory card—this way, you don't squander the player's battery power while transferring files. Also included is a rechargeable NiMH AAA battery, which the company claims will power the SV-SD80 for up to 50 hours on a single charge.

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Editors' Top Five

Computer Shopper and CNET.com editors handpick this month's best desktops, notebooks, monitors, and must-have software.

For up-to-the-minute Top Fives and full reviews, go to top5.cnet.com.

**Leading-Edge Desktops**

<table>
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<tr>
<th>PRODUCT</th>
<th>EDITORS' RATING</th>
<th>PRICE</th>
<th>SPECS</th>
<th>BOTTOM LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS Performance XP 1*</td>
<td>8</td>
<td>$1,789</td>
<td>1.47GHz Athlon XP; 256MB DDR; 60GB hard drive; 19-inch CRT; nVIDIA GeForce3 Ti 500</td>
<td>A great choice for power users on a budget, delivering performance comparable to more expensive systems. Includes a high-performance Plextor CD-RW drive.</td>
</tr>
<tr>
<td>Apple Power Mac G4</td>
<td>8</td>
<td>$2,499</td>
<td>867MHz PowerPC G4; 128MB SDRAM; 60GB hard drive; nVIDIA GeForce2 MX; no monitor</td>
<td>Packs the fastest CPU ever seen in a Mac. Also outfitted with Apple's SuperDrive DVD/CD burner, as well as two IEEE 1394 (FireWire) and two USB ports.</td>
</tr>
<tr>
<td>Falcon Northwest Mach V</td>
<td>8</td>
<td>$3,827</td>
<td>Athlon XP 1800+; 512MB DDR; dual RAID 40GB hard drives; 19-inch CRT; nVIDIA GeForce3 Ti 500</td>
<td>One of the most sophisticated gaming systems we’ve seen. Manufactured with incredible attention to detail and loaded with top-shelf components, including an overclocked CPU and graphics card.</td>
</tr>
<tr>
<td>Gateway 700C*</td>
<td>8</td>
<td>$2,998</td>
<td>2GHz Pentium 4; 256MB RDRAM; 80GB hard drive; 15-inch LCD; ATI Radeon 5000C</td>
<td>Built for speed and comfort, this system has it all, including excellent speakers and a crisp 15-inch LCD. A good solution for gamers or movie buffs who can’t watch DVDs in the living room.</td>
</tr>
<tr>
<td>MicronPC Millennia Max XS*</td>
<td>8</td>
<td>$2,144</td>
<td>2GHz Pentium 4; 256MB RDRAM; 40GB hard drive; 19-inch CRT; nVIDIA GeForce3</td>
<td>A winning combination of price and performance. Ideally suited for demanding home users or small-office workers looking to lighten their daily workload.</td>
</tr>
</tbody>
</table>

**Business Desktops**

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>EDITORS' RATING</th>
<th>PRICE</th>
<th>SPECS</th>
<th>BOTTOM LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Power Mac G4</td>
<td>7</td>
<td>$3,499</td>
<td>Dual 800MHz PowerPC G4 CPUs; 256MB SDRAM; 80GB hard drive; nVIDIA GeForce2 MX; no monitor</td>
<td>The most advanced Mac available, although few applications take advantage of the dual processors. Includes Apple’s SuperDrive CD/DVD burner.</td>
</tr>
<tr>
<td>Dell Dimension 8200</td>
<td>8</td>
<td>$2,376</td>
<td>2GHz Pentium 4; 256MB RDRAM; 80GB hard drive; 19-inch CRT; nVIDIA GeForce3</td>
<td>A well-designed system with an easily accessible chassis and performance in line with other machines in its class. Backed by thorough warranty options, superior electronic documentation, and online assistance.</td>
</tr>
<tr>
<td>HP e-PC 40</td>
<td>7</td>
<td>$949</td>
<td>1.1GHz Celeron; 128MB SDRAM; 40GB hard drive; integrated graphics; no monitor</td>
<td>Designed for quick deployment in corporate environments. Extremely compact, with outstanding security features. Its one drawback: Performance is merely middle of the road.</td>
</tr>
<tr>
<td>HP Vectra VL420*</td>
<td>7</td>
<td>$2,722</td>
<td>2GHz Pentium 4; 256MB SDRAM; 80GB hard drive; 17-inch LCD; nVIDIA GeForce2 MX</td>
<td>Tailored for corporate users, this machine combines an economical but powerful Pentium 4/SDRAM architecture with excellent service and support options and a tool-free case.</td>
</tr>
<tr>
<td>IBM NetVista X41</td>
<td>8</td>
<td>$2,299</td>
<td>1.8GHz Pentium 4; 256MB SDRAM; 40GB hard drive; integrated 17-inch LCD; ATI Rage 128 Ultra</td>
<td>Packaged in a space-saving, all-in-one case with easily accessible ports, this system also includes a bright LCD that produces vibrant colors.</td>
</tr>
</tbody>
</table>
### Mainstream Notebooks

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>EDITORS' RATING</th>
<th>PRICE</th>
</tr>
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<tbody>
<tr>
<td>Dell Inspiron 2500*</td>
<td>7</td>
<td>$1,149</td>
</tr>
<tr>
<td><a href="http://www.dell.com">www.dell.com</a></td>
<td></td>
<td>$149.95</td>
</tr>
<tr>
<td>HP Omnibook 6000</td>
<td>7</td>
<td>$3,068</td>
</tr>
<tr>
<td><a href="http://www.hp.com">www.hp.com</a></td>
<td></td>
<td>$971.90</td>
</tr>
<tr>
<td>Sharp PC-AR50</td>
<td>7</td>
<td>$1,899</td>
</tr>
<tr>
<td><a href="http://www.sharp-usa.com">www.sharp-usa.com</a></td>
<td></td>
<td>$971.90</td>
</tr>
<tr>
<td>Sony VAIO PCG-GR150K</td>
<td>7</td>
<td>$1,599</td>
</tr>
<tr>
<td><a href="http://www.sony.com">www.sony.com</a></td>
<td></td>
<td>$971.90</td>
</tr>
<tr>
<td>Toshiba Portégé 4000</td>
<td>8</td>
<td>$2,429</td>
</tr>
<tr>
<td><a href="http://www.toshiba.com">www.toshiba.com</a></td>
<td></td>
<td>$971.90</td>
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<table>
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<tr>
<th>SPECS</th>
<th>BOTTOM LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>900MHz Celeron; 128MB SDRAM; 10GB hard drive; 14.1-inch TFT; Integrated Intel 815EM graphics</td>
<td>An impressive budget notebook for users not looking for a graphics or gaming powerhouse. Other highlights: long battery life and a generous software bundle.</td>
</tr>
<tr>
<td>900MHz Pentium III; 128MB SDRAM; 20GB hard drive; 14.1-inch TFT; ATi Rage Mobility-M1</td>
<td>Makes up for middling performance with excellent battery life, a travel-friendly design, and a sharp screen, all backed by a three-year warranty.</td>
</tr>
<tr>
<td>750MHz Pentium III; 128MB SDRAM; 20GB hard drive; 14.1-inch TFT; ATi Rage Mobility Radeon-M</td>
<td>Ideal for corporate users, this solid performer is lightweight and loaded with a CD-RW drive, two USB ports, and an IEEE 1394 (FireWire) connector.</td>
</tr>
<tr>
<td>866MHz Pentium III-M; 128MB RAM; 20GB hard drive; 14.1-inch TFT; ATi Rage Mobility Radeon-M</td>
<td>A good, if slightly unorthodox, business notebook, this eye-catching rig offers first-class performance and flexible drive options at a competitive price.</td>
</tr>
<tr>
<td>750MHz Pentium III; 256MB SDRAM; 30GB hard drive; 12.1-inch TFT; Trident CyberBlade XP</td>
<td>Its performance limitations notwithstanding, this system’s 4.5-pound travel weight, built-in 802.11b (Wi-Fi) and Bluetooth support, and three-year warranty make it a great choice for business professionals.</td>
</tr>
</tbody>
</table>

### 17-Inch CRT Monitors

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>EDITORS' RATING</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compaq 720</td>
<td>8</td>
<td>$229</td>
</tr>
<tr>
<td><a href="http://www.compaq.com">www.compaq.com</a></td>
<td></td>
<td>$167.74</td>
</tr>
<tr>
<td>Cornerstone e550</td>
<td>7</td>
<td>$209</td>
</tr>
<tr>
<td><a href="http://www.bigmonitors.com">www.bigmonitors.com</a></td>
<td></td>
<td>$167.74</td>
</tr>
<tr>
<td>Elzo FlexScan F520</td>
<td>8</td>
<td>$307</td>
</tr>
<tr>
<td><a href="http://www.elzo.com">www.elzo.com</a></td>
<td></td>
<td>$167.74</td>
</tr>
<tr>
<td>Samsung SyncMaster 700NF</td>
<td>8</td>
<td>$249</td>
</tr>
<tr>
<td><a href="http://www.samsungmonitor.com">www.samsungmonitor.com</a></td>
<td></td>
<td>$167.74</td>
</tr>
<tr>
<td>Sceptre D770</td>
<td>8</td>
<td>$299</td>
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<tr>
<td><a href="http://www.sceptre.com">www.sceptre.com</a></td>
<td></td>
<td>$167.74</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>SPECS</th>
<th>BOTTOM LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.24mm horizontal dot pitch; 1,280x1,024 top resolution</td>
<td>Low-cost model, targeted primarily at business users. Offers good image quality, distinctive design, excellent color reproduction, and comprehensive documentation.</td>
</tr>
<tr>
<td>0.25mm horizontal dot pitch; 1,280x1,024 top resolution</td>
<td>Provides outstanding performance at all but the highest resolutions, with evenly focused images from edge to edge. Users can further tweak display performance with Cornerstone’s free downloadable software.</td>
</tr>
<tr>
<td>0.23mm horizontal dot pitch; 1,280x1,024 top resolution</td>
<td>Comparable performance to larger, more expensive monitors. Razor-sharp focus and excellent, flicker-free image quality from edge to edge, even at the highest resolution.</td>
</tr>
<tr>
<td>0.25mm dot pitch; 1,600x1,200 top resolution</td>
<td>Excellent choice for performance-minded budget shoppers. Equipped with a Naturally Flat aperture-grille tube and a pop-out panel for display controls. This flat-screen CRT features a 16:1 viewing area and bright, sharp images with no visible flicker. Our only quibbles: the poorly designed onscreen controls and lean documentation.</td>
</tr>
</tbody>
</table>

### Apps for a New PC

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>EDITORS' RATING</th>
<th>PRICE</th>
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<tr>
<td>GoBack 3 Deluxe</td>
<td>9</td>
<td>$49.95</td>
</tr>
<tr>
<td><a href="http://www.goback.com">www.goback.com</a></td>
<td></td>
<td>box+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>download+</td>
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<tr>
<td></td>
<td>$39.95</td>
<td></td>
</tr>
<tr>
<td>Media Jukebox Plus 7.2</td>
<td>2</td>
<td>$24.98</td>
</tr>
<tr>
<td><a href="http://www.musicex.com">www.musicex.com</a></td>
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</tr>
<tr>
<td>Microsoft Money 2002 Deluxe</td>
<td>8</td>
<td>$59.95</td>
</tr>
<tr>
<td><a href="http://www.microsoftoft.com">www.microsoftoft.com</a></td>
<td></td>
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<tr>
<td>Microsoft Office XP Standard</td>
<td>8</td>
<td>$479</td>
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<tr>
<td><a href="http://www.microsoftoft.com">www.microsoftoft.com</a></td>
<td></td>
<td>full</td>
</tr>
<tr>
<td>Norton Internet Security 2002</td>
<td>8</td>
<td>$69.95</td>
</tr>
<tr>
<td><a href="http://www.symantec.com">www.symantec.com</a></td>
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<table>
<thead>
<tr>
<th>REQUIRES</th>
<th>BOTTOM LINE</th>
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</thead>
<tbody>
<tr>
<td>Pentium or faster; 84MB RAM; 10MB hard drive space</td>
<td>Easy and reliable system restoration. Works in background without noticeable performance degradation. A good alternative to Windows Me and XP restore utilities.</td>
</tr>
<tr>
<td>Pentium or faster</td>
<td>This multimedia jukebox encodes music, burns CDs, streams Net radio, and plays most music and video files, including DVDs. Includes an intelligent media organizer, and a scheduler for automatic recording and playback.</td>
</tr>
<tr>
<td>166MHz or faster; 32MB RAM; 65MB hard drive space</td>
<td>Brings order to your personal finances with excellent long-term-planning tools, straightforward setup, and an attractive, Web-savvy interface. A winning financial proposition for everyone.</td>
</tr>
<tr>
<td>133MHz Pentium or faster; 64MB RAM; 210MB hard drive space</td>
<td>Still the best office suite available. A worthwhile upgrade for businesses and group users looking for enhanced collaboration tools and recovery features.</td>
</tr>
<tr>
<td>Requirements vary depending on OS</td>
<td>Marries firewall protection with Norton AntiVirus. Includes LiveUpdate to inoculate your PC against the latest viruses and worms. Easy setup and support for Windows XP are additional pluses.</td>
</tr>
</tbody>
</table>
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- 32MB DDR-4X AGP NVIDIA® GeForce2 Go™ 3D Video
- Sound Blaster Compatible Sound with Wavetable
- 59Whr Li-Ion Battery with ExpressCharge Technology
- MS Windows® XP Home Edition, MS Works Suite
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- 256MB SDRAM at 133MHz
- 300GB Ultra ATA Hard Drive
- Fixed Internal 8X Max DVD-ROM Drive
- 64MB DDR 4X AGP ATI MOBILITY RADEON™ 7500 3D Video
- Sound Blaster Compatible Sound with Wavetable
- 59Whr Li-Ion Battery with ExpressCharge Technology
- MS Windows® XP Home Edition, MS Works Suite
- Internal 56K Fax Modem and 10/100 Fast Ethernet Mini-PCI Combo
- 1-Yr Limited Warranty; 1-Yr Mail-In Service, 1-Yr 24x7 Phone Support
- 6 Months of DellNet by MSN Internet Access®

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E-VALUE Code: 00821-800123m

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- 2" Bay 8X CD-RW Drive, add $179
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Answers to Questionable E-Commerce Practices

Two nonprofit organizations promote reliability to pave the way toward smoother online shopping.

Shopping online has been both a boon and a burden for consumers. Some have benefited from broad selections, jackpot prices, and unbeatable convenience, while others have slammed against obstacles such as vanishing orders, wobbly shopping carts, wildly erroneous billings, and products that limp in DOA.

After more than five years of practice, online vendors should be getting it right all the time and adhering to higher standards. But who’s going to make them? Most consumers who’ve had bad online shopping experiences don’t share their frustration with fellow shoppers.

Now one of the most respected names in unbiased product ratings is collecting information about consumer experiences the old-fashioned way—by telephone. Consumers Union, the nonprofit publisher of the venerable Consumer Reports, has kicked off a program called the Web Credibility Project that will measure integrity in the world of e-commerce, recommending guidelines for best practices to Web merchants and providing research-based ratings to their customers. The company is meticulously gathering consumer attitudes research via scientifically valid phone surveys, rather than Web-based research.

In a few months Consumers Union intends to launch a Web site that will deliver “e-ratings” modeled after those of Consumer Reports. The mission, says Beau Brendler, director of the project, is to grade online merchants on criteria such as transaction fees, shipping rates, and upfront disclosure of information.

Full disclosure is among the most elemental, yet the most critical. “We want Web sites to reveal what sorts of business relationships they have [with the makers of products they sell], to properly label advertisements, and to provide basic information such as physical address, phone numbers, and who owns the site,” Brendler says.

The Council of Better Business Bureaus and the publisher of Consumer Reports are taking steps to make the Web a better place to shop.

“Were a resource for consumers to find companies with a positive track record with the BBB where the company is located, and that have agreed to meet BBB standards,” says Steve Salter, director of BBBOnLine’s reliability program. “One of the more important standards is the commitment to work with the Bureau to resolve disputes with customers.”

Like Consumers Union, the BBBOnLine doesn’t rely only on Web research to make its decisions. “In most cases, we have visited companies in person to make sure that they are where they say they are and that they have inventory in stock,” Salter says.

Even with the proven companies, however, problems can arise. That explains why the organization’s online complaint form averages 1,000 submissions a day, which are dispatched to 127 BBBs in the United States for action, Salter says. You can file a complaint against any company regardless of whether it’s a member of the BBB or the BBBOnLine Reliability program.

Both Salter and Brendler note consumers would prefer to steer their shopping carts clear of problems in the first place, but judging the credibility of a site can be tricky. Here are a few tips:

• Buy only from merchants you trust. If you’re unfamiliar with a site, check out its background at the Better Business Bureau’s site (www.bbb.org), which lists roughly 2 million reports on companies. You can even search for a company by URL.

• Make sure the business lists its physical address and phone number—you’ll want this information should you need to file a complaint with a local BBB. Also carefully consider the company’s return and refund policies, and look for a privacy notice that discloses exactly what the merchant does with your personal data.

• If possible, shop at a site that has earned a solid brick-and-mortar reputation, such as Best Buy or J.C. Penney. Besides the reassurance of a familiar name, you’ll be able to return products at physical stores, if you choose.

These precautions, in tandem with the efforts of organizations such as Consumers Union and BBBOnLine, should pave the way for smoother shopping. And it’s about time. “The industry has matured to the point where the basics are all in place,” Salter says. “The technology is in place, and if a company has survived the dot-com shakeout, it certainly should be able to fill orders.”

Rik Fairlie is editor of Computer Shopper. Contact him at rik.fairlie@cnet.com.
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<table>
<thead>
<tr>
<th>Model</th>
<th>Processor</th>
<th>Memory</th>
<th>Hard Drive</th>
<th>CD/ROM</th>
<th>Modem</th>
<th>Display</th>
</tr>
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<tbody>
<tr>
<td>COMPAQ</td>
<td>Evo D300s MT 1.7GHz</td>
<td>Intel® Pentium® 4</td>
<td>128MB RAM, 20GB</td>
<td>48X CD-ROM, NIC, Windows 2K</td>
<td>$1,109</td>
<td>14.1&quot; Active Matrix Display</td>
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<tr>
<td>COMPAQ</td>
<td>Presario 5320US 1.5GHz</td>
<td>Intel® Pentium® 4</td>
<td>512MB RAM, 40GB, NIC, DVD, 12X CD-RW, 56K, WOP</td>
<td>$999</td>
<td>Monitor and speakers sold separately</td>
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<tr>
<td>IBM</td>
<td>NetVista A22P 1.5GHz</td>
<td>Intel® Pentium® 4</td>
<td>64MB RAM, 20GB, 48X CD-ROM, NIC, Windows 98</td>
<td>$729</td>
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<tr>
<td>SONY</td>
<td>PCV-RX550 1.5GHz</td>
<td>Intel® Pentium® 4</td>
<td>256MB RAM, 606B, DVD/CD-RW, 56K, NIC, Windows XP</td>
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**Notebooks**

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<th>Display</th>
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<tr>
<td>COMPAQ</td>
<td>Evo &quot;N160 1GHz</td>
<td>Intel® Pentium® III</td>
<td>256MB RAM, 2GB, 24X CD</td>
<td>56K, NIC, 14.1&quot; TFT display, Windows XP</td>
<td>only $1,699</td>
<td>#964537</td>
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<tr>
<td>TOSHIBA</td>
<td>Satellite 3000 1GHz</td>
<td>Intel® Pentium® III</td>
<td>256MB RAM, 2GB, DVD/CD-RW, 56K moden</td>
<td>14.1&quot; TFT display, Windows XP</td>
<td>$1,649</td>
<td>#928538</td>
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<tr>
<td>COMPAQ</td>
<td>Presario 1720US 1GHz</td>
<td>Intel® Pentium® III</td>
<td>256MB RAM, 2GB, DVD/CD-RW, 56K, NIC, 14.1&quot; TFT display, Windows XP</td>
<td>only $1,599</td>
<td>#921661 Price after $100 mfr. mail-in rebate. Expires 2/24/02.</td>
<td></td>
</tr>
<tr>
<td>IBM</td>
<td>ThinkPad A30 1.13GHz</td>
<td>Intel® Pentium® III</td>
<td>128MB RAM, 306B, DVD 56K,10/100 NIC, 15&quot; TFT display, Windows 98</td>
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<td>IBM</td>
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**Servers**

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<th>Hard Drive</th>
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<th>NIC</th>
<th>Rackmount</th>
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<tr>
<td>COMPAQ</td>
<td>ProLiant ML330</td>
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<td>D-Link</td>
<td>4-Port 10/100 Cable/DSL Router w/Print server</td>
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**Networking**

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</tbody>
</table>

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There’s a Notebook In Your Future

Why your next PC will be a notebook—or at least why it should be.

Want to know where technology is headed? Just look at online traffic patterns and extrapolate from there. I’m oversimplifying the process, of course. You can’t examine any old Web audience and expect to unearth meaningful results. But digging into the behavior of CNET readers—a group that lives, breathes, and buys tech products by the bucketful—does offer telling clues about trends to watch for.

(CNET Networks is Computer Shopper’s parent company.) Take the never-ending push-pull between desktops and notebooks. According to IDC, desktops outsell notebooks by a margin of 3-to-1. I’m guessing CNET users haven’t read the latest reports. In fact, their buying patterns point to a coming boom in notebook sales, possibly at the expense of the reliable old desktop.

First, though, I should explain where this data comes from. CNET doesn’t sell products. We do, however, count up “leads,” clicks that take a CNET or Shopper.com reader from our site to either a direct manufacturer’s site such as Dell or Gateway, or to a reseller such as CDW or Computers4Sure. Leads are our best indication of what our users are buying. Remember, too, that CNET users are a technologically savvy crew, comfortable with Web research and online purchasing; as you’d expect, they’ve always been more susceptible to the notebook’s siren song than your average computer user. Even so, back in January 2001, online desktop purchases—facilitated by CNET, at least—far outstripped notebook buys. Y2K anxiety had scared plenty of people into buying new, 2000-ready PCs, and pricey notebooks kept others from taking the portable plunge.

Fast-forward just five months to May, and we saw a remarkable turnaround. For the first time ever on CNET, clicks leading to notebook vendors exceeded those to desktop makers. What’s going on here? A deeper dig behind the numbers suggests we’re seeing a fundamental shift in PC-consumption patterns.

For the first time ever on CNET, clicks leading to notebook vendors exceeded those to desktop makers. A deeper dig behind the numbers suggests we’re seeing a fundamental shift in PC-consumption patterns. For years I’ve been hearing from readers that they weren’t quite ready to buy a notebook; the machines were too heavy, the screens too small, the battery too short-lived, and the processors too wimpy. But with the advent of healthy-size screens, reasonable battery life, and potent mobile chips, the notebook suddenly started making sense to many CNET users.

Money played a role in that decision. In a wide-open marketplace like the Web, where pricing is competitive and comparative information is readily available, people will find the sweet spot, the price point at which they can get the most for their money. In January 2001, thousands of notebook purchasers at CNET concluded the sweet spot lay somewhere between $2,000 and $2,500. What kind of notebook did that buy? Probably a desktop replacement such as a 750MHz Sony VAIO, a 500MHz Apple PowerBook G3, or a lightweight Fujitsu LifeBook, which clocked in at 600MHz; all desirable machines, but imperfect ones as well.

By October 2001, the sweet spot had headed way south—the most popular notebooks on CNET were going for $1,000 to $1,250. The efficient online market had decreed the bargain notebook suddenly made sense. Yes, these machines, laptops such as the 900MHz Celeron-based Dell Inspiron and the 3-pound 500MHz Apple iBook, weren’t perfect, but compromise is easy to accept when you’re paying $1,000; at $2,500, those same concessions are hard to swallow. Where the January 2001 bargain notebooks, with their cramped screens, serious heft, and modest processors, didn’t cut it, their end-of-2001 counterparts did. Just like that, a switch had been flicked, and online shoppers wasted no time responding.

Here’s another reason to bet on the notebook: Desktop upgrades have become largely irrelevant. Time was, you had to move up to a new PC every two years just to run the latest software or try the newest techno-toys. Today, unless you’re a digital-video documentarian, a rabid gamer, or just can’t live without Windows XP (unlike, I know), you can easily squeeze a few more years out of old faithful. Hard drives are big enough, bandwidth is plentiful, and even older processors can suffice for most activities. If you’re going to buy a machine, you’ll more likely go for something that will expand your horizons, whether that means spreadsheeting over a latte in the local Starbucks, surfing the Web wirelessly from your deck, or commuting to school or work with a sexy new device tucked firmly under your arm. In other words, you’ll get a notebook.

Steve Fox (steve.fox@cnet.com) is editorial director of CNET.com. For more tech trends, read his weekly “Buzz Meter” column at buzz.cnet.com.
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Software as Service? Not on Your Machine

Companies such as Microsoft are trying to convince us we’re better off renting software than buying it. Don’t believe them.

The idea of charging for software on a per-use basis or as a rental or lease item is a throwback to a model that was largely vanquished by the evolution of the IBM PC and Microsoft. Why is it suddenly reappearing as a “good idea” from companies such as Microsoft?

What makes it so appealing to a large company like Microsoft is that the numbers and profit margins are incredible, even to a company banking $1 billion per month from the sale of its products. But exactly whom will this retro scheme attract? In the short term, IT managers who like such old-fashioned notions. In the long term, nobody.

The software-as-service model is the software equivalent of the dumb terminal or network computer, an idea whose time passed 20 years ago. Microsoft was once the biggest booster of the concept of the decentralized, personal computer. The only reason the company has switched gears is because it would rather massively increase sales than resign itself to becoming a stable, steady-growth, IBM-like company. It may be Microsoft’s undoing.

Embracing the Enemy

Until recently, Microsoft considered the software-as-service model an enemy modern notions would obliterate. Now the company has decided to use it as a methodology for growth. This has led to various crackpot schemes, such as .Net, while it test-markets various software-rental strategies around the world.

Would a business pay $5 per day per seat to use Office XP? Microsoft wants to know. The product sells for around $500. At, say, $4 for a 24-hour license, would it be cheaper to rent it? If you use it every day, the answer is no. If you use it a few times a month, the answer is yes. Microsoft’s ostensible long-term goal is to charge on an “as used” basis. The bottom-line goal is to make more money by renting the software instead of selling it.

This isn’t going to work for the same reason Sony can’t sell downloadable music for $2.50 for a single album cut. Despite the fact that there’s virtually zero manufacturing and distribution costs, the record companies can’t bring themselves to sell their wares for less than before. In fact, they’d like to charge even more, based on the mistaken notion that they’re adding value by letting customers download music. This mentality began with the early days of online banking, when the user who was doing most of the accounting work for the bank was actually charged more for the privilege. This craziness eventually crept into ATM machines, which often charge users even though they save banks money.

The notion of passing savings on to the user is lost on banks, record companies, and other profiteers. Microsoft is no different. The only reason to develop a software-as-service model is to increase profits, not to benefit the customer. Although some may argue the customer somehow comes out ahead, the goal is to get customers to give you more money, not less.

The main reason such schemes fail is today’s computer user isn’t an idiot who can’t add two and two. The only beneficiaries of the pay-per-use model are someone who can’t afford to own anything and has to ramp up fast and cheap, and someone in an emergency situation—you’re in Timbuktu and your computer dies, and you absolutely must have access to Word and a rented computer.

The real downside of the software-as-service model is it’s most likely to be undercut by competition. Although Microsoft is a monopoly in the OS business and a virtual monopoly in the office-suite business, upstarts in the office-suite business, such as Software602, which offers a credible office suite for free, can still kill it.

The Office Underground

Microsoft also has to compete with itself. Once someone buys Office 2000 or Office XP, what’s the point of licensing anything for a day? In fact, since the release of Office 97, Microsoft has made few improvements to office suites that warrant serious spending. It’s nice to keep up and have the latest versions, but you don’t need them. They’re trivial upgrades. A bootleg underground of old versions of Office is likely to emerge if Microsoft were to go to the software-rental model and discontinue the shrink-wraped product.

The only way a rental or service model can emerge at this late juncture is if some mysterious have-to-have-it-to-survive software program arrived on the scene and was immediately established as a rent-only system. And I wonder how long even that would last before it was cloned and sold as a shrink-wraped program.

Software as a service exists at the high end of computing, with products such as SAP and various database systems used by large corporations. Lotus Notes falls into this category, too. But it’s hard to imagine any personal-productivity or mass-market program being sold effectively this way.

John C. Dvorak hosts TechTV’s Silicon Spin and is currently working on two books. Reach him at shopper@dvorak.org.
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The NetVista X41 is a one-piece “all-in-one” design, with the CPU portion wrapping around and behind the display’s pedestal. The drive bay sits on a pivoting platform hidden just below the lower bezel of the panel. Press a button, and the drive drops down for access; a gentle tuck upward, and it latches out of sight. In previous versions of the NetVista we’ve looked at, the bay platform contained both floppy and DVD drives. Here, only a combo DVD-ROM/CD-RW drive is present, and the floppy drive is an external USB device. With the growing popularity of CD-RW drives, it seems only a matter of time before the lowly floppy drive goes the way of the dodo—not only in NetVistas, but in PCs in general.

IBM’s design team deserves praise for positioning the ports correctly. Many of the all-in-one systems we’ve seen require torturous hand contortions to get connectors into tiny recessed cubbyholes situated in all the wrong places, often hidden by plastic panels. The NetVista sports ports both at the back of the CPU portion of the device and at the top rear of the display, all within easy reach. Around the back, you’ll also find a removable hatch for two low-profile PCI expansion slots. Though low-profile cards can be hard to find, IBM offers modem and IEEE 1394 (FireWire) upgrades. The system lacks any other device-expansion opportunities, apart from its six USB ports. If you opt for the IEEE 1394 upgrade, that and the six USB ports should provide enough expansion flexibility for almost any scenario.

Once you’ve absorbed the design nuances and sit in front of the screen, you’ll notice that the 17-inch LCD excels in both graphics and video. It produces vibrant colors, and the screen brightness during DVD playback—often a problem for LCDs—wasn’t lacking. In fact, we had to reduce it a bit. You can make the adjustments from either the front-mounted controls or from within the Mediamatics DVD player. The two speakers integrated into the panel’s bezel won’t shake your office windows with volume, but the audio quality makes up for it.

IBM computers are known for their conservative performance, and the NetVista is no exception. Though based on a peppy 1.8GHz Pentium 4, it’s saddled with SDRAM and an integrated, last-generation graphics system. That’s a recipe for mediocre performance compared with decked-out DRAM systems. Pitted against rivals with a similar memory type but cutting-edge graphics cards, the X41 lagged behind in our Office Productivity suite, with its score falling about 10 percent below those of the competition. And three words about the NetVista’s 3D performance will suffice: Don’t go there. Many corporations would give their PC users the same advice, which is why 3D (and thus gaming) performance is neglected in the NetVista.

IBM offers 24/7 toll-free customer support and backs the NetVista X series with a one-year onsite warranty. Considering the level of integration in the system, you might want to think of it more as a notebook and consider one of IBM’s three-year onsite-warranty upgrades; a top-notch three-year pact with four-hour onsite response during business hours costs $239.

We won’t try to convince you that the NetVista X series is anything less than a corporate prize—it is. But underneath the slick sheen lies a competent meat-and-potatoes computer more than capable of tackling typical office tasks, and an LCD that’s very easy on the eyes. Besides, you probably deserve it.

—Bill O’Brien

SECTION CONTINUES ON PAGE 64
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### ProStar 8593

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- 16MB Video Memory
- Removable 3.5" 1.44MB FDD exchangeable with opt. Iomega Zip Drive, or 2nd FDD
- 3D Surround Sound with Hardware Wavetable
- 2 Built-In Stereo Speakers and 1 Built-In Microphone
- Built-In Touchpad Pointing Device
- 2 Type II or 1 Type III PCMCIA Slots
- 10/100 Ethernet Lan Adapter
- 56K Capable V90 Modem
- 3.3V Smart Lithium-Ion Battery
- Infra Red, Wireless Fast IR Interface
- 1 IEEE 1394 Port & 1 Video-In Port
- 2 USB Ports & 1 TV-Out Port
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- Jocks: 1 Line-In, 1 Line-Out and 1 Microphone
- Microsoft® Windows® XP home edition
- Carrying Case and AC Adapter

**Specifications**
- Intel® Pentium® III Processor 1.0GHz
- 128MB 133MHz SDRAM expandable to 512MB
- 10.0GB Hard Drive
- BX® Max. DVD-ROM Drive (CD-RW opt.)

**Price** $1345

### ProStar 2273

**Common Features**
- 512KB On-Die L2 Cache
- Integrated Ultra AGP Graphics (4x AGP Performance) with 64MB Max. User Definable Shared Memory Architecture
- 3.5" 1.44MB FDD
- 3D Surround Sound
- 2 Built-In Stereo Speakers and 1 Built-In Microphone
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- 10/100 Ethernet Lan Adapter
- 56K Capable V90 Modem
- Infra Red, Wireless Fast IR Interface
- 3 Hot Keys for E-Mail, Browser and API
- 1 IEEE 1394 Port
- 2 USB Ports & 1 TV-Out Port
- Other Ports: 1P, Ext. Keyboard and Ext. CRT
- Jocks: 1 Headphone and 1 Microphone
- Microsoft® Windows® XP home edition
- Carrying Case and AC Adapter
- Slim Notebook: 12.7" w x 10.9" d x 1.48"

**Specifications**
- 13.3" XGA Active Matrix Display
- Intel® Pentium® III Processor 1.13GHz
- 256MB 133MHz SDRAM expandable to 512MB
- 20.0GB Hard Drive
- BX® Max. DVD-ROM Drive (CD-RW opt.)

**Price** $1345

### ProStar 2273

**Common Features**
- 13.3" XGA Active Matrix Display
- Intel® Celeron® Processor 1.0GHz
- 128MB 133MHz SDRAM expandable to 512MB
- 10.0GB Hard Drive
- BX® Max. DVD-ROM Drive (BX® Max. DVD opt.)

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4283

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- 3.5" 1.44MB FDD
- 3D Surround Sound (SPDIF 5.1 output for DVD)
- 2 Built-in Stereo Speakers and 1 Built-in Microphone
- Built-in Touchpad Pointing Device with Scrolling Keys
- 2 Type II or Type III PCMCIA Slots
- 56K Capable V.90 Modems and 10/100 Ethernet
- 10/100 Ethernet Lan Adapter
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- 56K Capable V.90 Modem + 10/100 Ethernet
- 3 Hot Keys for E-Mail, Browser and DVD Player
- Shels for 1 4x5" Standard Memory Stick and 1 Panasonic SD Memory Stick
- 2 Snap-on color Palm Rest Covers
- High Performance Smart Lithium-Ion Battery
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- Other Ports: 1T, Ext. Keyboard and Ext. CRT
- Microsoft® Windows® XP home edition
- Carrying Case and AC Adapter
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2293

Common features
- 256MB On-Die L2 Cache
- Integrated Ultra AGP Graphics (4x AGP Performance) with 444MB Max. Star Defendable Share Memory Architecture
- 3.5" 1.44MB FDD
- 3D Surround Sound
- 2 Built-In Stereo Speakers and 1 Built-In Microphone
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- 56K Capable V.90 Modem + 10/100 Ethernet
- 3 Hot Keys for E-Mail, Browser and API
- 2 USB Ports
- Other Ports: 1T, Ext. Keyboard and Ext. CRT
- Jacks: 1 Headphone and 1 Microphone
- Microsoft® Windows® XP home edition
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5190

Common features
- 256MB On-Die L2 Cache
- Integrated Ultra AGP Graphics (4x AGP Performance) with 64MB Max. Star Defendable Share Memory Architecture
- 3.5" 1.44MB FDD
- 3D Sound Effect
- 2 Built-In Stereo Speakers and 1 Built-In Microphone
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- 10/100 Ethernet Lan Adapter
- 56K Capable V.90 Modem
- Infra Red, Wireless Fast IR Interface
- 1 USB Port
- Other Ports: 1T, Ext. Keyboard and Ext. CRT
- Jacks: 1 Headphone and 1 Microphone
- Microsoft® Windows® XP home edition
- Carrying Case and AC Adapter
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YOU EXPECT TO HEAR KEYS JINGLING WHEN YOU BUY A NEW CAR, not a new PC. But you hear that unmistakable sound when you unpack Hewlett-Packard's e-PC 40. Designed for quick and easy deployment in big corporations, the $1,204 e-PC 40 comes with several security-minded features, including a key lock to prevent unauthorized access.

Not much larger than a dictionary, the e-PC 40 can sit horizontally or vertically, and fits easily into the most cramped cubicles. Inside, Intel's fastest-yet Celeron revs the machine to 1.1GHz, but other components work against this promising clock speed. For starters, HP put a spacious (40GB) but slow (5,400rpm) hard drive in the system and uses Intel's integrated 815E graphics engine instead of a graphics card. The installed 128MB of RAM is sufficient for running Windows XP, but 256MB would have been preferable.

In our tests, the e-PC 40 experienced bottlenecks in all the critical throughput areas: disk, graphics, and memory subsystems. Once you've adjusted for operating-system differences—Windows 2000 generally delivers better application scores than Windows XP—the HP's application performance is relatively slow. Compared with the Gateway 300X, the HP lags by about 7 percent overall on applications. Even so, keep in mind that most new PCs provide more than adequate performance for ordinary business apps, and the e-PC 40 certainly delivers enough room for office programs and Web surfing. If you run CAD or computer-animation programs, however, you'll want a different PC.

Performance notwithstanding, the real weak link is the HP P720 17-inch CRT monitor that came as an extra-cost option with our test system. The screen is flat, doing a commendable job of reducing glare, and the onscreen menu system offers easy tweaking of image settings. But text looks quite fuzzy, though not because of the monitor's common 0.25mm dot pitch. (In general, smaller is always better with this spec.) We wouldn't be comfortable staring at this screen for any length of time. Neither the monitor nor the e-PC 40 itself has built-in speakers, so any software requiring audio will also require a separate purchase of speakers.

The system does have smart design and a low price in its favor. Design pluses include a plastic Port Control System that can be used in tandem with the key lock to deny access to the rear ports. Speaking of ports, one might expect such a diminutive system to lack old-style ports, but the e-PC 40 has both parallel and serial connectors, in addition to four USB ports. Two of the USB ports are conveniently located at the front of the case (and secured by software in the BIOS). In place of a modem, the system has an Intel 10/100mbps Ethernet port.

IT staffers will appreciate how easy it is to access the e-PC 40's vital components. A single thumbscrew unlocks a side panel, which reveals a pair of SIMM sockets (one unused), the power supply, and the hard drive. It's refreshingly easy to remove the hard drive, thanks to an ingenious lever-lock system. An adroit tech could add more RAM and swap in a new drive in a couple of minutes.

In addition to Windows 2000 Professional (you can opt for Windows XP as well), HP supplies useful manager-level diagnostic and troubleshooting utilities. The only documentation, however, is a skinny quick-start guide; other manuals must be downloaded from HP's Web site. The company's support site is extremely well-organized and thorough, however. It provides FAQs, manuals, drivers—even a matrix of peripherals that have been tested for compatibility.

HP's one-year system warranty includes onsite service and 24/7 phone support, but the phone call is not toll-free. Extended warranties are a mix-and-match combo of up to five years and four turnaround-time options (the best being 24/7, four-hour onsite service). Overall, support on the e-PC 40 ranks above average for a business system, though the brief standard warranty and toll-call telephone support come up short.

If you're on the lookout for an affordable, highly compact system that's easy to deploy and manage, the HP e-PC 40 can't be beat. But if you also need fast performance for applications more demanding than standard office-suite apps, you might do better elsewhere. And businesses planning widespread deployment of the e-PC should consider a different monitor; HP's P720 17-inch tube has more fuzz than a Backstreet Boy.

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<td>AMD Athlon™ 1 GHz Processor</td>
<td>AMD Athlon™ 1.2 GHz Processor</td>
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<td>20GB IDE Hard Drive 128 MB Memory</td>
<td>40GB IDE Hard Drive 128 MB Memory Built-in 120GB Backup</td>
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Leading technology made affordable
Intel Pentium III processor 1266MHz
Dual processor capable
512KB advanced transfer L2 cache
128MB memory std./4GB max
No hard drive std./max optional storage of 293GB
3.5" floppy disk drive + CD-ROM
Integrated 10/100 Ethernet and Ultra160 SCSI
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**POLYWELL POLY 880XP-1800**

FAST BUT FINICKY SYSTEM, THE $2,550-DIRECT POLYWELL POLY 880XP-1800, which features the new 1.53GHz Athlon XP 1800+ processor, needs some fine-tuning before it ventures out into the world.

After days of testing, the trademark silver tower of the Poly 880XP-1800 tarnished before our eyes. Though packed with quality components and all the latest technologies, the system had a few more rough edges than we can generally tolerate in a new PC—or than we would expect from Polywell, based on other PCs we've seen from the company.

We have no complaints about the system's overall performance on our benchmark tests. The 1.53GHz Athlon XP 1800+ CPU, combined with 256MB of DDR SDRAM, a 64MB WinFast GeForce3 card, and a RAID array of two 7,200rpm 40GB drives, delivers blazingly fast application and game results. The Poly 880XP-1800 is quite competitive with 1.8GHz Pentium 4 RDRAM-based systems, with which AMD's marketing department seeks mind-share parity. Only the Internet Content Creation scores lag, but AMD says this is because Windows Media Encoder needs a patch to recognize that Athlon XP chips now support the Pentium 4's SSE2 instruction set. (We were unable to test this claim by press time.) The Polywell did score dead even with another system we tested, the ABS Performance XP that's based on the same 1.53GHz Athlon chip.

When it came to harnessing all this power, however, we ran into problems. First, DVD video continually fell out of sync with the audio, despite the use of a first-class Toshiba SD-M1502 drive. We ran CD Copy in Media Player, encoding a disc at 128kbps to WMA format from both the DVD-ROM and the BTC BGE16101M CD-RW drive. We observed that it took almost twice as long (7 minutes per megabyte) to encode from the DVD drive as it did from the CD-RW drive (4 minutes per megabyte). Worse, between buffer underflows and hang-ups in NTI CD-Maker 2000 Plus, the CD-RW drive produced only coasters. Polywell suggested that the Windows XP drivers might not have been ready for prime time, but we compared them to those in a similarly configured system and found no indication that anything was amiss.

It's a shame, too, because the system comes equipped with a Creative Labs Sound Blaster Audigy Platinum card and Cambridge SoundWorks DTT2200 Desktop Theater 5.1 speakers for the full home-theater experience. (We did have to play a bit with the settings to get the surround effect to work properly, though.) And the DVD video—as well as humdrum office apps—looked good on the 17-inch LCD that accompanied the PC. The monitor's 1,280-by-1,024 resolution, however, may be a bit hard on the eyes for some, unless you select the large text and icons options from the Display Properties dialog. Other than the small icons and text produced by the native resolution, the display produced the eminently readable image you'd expect from an LCD panel.

The silver case is ready for expansion. You need no tools to gain access to the interior; once inside, a whopping seven drive bays are waiting to be filled, along with two PCI slots and two RAM sockets. This system supports a maximum 1.5GB of DDR SDRAM. The case also has four USB ports. The Poly 880XP-1800 comes ready to communicate, too, with both 56kbps modem and 10/100mbps Ethernet cards preinstalled.

Polywell backs the Poly 880XP-1800 with lifetime in-house telephone support (available during office hours), along with one year of 24/7 third-party telephone support. The warranty is longer than most, with five years of labor coverage and three years on parts. One to five years of onsite service is available at extra cost.

The setup snafus we encountered make this Polywell experience one best left to experienced users. Even the keyboard is bound to give you grief. The particular Logitech Internet Keyboard that comes with the system supplies lots of custom buttons for Web surfing; unfortunately, Polywell did not supply the software necessary to use these buttons, and Logitech's Web site states that the company has no plans to offer software support for this keyboard under Windows XP. All in all, we can't help but feel that the whole of the Polywell Poly 880XP-1800 is less than the sum of its parts.

—Lori Grunin
New iMac Lacks That Special Something

WHEN APPLE COMPUTER INTRODUCED THE IMAC THREE YEARS ago, it heralded a stronger product line that has since produced the Power Mac G4 tower, the PowerBook G4 Titanium, the latest iBook, and Mac OS X. But while Apple’s other products have changed significantly—and all for the better—the iMac itself remains fundamentally the same. Despite the new iMac Special Edition’s various improvements in features and performance, it’s a tough sell compared with a low-cost PC.

The new iMac line comes in four configurations, ranging in price from $799 to $1,499. Like the iBook line, the iMacs differ only by G3-processor speed, hard drive size, the included optical drive, and the standard amount of RAM. They all come with two IEEE 1394 (FireWire) and two USB ports, 10/100mbps Ethernet, and a V90 modem. All four models ship with a CD-RW drive and at least 128MB of RAM, except for the $799 low-end model, which ships with a CD-ROM drive and only 64MB. The $799 system’s minimal memory configuration is indefensible when Mac OS X, which ships installed on the hard drive, requires a minimum of 128MB to run. Unless you’re part of the education market, for which OS 9 is likely the best choice, you’ll want to opt for one of the other iMac configurations, all of which have 128MB of RAM or more.

We tested the $1,499 700MHz model, which ships with a 60GB hard drive and 256MB of RAM. It felt snappy and responsive, as any 700MHz G3 should, but only under OS 9.2. Our benchmarking tests don’t yet run under OS X, but we also tested the iMac Special Edition informally using the installed OS X 10.0.4. The system felt sluggish and unresponsive, but OS X seems to do this to all Macs. Apple claims to have addressed this and many other issues in the now-shipping 10.1 upgrade.

Under 9.2, the iMac took 12 minutes and 42 seconds to complete our PhotoShop tests, almost 2 full minutes faster than the 600MHz model it replaces. The speed boost is most likely due to the newer model’s 256MB of RAM versus the 64MB in the older model.

Unfortunately for those on the Apple side of the Mac/PC debate, the 700MHz iMac was about the same gap slower than our 800MHz Pentium III-based Dell Dimension reference system. Considering that the Dell system plus a monitor costs at least $500 less than the iMac we tested, the 700MHz iMac seems overpriced for what you get. The $999 500MHz or $1,299 600MHz models offer a better balance of performance and price.

The iMac’s integrated 15-inch CRT monitor is adequate for basic computing, but most PCs these days sell with at least a 17-inch CRT or a 15-inch LCD, both of which have a wider viewing area. While it’s possible to plug an external VGA monitor into the iMac, there’s no point in doing so; if you need a bigger monitor, you might as well purchase a Power Mac G4 and a separate display.

Apple’s standard service-and-support package for the iMac is the same as for all its products. You get a standard one-year warranty on parts and labor. Toll-free technical support is available around the clock, but it’s free only for the first 90 days of ownership; if you want more than that, you’ll have to pay for an extended support package. Apple’s Web site does offer lots of information via an extensive, searchable knowledge base, and its user-friendly documentation should get you off on the right foot.

The iMac was innovative two or three years ago; now it’s only a good but outdated system. Cash-strapped Mac devotees may still get plenty of use out of one (keeping in mind that the two current middle iMac configurations are the best deals), but if you can afford the Special Edition unit we tested, we’d recommend moving up to the low-end 733MHz Power Mac G4 tower. With that machine and an inexpensive monitor, you have a faster, more expandable system with a much better graphics card. In the future, we hope Apple revamps the iMac in the same successful manner as it has its PowerBook G4 and iBook lines.

—Barry Lubov
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- Intel® Celeron®/Pentium® (P-ii 800/800MHz available)
- Intel® 613 Chipset
- 512K Static RAM Built-in
- 16/100 Network Built-in
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- 2x CD-ROM / Floppy Drive (optional DVD or CD-RW ROM)
- MS Windows XP ME or ME
- 1-Year Limited Warranty

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### HOME PC

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MATROX MILLENNIUM G550
Talking Heads, Two Displays, One Upgrade

MATROX GRAPHICS MAKES IT CLEAR THAT THE audience for its new dual-monitor Millennium G550 graphics card is business and home-office users—not gamers. You won’t see anything close to acceptable 3D performance with this $125 graphics card, but you will find Matrox’s new HeadCasting engine for face-to-face voice chats, Matrox’s DualHead technology for multimonitor setups, and strong 2D performance.

The G550’s DualHead technology supports simultaneous output to two displays, including any combination of a CRT or LCD (analog or digital) with a television, CRT, or LCD. The card also incorporates Matrox’s newest innovation, the HeadCasting engine. HeadCasting allows you to project a Max Headroom-like version of your face and head over a LAN or the Internet, which another G550 user can see in the same resolution or a non-G550 user can view in a lower resolution. Included software animates the lips of your face when you speak into a microphone. There’s no question that the HeadCasting feature is cool, but it’s hard to believe that business users will accept it as an appropriate means of business communication.

Moreover, despite the card’s business focus, we can’t ignore the G550’s poor 3D benchmark scores. The Quake III Arena test, at a resolution of 1,024 by 768 with 32-bit color, resulted in a figure of 12 frames per second—less than 25 percent as fast as nVidia GeForce2 cards we’ve tested. The card’s 2D performance was very good, but it was still less than that of GeForce2 cards.

Does the Matrox G550 offer enough usefulness to overcome its performance deficiencies? For many users, the answer is yes. Being able to use two displays is a great advantage, and the HeadCasting feature is an innovative tool for online face-to-face communication. If you’re a serious gamer or your company already has videoconferencing facilities, the G550 will hold little appeal. But anyone in the market for an inexpensive graphics card with substantial features should take a close look.

—Neil Rondall

CORNERSTONE F1200
A Solid and Slick Flat-Panel Value

CORNERSTONE PERIPHERALS TECHNOLOGY IS NEW to the LCD market, but it has put out a worthy contender in its new $799 F1200 17.4-inch LCD. For starters, it’s as solidly built as a bomb shelter.

Rugged design is only the start of the F1200’s appeal. This LCD has dual VGA inputs, plus a built-in USB hub with four rear-mounted USB ports. Three front-mounted buttons control the onscreen display, which provides a full range of settings. The panel’s swivel base allows lateral movements, and a support beam allows a generous range of vertical adjustments.

The F1200 has a wide 160-degree viewing angle (both horizontal and vertical), a 400-to-1 contrast ratio for crisp, bright images, and a 25ms pixel-response rate. We easily adjusted the brightness for a wide range of ambient light settings without compromising image quality. The screen was uniformly backlit with exceptional sharpness from edge to edge.

For all its good points, the F1200 hovered around the average mark in our DisplayMate benchmark testing. Image quality was superb, and text was clear and well-defined at various point sizes, nearly approaching the clarity of more expensive digitally connected LCD monitors. Colors were rich and well-saturated when displaying photos. The fast pixel-response rate made viewing high-bit-rate DVD movies a pleasure; images were rock-steady, even during busy scenes. But the F1200 failed to score higher on our tests because of “streaking” problems, resulting in ghosting in high-contrast areas.

Besides offering a record-setting five-year warranty (three years for the backlight), the company has a zero-dead-pixels policy, promising to replace any F1200 with one or more dead pixels. (A dead pixel is one that’s frozen in the on or off position.) In addition, tech-support calls are toll-free, around the clock, for the life of the monitor. One minor note: Although the manual looks substantial, all but 13 of the pages are in languages other than English.

The Cornerstone F1200 offers a good overall package, with sturdy construction, useful features, and service and support that protects you for the long haul.

—David English
hp pavilion pc with AMD Athlon™ XP processor

Sample Configuration:
• AMD Athlon™ XP processor 1900+ with QuantiSpeed™ architecture*
• QuantiSpeed™ architecture outperforms competitive 1.9GHz PC processors
• 512 MB memory
• 60GB hard drive
• 16x DVD
• 12x8x32 CD Writer Plus CD-RW Drive
• Windows® XP
• Up to 12 months AOL

The AMD Athlon™ XP Processor features QuantiSpeed™ architecture, boosting overall productivity and enabling tremendous performance while working in multiple applications. Experience AMD Athlon™ XP processor—Extreme Performance for Windows® XP.

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* QuantiSpeed™ architecture operates at 1.6GHz
**Hardware**

**TDK 16/10/40 VELOCD REWRITER**

**Speed to Burn For a Cool Price**

TDK ELECTRONICS' AFFORDABLE 16/10/40 VELOCD ReWriter is not only fast, it features BURN-Proof technology for preventing buffer underruns. Best of all, this speedy internal IDE drive sells for a very reasonable $99.

In our tests, the VeloCD ReWriter distinguished itself when pitted against other 16x drives. The drive burned a 500MB test folder to CD-R in 4 minutes and 41 seconds, and took 3 minutes and 32 seconds to install Microsoft Office Small Business, both about average times. But it burned a 43-minute audio image to CD-R in 3 minutes and 29 seconds, wrote 400MB to a CD-RW disc in 6 minutes and 29 seconds, and extracted a 26-minute audio track in just under a minute, all excellent showings.

The VeloCD comes bundled with Ahead Software's well-regarded Nero Burning ROM 5 mastering software and InCD packet-writing software. Nero isn't as easy to learn as other programs that ship with CD burners, such as Roxio's Easy CD Creator, NTI's CD-Maker, or Prassi's PrimoCD, but it offers full support for disc-image files and has a built-in audio editor. TDK also bundles its own Digital MixMaster software that lets you rip audio files, encode them, and burn them to CD, plus Adobe's ActiveShare for organizing and sharing your digital images. Musicmatch Jukebox is also included, but it largely duplicates the abilities of Digital MixMaster.

TDK's installation guide and VHS videotape offer plenty of help for the first-time installer, and the drive comes with all the necessary hardware—IDE and audio cables, plus mounting screws. TDK provides a typical (but briefer than we'd like) one-year warranty on the VeloCD; you get toll-free phone support for the life of the product, available during business hours Monday through Saturday.

Today, 16x/10x/40x drives are the sweet spot of the CD-RW market because of their ideal balance of price and performance. The TDK 16/10/40 VeloCD ReWriter is the sweetest of them all.

—Jon L. Jacobi

**CASIO QV-4000**

**This Savvy Shooter Could Be Sharper**

INTENDED FOR SERIOUS AMATEUR PHOTOGRAPHERS and demanding business users, Casio's $699.99-direct QV-4000 is packed with advanced features, and offers good handling and intelligent design. Unfortunately, this 4.1-megapixel camera's appeal is marred by subpar image quality.

The QV-4000's styling is handsome, and the camera is more compact than many of its rivals. Weighing slightly more than a pound with batteries and memory card, it has a solid feel and a well-constructed metal body. Its user interface and design are among the best in the digital-camera world; with most of the important functions controlled by clearly labeled buttons and dials. Our only design gripe was the On/Off/Review dial, which was hard to turn.

Casio's designers included a smorgasbord of color, contrast, and sharpness settings. All that's lacking is a high ISO-equivalent setting for shooting in low light without flash.

The QV-4000's extensive feature set is supported by good, if not outstanding, performance. The camera starts up in a middling 5 seconds or so, and the shot-to-shot time is also average—about 3 seconds. The 3x Canon zoom lens has a smooth, precise zooming action and above-average macro ability, focusing as close as 2.4 inches. The built-in flash's maximum range of 11.5 feet is also above average.

Despite its good performance and feature set, the QV-4000 doesn't produce top-notch images. The problem is an overall lack of sharpness. In our tests, we've seen several 3.3-megapixel cameras produce images with more usable detail, less noise, and fewer visible artifacts around edge transitions. On the other hand, our exposures were quite good, and the camera yielded reasonably accurate colors and good skin tones. The QV-4000 can generate nice, if not especially impressive, images for up to 8 by 10-inch prints.

All told, the Casio QV-4000 is a versatile, well-designed high-end camera at an attractive price. But if you need top-notch image quality, focus on Canon's 4-megapixel PowerShot G2 instead.

—Eamon Hickey
**HP PHOTO SCANNER 1000**

**Scan Your Snaps While Saving on Space**

At just $99 DIRECT, HEWLETT-PACKARD’S PINT-SIZE Photo Scanner 1000 costs less than most full-featured flatbed scanners. The scanner’s simple design makes scanning, organizing, and sharing photos effortless. The lean design does have a downside, however: Don’t expect control over settings such as image size and resolution, or color depth and exposure. Even so, the Photo Scanner 1000 may work for you if all you want is to scan photographs for printing, e-mail, or Web posting.

The 9.5-by-6.5-by-1.5-inch scanner weighs only a pound. It includes its own USB cable and draws power from the USB connection. The small manual describes the installation in full, and the software CD makes setup all but automatic.

The Photo Scanner 1000 has a 4-by-6-inch scan bed with a fixed resolution of 300dpi. Press the button on the side of the case, and the bundled ACDSee software launches, showing you a thumbnail of the scanned photo. You can then e-mail, print, or edit the picture. Preformatted layouts are included, helping you to print everything from wallet-size to 8-by-10-inch prints.

The scanned images looked good for a scanner in this price range. Colors were accurate, and no posterizing was obvious on continuous-tone areas. The unit’s low resolution did result in a noticeable loss of detail, and response in shadow and highlight areas could have been better, but the overall quality was adequate.

HP’s support for the Photo Scanner 1000 is much less satisfactory. The company backs the scanner with a mere 90-day warranty, and phone support is neither available around the clock nor toll-free. Worse, after 90 days, you have to call a 900 number at $2.50 a minute for support. Still, for simple snapshot scanning, the HP Photo Scanner 1000 is an inexpensive solution.

—Alfred Berger

**ONKYO SE-U55 USB DIGITAL AUDIO PROCESSOR**

**Audiophile Sound From Your PC**

Despite their current widespread use as music sources, home computers were not originally designed with good audio quality as a top priority. Analog signals pick up digital noise from the sound card and other interior PC components. The $249 Onkyo SE-U55 USB Digital Audio Processor, a stand-alone unit that connects to an exterior PC USB port, solves these problems by processing incoming and outgoing digital and analog audio at high quality.

The SE-U55 places audio ports where you can access them easily. It has the computer connections that every music fan needs: stereo inputs and outputs for analog line signals, and coaxial and optical digital connectors on the back. Microphone and headphone jacks are on the front of the unit, both with level controls. Signal flow to and from your PC is digital; 1-bit digital-to-analog and analog-to-digital converters handle the transformation between the two audio formats. The fact that the switch takes place outside the computer results in an incredibly clean 100dB signal-to-noise ratio.

The SE-U55 comes with two pieces of software. One, Rhythmic Circle Fuse, swirls multiple-layer visualizations, and is PC- and Mac-compatible. The other is the PC-only CarryOn Music, a combination jukebox, format converter (among MP3, WAV, and WMA), and audio-CD burner.

USB audio can be somewhat problematic in certain instances, due to demands on system resources. Tested on a 400MHz Pentium II machine with some background programs (ZoneAlarm, for instance) running, the SE-U55 worked well. Audio dropouts became evident, however, when we simultaneously used a word processor, Web browser, and other programs. The skips are a problem with USB audio in general, not just with the Onkyo unit. If you have a 400MHz or faster machine with 128MB of RAM or more, and don’t run lots of programs at the same time, you shouldn’t encounter any problems. If your PC fits those qualifications and you long for improved sound from your computer, the Onkyo SE-U55 could be worth the $249 price.

—Ivan Berger
NIXVUE DIGITAL ALBUM

Tote 20 Gigs of Your Digital Pics

NIXVUE SYSTEMS HAS TAKEN AIM AT PROLIFIC mobile photographers with its compact Digital Album file-storage device. Distributed by Jobo in the United States and Canada, it's available in both 10GB ($499) and 20GB ($599) capacities.

At 9.9 ounces, the cassette-player-size unit fits right in with the rest of your photo gear. When you're at home or in the office, it berths in its charging dock. The simple design makes downloading images from a memory card easy. Two navigation buttons and an OK button on the front of the unit give you access to five main menu items on the status LCD—Copy, Verify, Video On/Off, Power Off, and Disk Space.

Transferring image files from a memory card to the Digital Album is fast, averaging about 1MB per second. The device can accept any memory card for which a PC Card adapter is made. After you transfer your images, you can view them thumbnail-size or full-screen on any NTSC or PAL television with a video-in jack.

When you connect the Digital Album to a computer, it shows up as an external drive, allowing you to drag and drop your images where you please. An internal battery supplies power; it lasts about 2.5 hours per charge, yielding at least 30 transfers totaling 1GB or more before needing a recharge.

Our biggest complaint is that the Digital Album has no built-in LCD for viewing images. We didn't encounter any image-transfer problems, but the only way to be sure an image has been transferred uncorrupted is to look at it. Also, the device's documentation is lean.

The Digital Album is a step in the right direction, but a good used laptop will perform the same functions and more at less cost. But if your storage device's size and weight are important to you—and cost is a secondary issue—this versatile device will perform very well indeed.

—Arthur H. Bleich

ACTIONTEC WIRELESS-READY MULTIMEDIA HOME GATEWAY

Strikingly Simple Broadband Sharing

FOR LESS THAN YOU'D SPEND ON AN EXPENSIVE dinner, Actiontec Electronics' new $134.99-direct Wireless-Ready Multimedia Home Gateway lets you share Internet access, peripherals, and files across PCs in your home. Add a pair of Actiontec Wireless PC Cards ($104.99 each), and you can wirelessly surf the Web as well. It's a good starter solution for home networkers on a budget.

Installation is simple. Actiontec's illustrated setup guide walks you through the process. After installation, you handle further maintenance and management via your Web browser. The Web-based management interface makes configuration easy. The wizard asks you a few simple questions, then automatically configures your system.

On the back of the small (2-by-8-by-7-inch) unit, you'll find four 10/100mbps Ethernet ports for wired connections. The gateway's dual PC Card slots, located on the side of the unit, are unique. The top slot supports 802.11b (Wi-Fi) networking, which lets you wirelessly communicate via radio waves with other devices at speeds up to 11mbps within a 330-foot range; the bottom slot adds support for other networking flavors, including HomePNA, HomePlug, and Bluetooth. Both slots also support the new 802.11a technology, with throughput speeds of 54mbps.

The limitations of the built-in firewall represent this gateway's biggest deficiency. The gateway currently neither offers a hacker-pattern-inspection and blocking feature to protect against threats such as IP spoofing, nor does it send e-mail alerts of attacks. Security-conscious users will want to add a separate firewall.

Actiontec backs the gateway with a one-year limited warranty, which is short considering 3Com's five-year warranty for its Home Wireless Gateway. Telephone support is neither toll-free nor available around the clock, but you can find a lot of answers yourself on the Actiontec Web site.

Actiontec's Wireless-Ready Multimedia Home Gateway is a smart way to share a broadband connection in your home. It's definitely the low-cost leader in this category, and it's easy to set up and configure.

—Rich Schwarcz

EDITORS' RATING

RATED 7.0 OF 10

PROS

- Inexpensive; easy to use, four wired Ethernet ports
- Rudimentary firewall protection; short warranty

CONS

- Expensive; skimpy documentation

MFR. EST. PRICE: $599 (10GB), $599 (20GB)

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DIRECT PRICE: $134.99

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Whether you want high-end desktop power or a well-designed notebook, with MicronPC your investment is backed by the unsurpassed service and support that won a Reader's Choice Award from PC Magazine (August 2001).

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- 10/100 Integrated Network Interface
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- Microsoft® Windows® XP Professional
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- 1.44MB 3.5-inch Floppy Drive
- 8x Var. Speed DVD Drive
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- 10/100 Integrated Network Interface
- USB Mouse
- Primary Battery
- Microsoft® Windows® XP Professional
- Microsoft® Office XP Small Business Edition
- Norton AntiVirus 2002
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DELL INSPIRON 4100
Swift, Solid Performance Outclasses Staid Design

As the first system we’ve seen equipped with the 1.2GHz mobile Pentium III-M processor—built on a 0.13-micron manufacturing process, which allows 512K of full-speed, on-chip Level 2 cache—the $2,361 Dell Inspiron 4100 is predictably fast. This 6.3-pound, two-spindle unit also offers a no-nonsense portable package with plenty of oomph and solid components. But if you seek a fashionable portable with luxury design elements, you might want to look elsewhere.

To supplement its bleeding-edge CPU, our evaluation model came with Windows 2000, as well as 256MB of RAM and an ATI Mobility Radeon graphics subsystem with 16MB of video RAM. The result: The Inspiron delivered heavy-duty performance right and left, turning in a blistering score of 124 on the SYSmark 2001 test suite. Only one notebook has scored higher on all the SYSmark tests: the IBM ThinkPad T23. Though based on the slower 1.13GHz version of the CPU, the T23 benefits from a fast 5,400rpm hard drive; in contrast, the Inspiron 4100’s 20GB hard drive spins at only 4,200rpm. By the time you read this, Windows XP will be standard in this notebook; you can expect equal, if not better, performance with XP installed.

The Inspiron 4100 also excels at most video and graphics tasks. DVD playback from the system’s swappable DVD-ROM/CD-RW combo drive looks excellent at full screen, with little pixelation and no apparent stuttering. Gamers will also like the notebook’s high 3D frame rates. Our test unit scored an impressive 53 frames per second in Quake III Arena. That’s fast, though nowhere near the 100-plus frame rate that nVidia’s top-of-the-line GeForce2 Go graphics chip can produce. And based on our battery testing, you’ll be able to play games for more than 3 hours, which is about average for this class of notebook.

In addition to its processing brawn, the Inspiron 4100 boasts a high-resolution, 14.1-inch screen, which supports a native 1,600-by-1,200-pixel resolution at 32-bit color. CAD and graphics pros, as well as mobile presenters, may find this pinpoint resolution helpful, but many consumers will reach for their magnifying glasses or simply set the OS to 120dpi for bigger fonts and icons, a choice possible in Windows’ Display Properties. If you simply must have a 15-inch display, you’ll have to move up to Dell’s three-spindle Inspiron 8100 series; the 4100 series tops out at 14.1 inches.

With respect to aesthetics and connectivity, the system delivers mixed results. Its standard matte-black case appears unimpressed, and the snap-in color attachments for wrist rest and screen lid look outdated. The Inspiron also includes dummy PC Cards, rather than spring-mounted doors, to protect the empty PC Card slots. Although our evaluation model came with built-in Wi-Fi networking, it offered neither an IEEE 1394 (FireWire) port nor a second USB connector. These are the telltale signs of an aging design. Audio response was good, but only one of the system’s stereo speakers seemed to be working in our evaluation unit.

We love the Inspiron’s keyboard, which has been the standard for the past several generations of this line. It strikes the perfect balance between resistance and key travel for a feel reminiscent of a standard desktop keyboard. Key layout is perfect, with full-size Tab and Backspace keys and well-situated arrow buttons, along with the Ctrl key at bottom left, as it is on desktop keyboards. This placement is ideal for the Ctrl key combination shortcuts many users prefer for Microsoft Office commands. The Inspiron’s dual pointing devices are also a nice touch. Unfortunately, the notebook lacks dedicated audio-CD controls or one-touch Web buttons, save for a single programmable key that defaults to the excellent Dell Solution Center.

Speaking of support, Dell preloads a good assortment of documentation and help files on the Inspiron’s hard drive, and includes a full version of Microsoft Office XP Small Business. Though Windows 2000 or XP Professional comes standard on this portable, you can choose Windows XP Home Edition for $60 less. Oddly, Dell backs this Inspiron with a short one-year parts-and-labor warranty. Onsite service costs $219 for three years. This coverage seems a bit anemic to us, but at least phone support is toll-free and available anytime.

The Dell Inspiron 4100 is a blazingly fast, solid, two-spindle notebook that will attract itinerant businesspeople of all stripes. Eye candy it’s not, however—in many ways, the 4100-series design is showing its age.

—Asa Somers
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WinBook

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SONY VAIO PCG-SR33K

Ultraportable Basics For a Price That’s Light

T he SONY VAIO PCG-SR33K is as light on your wallet as it is on your shoulder. Frequent travelers will find the insubstantial load of this 2.9-pound notebook a welcome alternative to muscle-straining 8-pound desktop replacements. And at just over $1,000, the PCG-SR33K comes in at about half the price of many competing subnotebooks.

As you’d expect from a subnotebook, the PCG-SR33K demands several compromises to achieve its feathery weight. The small screen, cramped keyboard, and rather slow processor are predictable. Only the hard drive is internal; the bundled 16x-maximum CD-ROM drive connects to the notebook’s PC Card slot, and the optional floppy drive attaches to the USB port.

The PCG-SR33K’s 600MHz Mobile Celeron processor offers plenty of performance for typical office applications, but it’s relatively slow for multimedia and content-creation work. Despite this, Sony has equipped the notebook with an IEEE 1394 (i.Link/FireWire) port, and bundled a variety of video-capture and -editing applications. These Sony-branded apps, including MovieShaker and Smart Capture, are fast enough for patient users to edit home videos, but we certainly wouldn’t recommend this notebook as your primary video-production rig. Also, the 10GB hard drive is rather cramped for movie editing. Sony does offer a PCG-SR27 model with a 750MHz Pentium III and a larger 30GB hard drive, but its $1,999 cost is almost double that of the PCG-SR33K.

The 10.4-inch screen is surprisingly readable. Because it has only an 800-by-600 resolution, text and icons remain large enough to remain distinct, but the low resolution feels cramped when editing video and still images, and you’ll find yourself scrolling horizontally to view some Web sites. The S3 Savage1X video chip is no speed demon: 2D-graphics performance is reasonable, but the abyssal 3D speed will have you bringing along a Game Boy Advance for portable entertainment.

Battery life is excellent for an ultraportable, at 3 hours and 35 minutes. You can extend run time even further with Sony’s double-capacity lithium-ion battery, but it costs a whopping $499.99—nearly half the price of the notebook. In fact, many of Sony’s add-ons for the unit are disturbingly pricey; doubling the built-in 128MB with Sony’s 128MB MicroDIMM memory module will also set you back $499.99. (No need to spring for that, though—Crucial Technology offers a third-party alternative for just $90.)

On a keyboard about 3 inches narrower than a typical notebook’s, touch-typing takes a bit of practice. But even with our fat fingers, we were able to adjust easily. The layout’s satisfactory, but you’ll have to use the Fn key to access page-movement functions. Alternatively, you can use the side-mounted Jog Dial for scrolling.

The PCG-SR33K isn’t brimming with expansion options. Along with the IEEE 1394 port, it includes a slot for a Memory Stick card, which simplifies file transfer for owners of Sony cameras, MP3 players, or CLIÉ PDAs. It also has an internal 56kbps modem, a single Type II PC Card slot, and a USB port. That’s it—no parallel or serial connectors, not even an IR port. Given the increasing ubiquity of USB and IEEE 1394 components, the absence of legacy ports could be overlooked, but the notebook lacks a network port, a glaring omission for broadband Internet access. Because the external CD-ROM drive uses the PC Card slot, you could be in for an unpleasant amount of card swapping if you opt for a PC Card network adapter. A USB hub sounds like a must-have add-on for your home base. Consider headphones, too: The tinny built-in speakers strain to produce anything more elaborate than a beep.

The software bundle is particularly good for an inexpensive notebook. Along with a suite of Sony video- and image-editing apps and utilities, you’ll also find Quicken 2001, Norton AntiVirus 2001, and Microsoft Word 2002. Sony’s warranty policy requires you to register the notebook to get a year of coverage. Otherwise, your notebook is covered for just 90 days.

Although we’d be happier if it had built-in networking—or at least a second PC Card slot—the Sony VAIO PCG-SR33K strikes a good balance between size and functionality. It’s an excellent lightweight companion if you don’t need desktop-level power on the road.

—Denny Atkin
Best Buy

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<td>4MB nVIDIA GeForce-2 Ti 110 AGP Graphics 16X IDE DVD-ROM Drive, 3.5 Floppy Drive 24x10x40 CD-RW Internal IDE Drive 56K PCI Data Fax Modem v.92 Creative Labs SB AUDIGY PCI Digital Deluxe ATX Tower Case Creative Inspire 51.5 3.00 sound system 17” 26 N.I. Digital Monitor</td>
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TOSHIBA SATELLITE 3000-S353
Orbit the Earth With A Well-Rounded Satellite

TOSHIBA AMERICA’S $1,499 SATELLITE 3000-S353 OFFERS AN UNUSUAL combination of slim size, speedy performance, and a surprisingly low price. Its thin, stylish gray-and-silver case and midrange price belie the Satellite’s desktop replacement capabilities.

The 900MHz Pentium III helps keep the price down and provides performance almost indiscernible in everyday use from the slightly faster (and $200 more expensive) gigahertz-class chip. The notebook uses a single SODIMM for its 128MB of RAM, leaving a second slot open for extra memory—always appreciated. The 20GB hard drive isn’t the fastest we’ve seen, but it stores more data than you’d want to lose in an airport terminal.

As you’d expect from a system equipped with a GeForce2 Go chipset mated to a large, bright, crisp 14.1-inch active-matrix display, the system is quite game-worthy. Although it includes only 16MB of graphics memory versus 32MB in competitors, the Satellite still manages a smooth 86.7 frames per second in Quake III Arena. Business-graphics performance also significantly outpaces 1GHz systems based on slower graphics chips. For on-the-road entertainment, you’ll find stutter-free, sharp DVD playback with audio volume and clarity that are unusual in a thin notebook.

At 3 hours and 13 minutes, the battery supplies enough juice to watch a movie and get some work done as well. After watching the underrated hour-and-a-half Mallrats DVD, the Satellite’s battery meter showed 40 percent remaining.

Of course, compromise is inevitable when creating a lightweight notebook, and here it’s most evident in the keyboard. Though it provides decent tactile feedback, key travel is very shallow. The layout is somewhat unusual as well, with the Insert and Delete keys at the bottom of the keyboard and the Windows key in the top right corner. The two programmable function keys are tiny and the same color as the plastic around them, making them hard to see. More useful are the audio-playback and volume controls. They are accessible even with the cover closed, and you can listen to music CDs with the notebook powered off—a thoughtful touch that lets the business traveler relax in a hotel room without the Windows desktop beckoning for attention. An AccuPoint II pointing stick with two scroll buttons provides navigation.

The lightweight two-spindle design means the notebook has only one drive bay (the other “spindle” is the hard drive); the floppy and 8x DVD drives are hot-swappable. Other Satellite 3000 models offer options for the bay such as a DVD-ROM/CD-RW combo drive.

Although IEEE 1394 (FireWire) ports aren’t just for high-end notebooks anymore: This Satellite has one, readying it for digital video, external IEEE 1394 hard drives, or other peripherals. The Satellite also features internal modem and network connectors, plus parallel, VGA, S-Video, and infrared ports, and three USB ports. (Remember when one USB port was considered cutting edge?) The Satellite lacks a serial port, so owners of older PDAs will need to use a serial-to-USB adapter or an infrared connection. The manual alludes to an internal Mini-PCI 802.11b (Wi-Fi) card, and the unit even ships with drivers installed for it, but at press time the company wasn’t offering this option. Count on Toshiba to remedy this situation in short order, however.

Although the desktop comes littered with icons, the software bundle is disappointing: a 90-day subscription to McAfee.com ActiveShield, the limited Quicken 2001 New User Edition, RingCentral fax software, and a number of utilities. You won’t find a bundled office suite, but Toshiba offers Lotus SmartSuite 2001 for “free” with an $8.95 shipping charge. At least Software 602’s (www.software602.com) excellent suite of Microsoft Office-compatible apps can be downloaded for free without the shipping charge.

Toshiba backs the Satellite with a one-year, return-to-depot, parts-and-labor warranty, including battery coverage and 24/7 toll-free telephone support. Extended warranties are available at extra cost.

The Toshiba Satellite 3000-S353 offers performance, battery life, and portability you don’t typically find in a notebook for such a low price. Compromise does rear its head, though, in the mediocre keyboard and poor software bundle. We’d like to see Toshiba offer more configuration options, but out of the box this model has the hardware to satisfy gamers, students, and business travelers alike.

—Denny Atkin
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COMPAQ IPAQ H3850
An SD-Powered Pocket Rocket

COMPAQ COMPUTER'S IPAQ LINE, KNOWN FOR its sexy and powerful handhelds, was once the mightiest among the Pocket PC pack. Despite its competition, Compaq retains the old look and 206MHz StrongARM processor in the iPaq H3850. It features new hardware power with a Secure Digital (SD) card slot, a 65,000-color reflective LCD, and 64MB of RAM, along with the Pocket PC 2002 operating system and new voice-control software. Impressive specs, yes, but for an equally imposing direct price of $599.

The most noticeable cosmetic change is the addition of the SD memory-card slot at the top of the unit, which is also where the built-in speaker is now housed. (It was previously located underneath the directional pad at the bottom.) An upcoming model, the H3870, will include a Bluetooth transceiver.

The H3850 has the advantage of being compatible with existing iPaq sleeves, allowing users to add CompactFlash memory cards and PC Card modems, among other accessories. The sleeves are a bit bulky, however. The H3850 ships with a screen-cover sleeve, a welcome improvement over the black slipcover that comes with other iPaqs.

Compaq has managed to increase the capacity of the battery without increasing its dimensions. Instead of 8 hours of battery life per charge, the company says you should now be able to get up to 10 hours. Also, gamers will be glad to know that the buttons below the screen can now recognize two simultaneous button presses. This is important when playing games that require you to move and fire at the same time. For the business-minded, Compaq has bundled Voice Command and Control, which lets you dictate commands to your Calendar, Contacts, and Inbox.

Clearly, the addition of the SD card slot and the more colorful screen make this iPaq a compelling PDA. But with Toshiba and Casio offering their own alluring Pocket PC models, the winner in this round is less clear than it was a year and a half ago.

—Darren Gladstone

SAMSUNG SPH-1300
The Palm/Phone Union Now Stands Stronger

N AME THE BEST SMART PHONE ON THE U.S. MARKET, and you'll be naming Samsung's SPH-1300 for Sprint's PCS service. Similar to the Kyocera Smartphone QCP 6035, which also runs the Palm operating system, the $499 SPH-1300 is more compact, has a color screen, and ships with a second battery.

At 6 ounces, the SPH-1300, which measures 4.9 inches by 2.3 inches by 0.8 inch, is smaller and lighter than the 7.3-ounce QCP 6035. You can carry the Samsung phone comfortably in a pants pocket, but we found the optional $15 belt-clip case a better solution.

The SPH-1300's 256-color screen is not as sharp as those of the color Sony CLIE handhelds, but the display is bright and easy to read. The phone is also comfortable to hold, and you navigate the menus by touching the screen or using up/down keys. You won't find an actual dial pad, only a virtual one that works well. You can automatically dial phone numbers by tapping an onscreen button, and you can program 20 voice-activated phone entries. The built-in speakerphone is another plus.

All the standard phone features are here, including vibrate mode, multiple ring tones, and call history. Sprint's WAP browser is preinstalled, and the wireless Web has never looked so good or been as easy to use. (The phone displays up to 12 lines of text.) Because the maximum connection speed is 14.4kmps, browsing is slow, however.

Samsung claims up to 4 hours of continuous talk time and 100 hours of standby time from the included lithium-ion battery. We felt a little short of the standby rating, but we hit the talk time.

At $499, the SPH-1300 is priced fairly for what you get. Our misgivings are that the phone doesn't offer USB connectivity, has no slot for adding memory, and isn't compatible with Sprint's upcoming 3G network. (It will continue to work on Sprint's existing 2G network.) Drawbacks aside, the Samsung SPH-1300 is a strong-sounding, well-designed smart phone that currently stands a notch above the rest of the hybrids on the market.

—David Carnay
# Extreme Performance for Windows XP Pro

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<th>Googlegear Home</th>
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<td>• With QuantiSpeed™ Architecture¹</td>
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¹ QuantiSpeed™ Architecture outperforms competitive 2.0GHz processors

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Handy Digicams For Your Handheld

For quick pics on the road, these two add-on modules give your organizer the ability to take visual notes.

The legions of HandSpring Visor and Palm M500 Series owners can now add digital snapshotting to their PDAs’ repertoires. Two new camera modules from HandSpring and Eastman Kodak leverage the power of (and your investment in) these popular handhelds to let you take quick digital pics, store them in the device, and transfer them easily to your desktop.

Make no mistake: These plug-in cameras are not professional-strength shooters. Neither includes a flash, so you’ll be limited to taking snaps of well-lit subjects. Image quality in both cases is only serviceable, and both use the handheld’s screen as the viewfinder. But if you don’t want to tote a bulky digicam, and quality isn’t a prime concern, you may be pleasantly satisfied with one of these handy visual notetakers.

Handspring Eyemodule2

Designed by Ideo, the Handspring Eyemodule2 is a second-generation digital-camera module for Visor handhelds. It isn’t perfect, but its user-friendly interface and decent image quality left us muttering, “That’s not bad.” And when it comes to this type of camera, that’s actually high praise.

The $199 module is compact, weighing 1 ounce and protruding only an inch from the top of your Visor once it’s connected. When you slide the Eyemodule2 into the Springboard slot of your Visor (we tested the camera with a Visor Prism), the camera application is automatically installed on your handheld, and you’re ready to start shooting, though you’ll have to manually install a second application on your PC or Mac to transfer photos. After that, simply select the photos you want to transfer, and they’ll be uploaded during your next HotSync.

The camera has a fixed-focus lens (18 inches to infinity). You only have to make sure your subject is well-lit, and choose whether you want your resolution set at Palm size (160 by 120 pixels) or full size (640 by 480). The camera’s 6MB of free memory allows you to store around 50 full-size color pictures (in JPEG format) or 150 color Palm-size pictures. You can also shoot in black-and-white mode, which allows you to store many more images.

To frame and take a picture, you use your Visor’s screen as the viewfinder. The module itself has a shutter button, which makes snapping pictures easy. It would be a stretch to say that the Eyemodule2 shines in the image-quality department, but the pictures we took compared favorably with those taken with a midrange Webcam.

All in all, though we’d like to see the Eyemodule2 cost closer to $150, its acceptable image quality and extra features make it a solid business tool.

Eastman Kodak has been making camera attachments for Palm devices for the last several years, and now the company offers one for Palm’s latest line of slim handhelds. The $129.95 PalmPix Camera for the m500 Handheld Series features higher resolution than previous models and no-battery operation. The 1.9-ounce unit is also exceedingly light and folds up to fit in a shirt or pants pocket.

When you’re ready to shoot, simply unfold the PalmPix and clip it onto the back of your Palm. (You’ll need to add software before you use it.) Then choose among 320-by-240 (one-quarter-VGA), 640-by-480 (VGA), and 800-by-600 (SVGA) resolutions. At the highest resolution, you can store about 15 pictures in the Palm m505’s 8MB of internal memory. If you have a memory card inserted, you can move pictures to it from your Palm’s memory. You also have a choice of predefined focal positions: Portrait, Landscape, Macro, Business Card, and Page (the last for taking pictures of letter- or A4-size paper).

To snap a photo, you click the Date Book button on the Palm and use the Palm’s screen as your viewfinder. When you’re done framing, click the button again to take the picture. Even though the camera offers 800-by-600 resolution, don’t expect very sharp images. Still, the PalmPix did a solid job of capturing business cards and could be useful for snapping quick visual reminders.

Although the PalmPix is a clear improvement over previous versions, we can’t recommend using it as your primary digital camera if picture quality is important to you.

—David Carnoy

Editors’ Rating

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<td>ADDRESS</td>
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MICROSOFT PLUS FOR WINDOWS XP

A Plus Pack With A Lot of Minuses

With every new version of Windows, Microsoft offers Plus as an aftermarket collection of add-ons. Plus used to offer engaging entertainment (remember the pinball game in Plus 95?) or useful utilities (such as VirusScan in Plus 98), but Plus for XP provides only lightweight multimedia add-ons.

The Plus accessories come in four flavors: themes, screensavers, games, and digital audio. The first and second feature desktop decorations, the third a way to kill time when XP’s bundled games get old, and the fourth a selection of Windows Media Player add-ons. Many of the same tools—or better—can be found at a lower cost as shareware.

The desktop themes—collections of icons, wallpaper, sounds, and mouse pointers—are snappy, but you’re limited to back-to-nature, outer-space, and Leonardo da Vinci stylings. We were hoping to land themes that would recast XP’s interface to look like Mac OS X or BeOS.

The screensavers are slick, particularly Aquarium, a photo-realistic virtual fish tank. Although these themes and screensavers look spectacular, they’re not unique. You can get the Aquarium screensaver by downloading the free SereneScreen Aquarium (www.serenescreen.com), which also works on Windows 95, 98, Me, 2000, and NT.

The trio of Plus games—Russian Square, The Labyrinth, and HyperBowl—may look better than the games bundled with XP, but all rank high on the Bore-O-Meter. The Labyrinth can be downloaded for $9.99 from RealArcade Central (www.realarcade.com).

The digital-audio offerings—MP3 Audio Converter, CD Label Maker, and Personal DJ—offer some value. Converter translates MP3 audio files to Windows Media Audio format to save disk space, and CD Label Maker prints labels and jewel-case inserts for CDs. Personal DJ lets you build playlists. But all three should have come with Windows Media Player in the first place.

Our bottom line: Forget Microsoft Plus for Windows XP. Take your $40 and spend it on something XP really needs: an antivirus program.

—Gregg Keizer

ZONEALARM 2.6

Free Firewall Stops the Snoops

Always-on broadband connections make Web browsing and downloading faster than ever, but that open connection to the Internet makes it much easier for outsiders to access your computer. Zone Labs’ ZoneAlarm 2.6 is a firewall—free for personal use, though you’ll encounter a “nag” screen on startup—that protects your PC from unauthorized intrusion.

To get started with ZoneAlarm, download the 2.8MB file. The self-extracting file installs in less than a minute. Accept the default configuration values, and you’ll find the ZoneAlarm icon conveniently sitting in the system tray. The program installs with high Internet security settings, so you get maximum protection right away.

The heart of ZoneAlarm is its main screen, which is also its control panel. Its straightforward five-button layout lets you set configuration options such as low, medium, or high security; select which programs can and cannot access the Internet; lock or unlock the connection; and review ZoneAlarm alerts. A padlock icon shows the status of your Internet connection and allows you to quickly lock the system so that no activity is allowed if you need to step away. When trouble strikes, simply click the panic button from within the control panel to shut down Net access immediately. In our tests, ZoneAlarm successfully closed and hid all the ports on our test computer.

Even though ZoneAlarm is free to individuals, Zone Labs maintains a support Web site that includes a comprehensive FAQ and an online form. A Zone Labs technician answers your questions within three to four business days.

ZoneAlarm 2.6 offers proven firewall protection. Not only will hackers be unable to access your PC, they won’t even know you’re online. Best of all, it’s so easy and thorough that it rivals expensive packages such as Norton Internet Security.

—Stephen Bigelow

EDITORS’ RATING 4.0  RATED 1 TO 10

Pros: Cool fish-tank screensaver
Cons: Shiny content for the price; many identical features are Web downloads

Direct Price: $39.95

Requires: 500MHz Pentium or faster (750MHz recommended); 64MB RAM (128MB recommended); 300MB hard drive space; Windows XP Home Edition or Professional

Microsoft

800-426-9400

www.microsoft.com/

Windows/Plus

Editor’s Price:

$35.50

For real-time pricing, go to shopper.com and enter number.

EDITORS’ RATING 9.0  RATED 1 TO 10

Pros: Free; thorough protection against outside attacks; easy to set up
Cons: Nag screen at startup

Direct Price: Free

Requires: Windows 95, 98, 2000, Me, XP, or NT

Zone Labs

877-546-3823

www.zone labs.com
An Update for the McAfee Faithful

Keeping your computer safe from nasties—worms and viruses—is vitally important. One of the least expensive ways to protect your data is to install Network Associates’ $39.99 McAfee VirusScan 6.0.

Although this update costs $10 more than its predecessor, the extra cash also buys you a basic personal firewall. The McAfee firewall is good, but it doesn’t offer anything you can’t get from free programs such as ZoneAlarm or Tiny Personal Firewall.

VirusScan is much improved, shielding your computer against all kinds of intruders, including viruses, worms, and Trojan horses, as well as ActiveX controls and Java applets. VirusScan should steal an idea from Norton AntiVirus, though, and simply repair infected files without your intervention.

Version 6 contains a number of new antivirus weapons. It monitors Microsoft Outlook—the Typhoid Mary of computer-virus carriers—for suspicious behavior, then warns you when, for instance, an e-mail message is about to be sent to more than 40 recipients. VirusScan also protects your PC against viruses or worms that might sneak onto your desktop from your handheld during synchronization.

VirusScan is a breeze to use, thanks to its top-to-bottom interface redesign that features a browser-like look. But VirusScan isn’t perfect. Scheduling scans involves tackling a complex dialog box, rather than stepping through a simple wizard. At least VirusScan’s automatic virus-definition updater matches Norton’s, and an annual update subscription costs half as much (only $4.95 after the first year).

How well does it work? Our tests showed that VirusScan identified viruses in ZIP files before they hit the hard drive, something Norton can’t do. But VirusScan continues to prove deficient at catching viruses that exist but have not yet spread.

At $39.99, McAfee VirusScan 6.0 is a bargain for a complete antivirus package with firewall. However, its so-so performance with in-the-wild viruses knocks it off our must-get list for everyone except current users.

—G.K.

Still the Top of The Desktop Crop

In the desktop-publishing arena, QuarkXPress is top banana. It offers precise control over typesetting and color handling, and makes it easy to lay out any sort of manuscript.

We looked at a beta version of QuarkXPress 5.0. (Pricing for 5.0 had not been determined at press time; the previous release, 4.1, sells for $869 direct.) The new version is the same desktop publisher professional designers know and love. The document-layout process hasn’t changed: Create boxes to hold text and graphics, then import these elements as needed. The palettes and toolbar are much the same, too. Unfortunately, Quark still provides no way to customize the program’s design environment.

The 5.0 version includes a handy new table-creation tool—simply specify the number of rows and columns you want. The tool also makes it easy to convert text to tables, add rows and columns, and combine cells into larger entities.

We’re also pleased that the program finally provides ample tools for creating Web pages. But it makes you select the format you intend to publish in (standard, XML, or Web document) before you start your project. This doubles—or triples—your work if you intend to use the same file for multiple purposes. The additional Web features are impressive, though, letting you build true WYSIWYG Web pages without HTML coding.

The program still lacks a multiple-undo function—no matter how many edits you make to a project, you can only undo the last. And it’s ridiculous that Quark doesn’t offer a built-in PDF engine; you have to purchase Adobe Acrobat Distiller to export a file to PDF.

Quark’s Web site includes downloads, user forums, and a form to contact technical service, but the phone-support policy is miserly. After one free call, you’ll pay $35 per incident or $149 for a year’s support.

Nonetheless, QuarkXPress is still the cream of the desktop-publishing crop. If you’re already a QuarkXPress user, you’ll absolutely want this upgrade.

—Susan Ginert
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Logitech Z340 Subwoofer system w/ Speakers
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- (2) Serial, (1) Parallel
- AMD Athlon Cooling Fan w/ Large Heatsink
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- (7) Expansion Bays, (2) Sliding Side Panels

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- (3) Firewire Ports
- (2) Serial, (1) Parallel
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- Intel Pentium 4 2.0 GHz  $699

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### Operating Systems

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Bored with TV? Try Liketelevision. This video-on-demand site specializes in vintage television shows, movies, cartoons, and short subjects. You won't find the latest Hollywood blockbuster, but you will find The Andy Griffith Show, Dementia 13 (Francis Ford Coppola’s directorial debut), Superman cartoons, and 1960s- and 1970s-era toy commercials. If your tastes lean toward nostalgia and you have a reliable broadband connection, you'll be in heaven.

LikeTelevision is a subscription-based site, but it offers a free preview section. Basic membership costs $5 per month or $50 per year. You can stream any of the thousands of programs available at the site.

Navigation is easy. Just find what you want and click an icon. Selections are grouped by category, and you can use a scrolling pull-down window to browse them alphabetically. A search feature lets you hunt by keyword. For many programs, you can choose to have the video streamed in a small, medium, or full-screen window.

Streaming-video files are compatible with RealPlayer 8 and require a connection of about 250kbps. For $100 a year, the premium membership lets you download more than 170 programs to your hard drive. The downloadable video files are encoded at 1,248kbps, ensuring good quality with fewer compression artifacts. But be warned: Most are public-domain, so the image quality isn’t that great to begin with. Many look like second- or even third-generation copies.

Although the image quality of the videos could be better, LikeTelevision has some real gems. It offers a respectable selection of Betty Boop cartoons, classic films (Metropolis, Meet John Doe, and Seven Samurai), and classic television series (Your Show of Shows and The Dick Van Dyke Show) that are hard to find anywhere else. And when it comes to the early 1950s TV shows, the uneven video quality simulates the original viewing experience.

—David English

MSN PHOTOS

Online Photos Made Fast and Easy

Yet another photo site? Yes, but MSN Photos is the easiest, most convenient we’ve seen. The site’s automated compression may scare off quality-conscious photographers, however.

MSN Photos is free, except for any photo-related products you buy, and the “cost” of the information you’ll divulge for the necessary Microsoft Passport account. Once you download and install a small utility, you can use the site’s upload page to search for and preview photos on your hard drive. The utility automatically converts BMP and TIFF photos to the JPEG format, and heavily compresses files larger than 3MB. A 9MB TIFF photo was compressed to 290K, and a 3MB JPEG to 830K. Competitor DotPhoto keeps all your photos at their original compression. MSN Photos uploads large photos much quicker than DotPhoto, at the expense of some image quality.

MSN Photos also lets you download the photos from your albums; most sites allow only uploads. The images remain compressed, however, so they may not be of the same quality as the original versions.

You can arrange your photos into albums for private or public access. The site provides a set of easy-to-use editing tools, including red-eye removal. Sharing your photos is as easy as selecting them and typing in e-mail addresses. The site then creates the shared album and sends out invitations. You can purchase a wide range of photo-related products, including prints, posters, T-shirts, hats, mugs, and mouse pads. MSN’s prices are competitive, but not always the cheapest. A 4-by-6-inch photo is 49 cents, which matches Ofoto and Shutterfly, but is soundly beaten by DotPhoto’s 29 cents.

Although MSN Photos is an excellent choice for casual photographers, it’s less than ideal for dedicated hobbyists who want high-quality prints. It’s okay for viewing snapshots online, but when ordering large prints or posters, it can be a high price to pay.

—D.E.
Roll Your Own Roller Coaster

**EDITORS' RATING: 7.5**

If you've ever fantasized about building your own roller-coaster ride, your wish has come true. Ultimate Ride lets you create and experience three different types of coasters: wooden, steel, and hanging.

In addition to the build mode, which allows you to construct any kind of coaster without restrictions, the game features an "imagineering mode," a series of puzzle-solving scenarios where you must build or modify coasters to meet certain requirements.

Players who are sticklers for realism may be disappointed by the lack of couplers between cars and the somewhat blocky, oversimplified 3D objects. And it would be nice to see passengers in the cars. Still, the graphics are functional, and the multiple camera views and smooth animations do a good job of imparting the feeling of being on a speeding coaster.

Where the game gets tricky is when a coaster doesn't meet the requirements and you have to adjust it. If you add an accelerator, you might find the added speed results in a lateral G-force around a curve that exceeds the safety guidelines. But switching tracks isn't easy since you can't swap one section for another without replacing all the sections after it.

Ultimate Ride's great premise is sure to appeal to roller-coaster fans of all ages. Although the game's graphics and sound leave room for improvement, they do a good job of conveying the sense of riding a roller coaster, and the straightforward interface makes it easy, once you've learned the basic commands, to create the ride of your dreams.

—Trey Walker

Disney Interactive; $39.99

www.ultimateridegame.com

You Don't Know This Jack

**EDITORS' RATING: 8.8**

In Jack Orlando: A Cinematic Adventure, a down-on-his-luck private eye has been framed for murder and has 48 hours to clear his name. As Jack, you must solve a series of pretty good puzzles, stomach some of the worst voice-acting ever, and navigate so many red herrings that you'll wonder if you're playing a game or swimming in Agatha Christie's fishpond.

But this is merely a strange game; it's a strange game that's almost 4 years old. Originally released in 1998 by overseas developer TopWare, Jack Orlando is only now debuting in the United States. Nevertheless, the game has an incomplete feel to it, from the endless streams of meaningless dialogue to the enormous areas in which there is absolutely nothing to do.

Such surreal moments aside, Jack Orlando is, at its heart, a straightforward murder mystery with standard adventure-game-style inventory- and dialogue-based puzzles. But what makes the game interesting is that it isn't simply a case of using everything you find. You can gather dozens of items that are completely useless, and have many conversations with other characters that lead you nowhere. It makes for an interesting change of pace from the standard adventure formula, in which every step is contiguous on the one that went before.

Despite all that's wrong with it, Jack Orlando's puzzles will certainly appeal to serious adventure-game fans, and the mostly two-dimensional, hand-drawn art is a nice variation from the standard 3D of most modern games. The game can even be entertaining, assuming you can tolerate its terrible dialogue and strange dead ends.

—Ron Dulin

(JoWood Productions; $39.99)

Monopoly Tycoon

**EDITORS' RATING: 8.5**

Most PC games based on Monopoly have either combined the classic board game with another popular license, as in Monopoly Star Wars, or used the Monopoly brand to spruce up another type of game, as in Monopoly Casino. Monopoly Tycoon breaks the mold by using its famous namesake as a base on which to build a great-looking, real-time game of business management and city building.

You begin with a set amount of money in 1930, at which point the game's virtual city is only sparsely built. You then build businesses and invest in property, utilities, and railroads. The game has a wide range of single-player scenarios, as well as six customizable multiplayer modes. (You should have no trouble finding online opponents using the provided GameSpy Arcade software.)

Perhaps Monopoly Tycoon's most striking feature is its simple but powerful 3D engine. The virtual city is colorful and lively, with automobiles, pedestrians, and even boat traffic. The 3D computer-controlled opponents, inspired by the original Monopoly game tokens, are entertaining as well, although you only see them during property auctions. Music is also well-integrated; as the game progresses through time, the soundtrack changes to fit each era.

Those who relish the classic Monopoly game's blend of chance and strategy may find Monopoly Tycoon weighs too heavily on the strategy side. But many Monopoly fans will appreciate the game's entertaining premise and its strong combination of crisp graphics and varied gameplay.

—T.W.

Infogrames; $39.99; www.monopolytycoon.com

For more game reviews, go to gamespot.com.

Computer Shopper • FEBRUARY 2001

101
The 2GHz Pentium 4 processor sets a new computing milestone, but will it restore the luster to Intel's crown?

BY BILL O'BRIEN

With the introduction of the 2GHz Pentium 4 CPU, Intel has added a potent new weapon in its battle with AMD for supremacy in the processor market. In addition to boasting the fastest clock speed of any computer processor to date, the 2GHz processor further narrows the price/performance gap between Intel's Pentium 4 lineup and AMD's latest Athlon XP processors. The timing couldn't be better for Intel. Between its own competitive pricing on the Pentium 4 and with RDRAM prices at an all-time low, vendors are able to package cutting-edge systems without stratospheric prices.

That's not to say that the technology comes cheap. Like any new processor, the 2GHz Pentium 4 is best served in a high-end setting, as evidenced by the five systems gathered for this roundup. These new offerings from ABS Computer Technologies, Dell Computer, Hewlett-Packard, MicronPC, and Polywell Computers have much in common, including 256MB of fast RDRAM memory, GeForce3-based graphics cards with 64MB of DDR SDRAM, DVD-ROM and CD-RW drives, 19-inch monitors, and large (at least 40GB) hard drives. Moreover, while all of these computers were tested under Windows Me, don't be surprised if most ship with Windows XP, which can provide as much as a 10 percent boost in overall performance.

As similar as these systems are in components and price, some subtle differences weave through them. For example, the ABS Performance 8, HP Pavilion 9900, and Polywell Poly 850GB-2000 all provide IEEE 1394 (FireWire) ports for connecting a digital video camera,
whereas that feature is absent from the Dell Dimension 8200 and MicronPC Millennia Max XS. The five vendors opted for less subtle differences in the choice of speaker systems and in the speeds of the CD-RW drives.

Clearly, however, all of these systems target power users: ardent gamers, multimedia enthusiasts, and serious home-office and corporate customers. Suffice it to say, those looking for a system that merely "fast" would best look elsewhere.

ABS PERFORMANCE 8

**Editors' Rating: 7.7**

**Pros:** Powerful audio/video performance; great gaming bundle; three niece EEE 1394 ports

**Cons:** Optional onsite service; second-tier productivity suite

**The 2GHz Pentium 4 processor may command top billing in the ABS Performance 8, but it's the supporting players that make this desktop a must-see for entertainment buffs.

ABS has stocked this $2,274 direct system with some of the finest components money can buy, starting with its Altec Lansing 641 speaker system, a powerful five-piece configuration that overwhelms any of the speakers bundled with the other four systems here. Driving it is an equally impressive sound card: Creative Labs' Sound Blaster Audigy Platinum, which features a bay-mounted connection-and-control center that eliminates the need to crawl behind your computer to hook up devices such as microphones, headphones, and analog or digital recording equipment.

Things get even more interesting when you load a DVD movie into the DVD-ROM drive and light up the 19-inch Hitachi CM715 monitor. The monitor's 0.22mm dot pitch delivers crisp graphics all the way up to 1,600 by 1,200. If you prefer gaming, the system's Leadtek WinFast GeForce3 TD graphics card is more than up to the task. You're also ready for basic video production with Ulead video-capture and -editing software and three IEEE 1394 ports (one of which is on the Audigy module).

When compared with a typical 1.8GHz Pentium 4 system, the ABS displayed a 14 percent jump in overall performance, as measured by our WAPCO SYSmark 2001 test. That's actually a bit more than we'd expect from an 11 percent increase in clock speed. But then, 2GHz is a lot of processing horsepower, and it's giving both graphics and hard drive performance a boost as well.

In addition to its stellar hardware lineup, the system ships with a comprehensive gaming bundle that includes DroneZ, Gunlok, Deus Ex, MDK2, and Unreal Tournament. Also included are Corel WordPerfect Office 2002 (a capable, though less popular, suite than Microsoft Office), Easy CD Creator 5 Basic, and Ulead VideoStudio 4.0 SE Basic.

ABS backs the system with a three-year parts and lifetime labor warranty, though toll-free tech support is available only during West Coast business hours. (Around-the-clock phone support and onsite service are optional.) Still, if you're looking for a top-of-the-line computer that leaves absolutely nothing to be desired, you'll find it in the ABS Performance 8.
This time last year, Dell's top-of-the-line Dimension was the 8100. Equipped with a 1.5GHz Pentium 4 processor, 128MB of RDRAM, a GeForce2 GTS Ultra-based graphics card, and a 30GB hard drive, it was priced around $3,300. Now, Dell's Dimension 8200 comes stuffed with a 2GHz Pentium 4, twice the memory, a faster graphics card, and twice the hard drive space. And, at $2,376 direct, it's yours for almost $1,000 less.

Dell's connect-the-dots documentation provides an illustrated step-by-step setup that clearly displays where cables attach. All software comes preinstalled; in our evaluation system, that meant Windows Me, as well as Microsoft Works Suite 2001 with Money 2001. Windows XP is an option.

Whether you're watching movies or playing games, the Harman Kardon HK-695 three-piece speaker system puts out competent, if not wall-rattling, sound. The next step up is the THX-certified Altec Lansing ADA995, which sounds great but bumps the price about $170.

Dell's new minitower case puts two USB ports and a headphone jack up front where you need them, although digital-video enthusiasts will mourn the lack of any IEEE 1394 connectors. Getting inside the case may seem awkward at first, but it's actually quite a smart design, calling to mind that of the Power Mac. You press a button on the top and bottom of the case to release latches, and the case opens up like a book stood on end. The motherboard moves to one side and the drive bays to the other, giving you maximum access to all areas with minimal obstructions.

Of course, unless you feel compelled to fill the single available PCI slot or one of the two available 3.5-inch drive bays (one internal, one external), you may never need to poke through the guts of your new Dimension. Dell covers the PC with one year of onsite service, plus a year of 24/7 toll-free phone support. (You can also choose from a variety of optional plans to extend the coverage.) But the electronic documentation and online help are so good you may never need to call for help.

Everyone is angling for your computing dollars, and Dell's claim to your wallet rests on the quality of its components and the strength of its support—both nice complements to the raw power of the Dimension 8200.

HP Pavilion 9900

PROS: Three IEEE 1394 ports; wireless keyboard; large hard drive
CONS: Spotty standard warranty; no toll-free technical support

With its soft, rounded edges and conservative gray-black color scheme, the $2,404-direct HP Pavilion 9900 looks like a mild-mannered home PC. But its state-of-the-art processor, 256MB of RDRAM, and all-star component lineup clearly qualify it as a multimedia powerhouse.

Like the other four systems here, the Pavilion 9900 was able to encode MPEG files about 8 percent faster than the last generation of Pentium 4 systems. That's relevant because our evaluation system came with everything you need for digital video editing, including three IEEE 1394 ports, a copy of Pinnacle Systems' Studio DV, and a cavernous 80GB hard drive.

You'll have as much fun watching movies as making them with this Pavilion. The configuration we tested included both CD-RW and DVD-ROM drives, and the upscale 19-inch MX90 monitor, which has a 0.26mm dot pitch and maximum 1,600-by-1,200 resolution. Even though the three-piece Polk Audio AMR50 speaker system is not in the same league as the Altec Lansing system offered...
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Dell Home Desktops

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• 40GB Ultra ATA/100 Hard Drive (7200 RPM), add $20
• 16X/10X/40X CD-RW drive with Roxio's Easy CD Creator®, add $60

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$1099 or as low as $33/mo for 45 mos. 12
No payments for 90 days for qualified customers
E-VALUE Code: 0820-500110d

Recommended upgrades:
• 256MB SDRAM, add $80
• 18" (18.0" vis., 260dpi) M911 Monitor, add $140
• Harman Kardon HK-395 Speakers with Subwoofer, add $30

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Each DELL system shown here has a number of standard features, including:
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Dell | Solutions

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Short-Distance Running

Given the ramp-up in computer processor speeds over the last few years, the distance data needs to physically travel inside a CPU plays an increasingly vital role in how fast things really move.

The Pentium III debuted using 0.25-micron technology and, over the course of its life, shrunk to a 0.18-micron design. If the speed of the CPU had remained constant during that time, internal operations would have occurred, theoretically, nearly 28 percent quicker because of the shorter distances. When Intel shrinks the Pentium 4 down from its current 0.18-micron technology to 0.13-micron, the distances inside the CPU decrease by another 27.8 percent.

You won't necessarily see a corresponding boost in performance from simply decreasing the die size, however. Electrical theory adds other rules and impediments, just as the speed of light decreases when it's traveling through a medium other than a vacuum. Still, if you keep the speed and the medium constant while shortening the distance traveled, whatever you send through that medium will get where it's going quicker.

Moreover, as you decrease the amount of space required by the CPU, more room becomes available to add components to the chip. The jump from external L2 cache to internal L2 cache, for example, was one of the biggest benefits of downsizing CPUs. The 0.13-micron Northwood Pentium 4, along with its smaller die size, will reap the additional benefit of having twice the internal L2 cache as its Willamette Pentium 4 predecessor.

Faster clock speeds, shorter distances between chip components, and more on-die features to take advantage of the decreased distances—these will be the essential building blocks for shifting personal computing into high gear.

with the ABS Performance 8, it still produced rich, full sound.

As was typical of our sampling of 2GHz systems, the Pavilion 9900 is stuffed with hardware. The 19.5-by-8.5-by-19.5-inch minitower has two front-accessible and one internal drive bay available for expansion, but only one vacant PCI slot. To be fair, with front- and rear-mounted USB and IEEE 1394 ports, a modem, and an Ethernet card already included, the system doesn't want much. The case is tool-free, as is the backplane, but you'll need a screwdriver to access the drives.

The system's only real weakness is HP's warranty. Tech support is available 24/7, but it's a toll call. Parts and labor are covered for one year, but you must ship the system back to HP for repairs; HP covers the shipping cost both ways. We recommend that you purchase the optional $169 three-year in-home warranty.

Our test system included a few nice touches, such as a wireless keyboard and mouse. But if you stick with a standard keyboard and mouse, a 17-inch monitor, and the base two-speaker system, you can save about $400. Either way, the HP Pavilion 9900 is a solid offering that deserves serious consideration.

MICRONPC MILLENNIA MAX XS

3DMARK2001 RATING: 1.7

PROS: Onboard warranty standard, two front-mounted USB ports

CONS: Lackluster speaker system, no IEEE 1394 ports

It's name notwithstanding, there's actually very little XS in this Millennia Max. Nevertheless, MicronPC's $2,195-direct system artfully balances value with performance, delivering a flexible configuration with just about everything you'd want, from plenty of storage to a fast graphics card.

Our evaluation system came equipped with a moderately sized 40GB hard drive, a GeForce3-based graphics card, and a Sound Blaster Live Value sound card. This system also comes standard with MicronPC's 910EX 19-inch monitor. DVD playback is quite clear on the 910EX, which offers a 0.26mm dot pitch with a top resolution of 1,600 by 1,200 at 75Hz.

Those curious to see where the corners got cut, however, need only pop in an audio CD for the answer. Although the two-piece Altec Lansing AVS200 speaker system produces remarkably clear audio, even at higher volumes, it is clearly a low-fi model. Our advice: Take the $29 upgrade to the ACS33 satellite-subwoofer package.

MicronPC helped pioneer the tool-free case, and the Millennia Max XS sports a tool-free backplane to simplify interface-card
Introducing the new TRÜ™ XP system by Thompson's Computer Warehouse, featuring the AMD Athlon™ XP processor with QuantiSpeed™ architecture which boosts overall productivity and enables the ultimate computing experience. Well suited for business, home office, gaming, and personal use, this flexible platform has the features needed for today's demanding applications and leaves room for future expansion. By choosing the durable TRÜ™ XP Home system for your home office, the TRÜ™ XP Pro for the Business Professional, or the powerful TRÜ™ XP Gamer for the hardcore gamer, you're getting a processor designed to run flawlessly on the world's most popular software and a system that delivers next generation features that will give you the power to perform.

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*Due to FCC rules that restrict power output, current download speeds are limited to 538kps, upload speeds are limited to 338kps. Actual speeds may vary depending on line conditions. Actual items may differ from picture. **QuantiSpeed architecture operates at 1400MHz. ***QuantiSpeed architecture operates at 148MHz. ****QuantiSpeed architecture operates at 1533MHz.
upgrades in its two empty PCI slots. The minitower case has one internal and two front-accessible 3.5-inch bays open for expansion. They’re tool-free, too.

Our test model came with Norton AntiVirus 2002 and Microsoft Office XP Small Business. MicronPC also offers bundles for various business-applications courses via its MicronPC University.

MicronPC’s standard warranty consists of 24/7, toll-free technical support and a one-year onsite parts-and-labor warranty. The company also offers a large array of optional plans, such as Priority Access technical support ($39, $59, or $69 for one, two, or three years, respectively) and an additional two years on parts for $100. Web-based tech support is thorough and well-organized, with driver downloads, documentation, and a tool that lets you look up your system by serial number.

While it’s not the most decked-out 2GHz system available, the MicronPC Millennia Max XS is a smart choice for small or home offices where audio/video performance is not a top priority.

**POLYWELL POLY 850GB-2000**

*Editors' Rating: 7.4*

**Pros:** Solid speaker system; IEEE 1394 ports

**Cons:** Spotty warranty; slow RAID controller; second-tier productivity suite

Polywell’s penchant for brushed-aluminum cases carries over to its new $2,245-direct Poly 850GB-2000. Inside the silver tower, you’ll also find another Polywell staple, an ATA/100 RAID array with dual 40GB drives.

When that disk space is combined with the system’s top-of-the-line CPU, GeForce3-based graphics card, dual IEEE 1394 ports, and bundled Ulead VideoStudio software, you have everything you need for digital video production. The Poly 850GB-2000 uses a 3ware Escalade 6000 ATA 33/66 storage switch to configure the drives as an 80GB virtual drive using RAID 0 striping. Still, we’d have preferred one of the Escalade 7000-series boards for video work, because the more upscale ATA/100 RAID version is rated about 80 percent faster for reads and almost 50 percent faster for writes. The Poly 850GB-2000 is also outfitted for other multimedia uses, with CD-RW and DVD-ROM drives, as well as an ear-pleasing Cambridge Audio

**Polywell Poly 850GB-2000**

SoundWorks five-piece PCWorks FourPointSurround speaker system.

You’ll find plenty of ports and room for drives in the system’s spacious desktop case, but no vacancy for cards. Of the 10 drive bays, seven are front-accessible (four are vacant), three are internal (with one still free), and all are within easy reach of the various drive interfaces. All five PCI slots are occupied, however. The case itself is tool-free, as is the interface-card backplane.

At its maximum resolution of 1,600 by 1,200, we found that the included AOC 9GLRS 19-inch monitor turned out a slightly fuzzy, albeit flicker-free, display at 75Hz. Nevertheless, it’s well-suited for a typical range of graphics and video playback.

Polywell’s basic warranty is a mixed bag. The Poly 850GB-2000 is covered by a three-year parts/five-year labor warranty with repairs handled by return shipping; onsite service is optional. And although toll-free tech support is available around the clock, it’s free only for the first year and is provided by a third-party company—hardly the personal touch.

Despite that and the lackluster Lotus SmartSuite for Windows productivity suite, the Polywell Poly 850GB-2000 comes well-equipped for what most of us want to do, even at the higher end of the computing spectrum. Demanding users will probably want to upgrade the RAID controller, however; it will bump up the cost a bit, but raise the system’s overall value.

**GIGAHERTZ GALORE**

Although these are all good systems, some are slightly better than others.

If home entertainment and 3D gaming are as important to you as top-notch performance, the ABS Performance 8 leads the pack by a nose. The Dell Dimension 8200 also delivers consistent across-the-board performance. It’s good for both work and play, and its year of onsite coverage is a strong point. MicronPC’s Millennia Max XS isn’t far behind, though it clearly comes out for better speakers. The Polywell Poly 850GB-2000, meanwhile, has a few desirable features (including its reasonable price, IEEE 1394 ports, and five-piece speaker system), but it’s hindered by its middle-of-the-road RAID array and quirky support package. By the same token, Hewlett-Packard needs to improve the Pavilion 9900’s weak warranty, which, among this bunch, places a distant last.
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Remember when DVDs and four-channel games threatened to make conventional stereo obsolete? Well, a funny thing happened on the way to multichannel nirvana: Three-piece satellite-subwoofer speaker systems came roaring back with an unbeatable combination of sonic excellence, wall-shaking volume levels, and affordable prices.

One company that helped engineer this two-channel renaissance was Sonigistix, which dazzled critics with a stunning line of affordable three-piece computer speakers based on the company's formerly expensive flat-panel technology. Just as significant was Lucasfilm's decision to extend its THX certification program to the desktop. [See the sidebar, "THX Spells Success."] High-end THX-certified systems such as those in the Klipsch ProMedia line blew over the competition regardless of how many channels they offered. At the low end, manufacturers like Logitech and MidiLand pushed the envelope with surprisingly accurate three-piece systems priced well under $100. It didn't take users long to realize that first-rate stereo speakers could deliver as satisfying a listening experience as more costly and complicated multichannel models.

In this feature, we look at the latest wave of top-notch three-piece computer speakers. In addition to impressive offerings from Klipsch and Sonigistix, we evaluate hot new contenders from Altec Lansing and Harman Multimedia, as well as a recent entry-level system from Logitech that is quickly garnering impressive street credentials. Although none of these systems produces a true immersive listening experience, they are the ones to audition if you're looking for spectacular two-channel sound.

Don't have the space (or the patience) to set up a 5.1 speaker system? No problem. The latest three-piece computer speakers are better than ever.

BY DON LABRIOLA
A

ite Lansing's 621 looked like a Klipsch-killer on paper. But when we fired it up, this potentially great product was knocked out of the running by a few unfortunate engineering decisions.

The $179-list 621 is a massive speaker system, physically larger than any other model in the roundup. But size alone is no substitute for a solid design. The subwoofer's huge cabinet appears too large for its driver, forcing the cone to pump out lower bass frequencies that it can handle. The result is a boomy bottom that turns drumbeats and bass notes into dull thuds.

The 621 does better in the upper registers, producing output that sometimes rivals even the best speakers in the roundup. Isolated peaks in the satellites' frequency response add some harshness and a pinched, metallic quality to some percussion instruments, though these are relatively subtle effects. The real problem is in the lower midrange, which was overwhelmed by excessive bass output when we played bottom-heavy test material.

Altec also erred by setting the gain of the system's amplifier higher than that of most computer speakers. This was done so that the 621 could be connected to lower-output devices such as portable CD and MP3 players, but the result was horrific distortion when we set our sound board's volume above the halfway mark. Just as disappointing was the fact that the 621's otherwise-clean upper midrange quickly became muddy at higher volumes, evidently because the amp was being pushed to play louder than its power supply would allow.

The 621 could have been a terrific selection had its designers adhered to generally accepted principles of speaker cabinet and electronics design. It sounds great when playing certain types of material at lower volume levels, but if you crank it up or feed it too much bass, the output quickly turns into a muddy mess.

**HARMAN CHAMPAGNE SE**

**EDITORS' RATING:** 6.2

**PROS:** Surround sound; four-channel emulation; integrated diagnostics; bass unit designed for desktop or floor placement

**CONS:** Spatialization effect sounds like it's always on; limited bass; no remote

Harmar Multimedia's Champagne SE casts a striking profile, but its slick design and novel packaging weren't enough to warm us to the system's idiosyncratic sound.

Each of the satellites in this $169.95 direct system packs two 1.4-inch (34mm) drivers into a thin, vertical chassis reminiscent of Altec Lansing's exclamation-point-shaped ATP satellites. The bass module, too, is a tapered cylinder loaded with a front-mounted 5.25-inch driver and downward-firing port. The system's plastic wood-tone finish notwithstanding, the overriding impression is that of a pair of champagne glasses and an ice bucket.

The satellites' Harman Odyssey drivers are high-excision inverted cones capable of extracting surprising bass response from tiny enclosures. Just as innovative is the magnetically shielded subwoofer, which is designed for placement on the floor or the desktop.

The Champagne is loaded with other nifty features, such as integrated diagnostics that generate test-tone sweeps, and a spatialization function that broadens the sound field when playing a stereo source. If you drive the speakers with four-channel input, the system will even attempt to simulate multichannel output from two satellites.

Our big problem with the Champagne is its sound quality. The underpowered subwoofer produces snappy output in the upper registers, but not much else. The Champagne's high end is a bit bright as well, and gets downright harsh at higher volume levels. Indeed, its overall perfor-
mance can't match the impressive dynamic range of the Altec Lansing, Klipsch, and Sonigistix systems we tested. Worst of all, the Champagne SE's midrange lacks clarity and suffers from fuzzy imaging. (If we didn't know better, we'd swear that the system's spatialization function is never totally shut off.)

Many users will no doubt find the Champagne SE's spacious, unfocused sound pleasant enough to listen to, but other systems reviewed here offer flatter frequency response, greater dynamic ranges, and superior detail and imaging at lower prices.

**KLIPSCH PROMEDIA 2.1**

**EDITORS' RATING 8.5**

**PROS:** incredibly loud; extended high/low ends; THX certification

**CONS:** midrange doesn't keep up with high/low ends; no tone controls; no remote

The Klipsch ProMedia 2.1 sounds as terrific today as it did when it first shipped a year ago. Priced at $179 direct, this THX-certified system boasts 200 honest RMS watts of power that produce clean output, bottomless bass, and head-banging volume levels without even breaking a sweat.

Most impressive is the ProMedia's 130-watt bass module, one of the few PC-speaker units that actually lives up to the "subwoofer" label. Regardless of test material, it pumped out a deep, tight bottom that never sounded strained. Plucked bass notes had snap, kick drums were punchy, and the system delivered some of the most convincing percussion sounds we've heard on the desktop. Best of all, the subwoofer turns out the same top-notch performance at even the highest volume levels, never becoming boomy or spilling bass output into the midrange.

The satellites are almost as remarkable, producing an extended, detailed high end with only the slightest hint of brightness. The system's midrange is outstanding, often rivaling that of the unbeatable Sonigistix Monsoon MM-702 in our comparison testing. The ProMedia satellites do have a warmer, less detailed sound than the MM-702, which some listeners may actually prefer over the unflinchingly accurate Sonigistix sonics.

The ProMedia 2.1 is a flashy, powerful system that has been a relentless crowd pleaser since its introduction. It offers ear-splitting volume levels, an unparalleled low end, and upper registers that only waver in comparison to those of the Sonigistix MM-702. The ProMedia isn't quite an audiophile speaker system, and it lacks convenience features like a handheld remote and tone controls. Still, it's a great choice for two-channel gaming and will delight all but the most demanding stereo-music fans.

**LOGITECH Z-340**

**EDITORS' RATING 7.2**

**PROS:** Good sound at a low price; easy wall mounting; headphone jack

**CONS:** Lacks deep bass; no remote; no tone controls

Logitech's audacious little Z-340 isn't in the same class as most of the other systems in this roundup. But it holds its own against much costlier competitors and, selling for around $50, costs about a third as much as the Sonigistix MM-702 (the next-most-expensive entry).

The Z-340 is a basic-black system that includes few luxuries beyond a headphone jack and dual-purpose satellite stands that double as wall-mounting brackets. Each of its tiny rounded-cube satellites contains a single 2-inch driver, and a modest 20-watt amp powers its midsize subwoofer.

Nonetheless, the Z-340 produces surprisingly realistic output. Its upper midrange is spacious and detailed enough to convincingly reproduce subtle room reverberations and capture a singer's breaths between phrases. The system shines on material like a cappella vocals, small-ensemble chamber music, and
acoustic guitar. Also, it has no problem hitting moderately high output levels and, unlike many smaller systems, its sound doesn’t degrade significantly when it nears the top end of the volume dial.

The Z-340 has even less low end than the Harman Champagne SE, but what’s there isn’t bad. All but the lowest notes of a bass guitar sound fine, and the subwoofer does a good job with bass transients. However, it can’t reproduce the deepest frequencies necessary to give real punch to bass drums, tympani, piano, and other challenging instruments.

If the system sold for twice as much, we’d also criticize its midrange colorations, slight tendency to sizzle at the top end, and lack of extreme high frequencies. But we’d also have a hard time finding another speaker in its price range that doesn’t suffer from these types of problems to a much greater degree.

The Logitech Z-340 can’t match the Klipsch or Sonigistix systems’ transparency, inner detail, and smooth frequency response, but it comes awfully close for the money. If there’s no way you can justify spending a three-figure sum for computer speakers, this is the system to consider.

SONIGISTIX MONSOON MM-702 FLAT PANEL AUDIO SYSTEM

EDITORS’ RATING 8.8

PROS: Superb midrange; high end; outstanding imaging; low price for full-range flat-panel satellite; tilting stands

CONS: Little output below 50Hz; no tone controls; no power switch on remote

It’s hard to find fault with Sonigistix’s Monsoon MM-702 system. Based on the same proprietary Planar Focus Technology (PFT) flat-panel technology that drives Sonigistix’s legendary Monsoon MM-1000, this spectacular $149-direct system sounds almost identical to its far-costlier sibling from 200Hz up.

Sonigistix showed great savvy in approaching the booby-trapped task of designing a flat-panel system that would sell for less than $200. Instead of compromising its proven PFT technology, the company developed a smaller, more efficient bandpass subwoofer that produces decent output with less amplification. This new bass module doesn’t match the dynamic range or extended low end of the MM-1000 subwoofer, but it’s tight, accurate, and capable of reproducing every mallet strike in a well-recorded tympani roll.

As you’d expect from speakers based on Sonigistix flat-panel drivers, the MM-702’s satellites deliver true audiophile sound throughout their frequency range, with richly detailed, uncolored sound, rock-solid imaging, and high-frequency response that seems to go on forever. The satellites also benefit from Sonigistix’s newly designed tilting speaker stands. Because the PFT panels radiate sound in a straight line, both satellites must be aimed directly at your head to produce a proper high end and solid imaging, a job these elegant stands accomplish with aplomb.

Compared to the Klipsch ProMedia 2.1, the Sonigistix speakers are clearly more accurate down through the upper bass. Unlike the ProMedia, their midrange is always in proper balance with the high and low ends, and they produce uncompromised sound with even greater detail, transparency, and presence than the Klipsch. They can’t match the Klipsch system’s ability to effortlessly rattle floors and walls, but they do generate impressive volume levels and bass output for a 35-watt system.

Arguably the most accurate system on the market for under $200, the awesome Monsoon MM-702 blows away the competition—and does so at the second-lowest price here.

A SOUND CONCLUSION

You probably couldn’t find five more dissimilar satellite-subwoofer systems than the ones reviewed here.

Logitech’s inexpensive Z-340 is far from perfect, but it’s a great performer for its price, while the THX-certified Klipsch ProMedia 2.1 is a high-powered system capable of incredible volume levels and breathtaking bass. Still, our favorite was Sonigistix’s Monsoon MM-702 Flat Panel Audio System, which, although lacking the Klipsch’s dynamic range and low end, produces some of the most realistic output we’ve heard from a computer sound system.

Harman Multimedia’s Champagne SE produces affable output that can make even the grungiest MP3s easy to digest, but it does so at the cost of compromised imaging, detail, and bass response. Last, we were disappointed by the Altec 621, a large, poorly designed offering that tries in vain to duplicate the success of Klipsch’s ProMedia line.
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VISA
THE PERSONALIZED PDA

The right accessories and tools can make your handheld a truly personal digital assistant.

BY DAVID ENGLISH

Got accessories? If not, the exploding popularity of personal digital assistants (PDAs) means that you'll find plenty of useful add-ons to choose from. In fact, you could even spend more on alluring extras than on the original handheld itself.

Thrifty shoppers narrow the choices to a few accessories that significantly improve productivity. T.E. van Middelkoop, a high-school student from Hertogenbosch, Netherlands, is big on his little Palm Portable Keyboard. "It's small, so I can take it with me anywhere," he explains. "Folded out, it's an awesome keyboard allowing me to type 10-finger blind."

Arthur Hagen, a Connecticut-based senior system administrator, depends on his Ondata case for safekeeping. "It protects the device, looks and feels good, and even prevents the PDA from slipping out of my shirt pocket," he says.

Choose wisely, and the accessories you buy will stretch the value of your initial PDA purchase. You'll be able to access data from more places with a wireless modem or Ethernet card, get more work done with a full-size keyboard or flash-memory card, as well as tackle new tasks with a camera module, voice-recorder module, or attachable GPS device.

BARE ESSENTIALS

Almost all new Palm-compatible and Pocket PC PDAs have at least one slot...
that can accept modems, flash-memory cards, or other special-purpose expansion cards. Even earlier Palm models, which lack an expansion slot, can be enhanced with externally attached expansion modules and sync-port-connected keyboards.

One of the most popular add-ons is a modem, either wired or wireless. PDA modems tend to be model-, manufacturer-, or platform-specific, so you’ll need to match the device to your current PDA and accept that it may not work with the next one you buy. Examples of wired modems include Shinei International’s ClipModem ($99) and Targus’ Pocket Modem 56K V.90 ($129.99). The ClipModem attaches to the back of a Palm m100. Because the ClipModem is external, it adds considerable bulk, though it does have the advantage of using its own AAA batteries. The Pocket Modem works with Windows CE and Pocket PC devices with a CompactFlash slot. It adds less weight and bulk because of the smaller form factor.

Slot-based wireless modems include the Sierra Wireless AirCard 300 ($399) and the Novatel Wireless Merlin ($299). The AirCard is available as a PC Card for Windows CE devices and the Compaq iPaq Pocket PC (when equipped with a PC Card expansion sled). The AirCard is also available as a Springboard module for the Palm-compatible Handspring Visor. Merlin is another PC Card wireless modem that’s compatible with the iPaq.

Pocket PCs with an available CompactFlash slot can use Enfora’s PocketSpider ($349). Examples of externally attached wireless modems include the Novatel Wireless Minstrel 540 ($369) for the HP Jornada, and the Sierra Wireless AirPath SC300 ($139) for the Sony CLIE.

Flash memory is another popular add-on. These cards come in a variety of sizes to fit a wide range of form factors. The small-size Secure Digital (SD) cards and MultiMediaCards (MMCs) are used in some Palm and HandEra PDAs, as well as Toshiba’s Pocket PC c570. The medium-size CompactFlash memory cards are employed in most Pocket PC and Windows CE devices. And the larger PC Card memory cards are used in some bulkier Windows CE devices, as well as adapter-equipped Pocket PCs, such as Compaq’s iPaq and NEC’s PocketGear. SanDisk and Viking Components sell memory cards in all of these formats.

If you have a Visor, check out Portable Innovation Technology’s versatile MemPlug ($49.95 to $69.95). Depending on the model, it adapts a standard Springboard slot for a SmartMedia card, SD/MMC memory, a CompactFlash card, or a Memory Stick. Other types of PDA memory accessories are dedicated strictly to backup. Northstar Mobile’s MemorySafe attaches to the serial port of selected Palm models and provides 2MB ($19.95) or 8MB ($39.95) for on-the-spot backup and restore capabilities.

**THE Key to SUCCESS**

Having a PDA once meant giving up a comfortable keyboard. Now you can purchase a stowaway fold-up keyboard for many Palm compatibles and Pocket PCs from a variety of vendors.

Palm’s version, the Palm Portable Keyboard ($99), is compatible with the Palm III, V, VII, m100, and m500. Targus has stowaway keyboards ($99.99) for the CLIE, iPaq, Jornada, and Visor. In each case, the full-size keyboard folds into a portable package that’s not much larger than the PDA.

If you need a more rigid keyboard and have a Palm-compatible device, look at LandWare’s GoType Pro keyboard ($69.95) for the Visor and selected Palm models. The GoType keyboard doesn’t fold, so it’s not as easy to carry around, but it’s easier to use on your lap than a fold-up keyboard.

If all you need is a small keyboard for infrequent typing, several solutions are available for Palm compatibles. TT
Tech's SnapNType ($39.95) is compatible with Visor handhelds, with models for the Palm m500 series and iPaq expected soon. It fits over the lower portion of the PDA and provides a 39-key character set. Fellowes' PDA Pocket Keyboard ($39.99) works with most Palm-compatible units. It extends outward from the bottom of the handheld, adding more bulk than the SnapNType. Targus' ThumbPad for Palm V ($39.99) clips to the serial port. Link Evolution's ThumbType ($49.95) takes a somewhat different approach. It's a sticker-type keyboard that attaches to the top of the Graffiti area on most Palm-compatible handhelds and can be removed when desired.

**READY FOR ANYTHING**

Once you move beyond the basics, you'll find a remarkable range of accessories.

Dream up an ambitious function for your PDA, and there's probably someone working to make it a reality.

With digital audio becoming an essential part of our lives, the technology was destined to find its way to handhelds. Most Palm-compatible units do not support digital audio, so manufacturers are using hardware add-ons to provide MP3-playback and audio-recording capabilities. Shinee International's Porteson MP3 player attaches to the back of a Palm m100 series PDA. It has an SD/MMC expansion slot and comes in two versions: One costs $89.95 and has 32MB of internal memory, and the other costs $129.95 and has 64MB of internal memory. InnoGear's Minijam ($69 without a memory card) takes the form of a Springboard card for the Visor. It has a built-in MMC slot; you could purchase multiple 32MB, 64MB, or 128MB MMC cards and organize your music by recording artist or musical style.

If you want to record voice memos, you might choose LandWare's GoVox for Palm III ($34.95). It doubles as a flip cover and can record 99 messages for a total of 8 minutes. A similar model for the Visor, Shinee International's My-Vox ($34.95), is configured as a Springboard module. The Targus Total Recall ($99.99) is another Springboard digital voice recorder. It has 4MB of internal memory for as much as 1.5 hours of recording time.

Like to take pictures? It's a snap to transform your Palm, Visor, or Jornada into a digital camera. Eastman Kodak's PalmPix Camera ($74.95 to $129.95) works with many Palm-compatible models. The m500 Handheld Series model ($129.95) snaps 800-by-600-pixel color pictures and can use the Palm's built-in SD/MMC slot to store hundreds of photos. Hewlett-Packard's Pocket Camera ($169) can convert an HP Jornada into a simple point-and-shoot camera. It has a built-in 3.7-inch color LCD. And Handspring's Eyemodule2 ($199) brings still photography and mini-movie clips to your Visor's Springboard slot. (See the Reviews section for a look at two of these camera modules.)

Those who like to roam can also use the PDA as a Global Positioning System (GPS) device. With the right hardware and software, you'll be pinpointing your position on an onscreen map in real time.

Rand McNally's StreetFinder GPS for Palm IIIc and VII handhelds ($199) turns your PDA into a complete navigation system. Your Palm attaches to an external GPS tracking cradle that syncs with the StreetFinder program to provide your exact location with street-by-street directions to other places. Nextian's HandyGPS Pro ($199.99) and Thales Navigation's Magellan GPS Companion ($199) perform similar functions for the Visor. DeLorme's Earthmate Road Warrior Edition ($199.95) provides a GPS receiver that plugs into the serial port of the CLIÉ and selected Visor and Palm models.

In a corporate environment, the network is often essential for the distribution of data. To this end, Xircom offers the Wireless LAN Module ($299) for the Palm m125, m500, and m505, as well as the SpringPort Wireless Ethernet Module ($298.99) for the Visor. Both support the 802.11b (Wi-Fi) standard for speeds as fast as 11mbps. If your company is going with Bluetooth instead of 802.11b, Xircom's SpringPort Bluetooth Module ($298.99) is expected to be available early this year. It works with Visor handhelds and has an effective range of about 32 feet. (The 802.11b devices, by contrast, have a maximum range of roughly 300 feet.) If you don't need wireless, check out Portsmith's Ethernet Cradle ($199), which works with many Palm and Visor models. It supports standard 10mbps or 10/100mbps Ethernet connections.

**CUSTOM CASES**

Not all PDA accessories are electronic add-ons—cases and styli are also hot sellers. Some of the cases are formfitting, so you can tuck your PDA into a coat pocket, while still giving it some degree of protection.
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Esoteric and Exotic Add-Ons

Here are some PDA add-ons that meet niche needs and demonstrate just how pervasive and integral to our daily lives PDAs have become.

What’s the sound of one hand typing? Find out with Matias’ Half Keyboard ($99). The device looks like the left side of a full-size keyboard, but when you press the spacebar simultaneously with another key, it emulates the missing right side of the keyboard. It’s compatible with Palm and Visor models, and it frees up your other hand for the stylus.

As games have matured on the Palm, so have the game controllers. One of the most unusual ones, TT Tech’s SnapNPlay ($29.95), adds an eight-way directional pad and two fire buttons. It also has a vibration function that lets you feel the dynamics of the game through coordinated shock vibrations.

If you love taking your PDA for a drive, you’re a prime candidate for Arkon Resources’ Universal Multimedia PDA Mounts. The Vent Mount Multimedia Kit ($69.95) fastens onto your car’s heating/air-conditioner vents. The Cup Holder Multimedia Mount ($69.95) fits into a standard automobile cup holder, and the Windshield/Console Multimedia Mount ($69.95) employs three suction cups to adhere to your car’s windshield.

Others are large enough to stow additional items, such as expansion cards, extra batteries, a stylus, or even an AC-power adapter. These, obviously, are not as pocketable.

Fellowes’ Bumpers ($29.99) are rubberized, water-resistant cases that are barely larger than the Visor, Palm III, and Palm V models they protect. If you want something even sturdier, RhinoSkin’s titanium cases ($99.95) are made from 100 percent Grade I titanium, and are available for selected Palm and Visor models. The company also makes aluminum cases ($49.95) for the Jornada and iPaq. If you prefer something more traditional, check out Ondata’s Palm V Case ($130) made from hand-stitched Italian leather.

Larger cases include Fellowes’ PDA Travel Portfolio ($29.99), which has compartments for credit cards and notepads, holders for a pen and stylus, and a Velcro attachment to secure your PDA. Fellowes also has an ingeniously designed PDA Keyboard and Case ($95.99). It supports the Palm III (though not the IIc), Palm V, and Visor. When open, your PDA is on the left side, and a full-function keyboard is on the right.

Perhaps the ultimate PDA case is Seiko Instruments’ SmartPad2 ($199.99). It has room for your PDA, cell phone, combination stylus and ink pen, built-in keyboard, and 5-by-8-inch notepad. The notepad transfers your notes and drawings directly to your handheld via an infrared transceiver. The SmartPad2 is compatible with the Visor, CLIÉ, and HandEra TRKpro, as well as the Palm III and later Palm models.

The look, size, and feel of a stylus is a personal matter. LandWare’s Floating-Point Stylus ($13.95) is compatible with the Palm III, V, VII, and m500 series. It features a pressure-sensitive tip to provide better comfort and less wear on the screen. Fellowes has three stylus models: the PDA StylusPen ($6.99), Slimpoint StylusPen ($12.99), and Premier StylusPen ($24.99). All three can morph from a stylus to a pen with a single click. And Yasutomo’s popular Multi-Point Pens and Quad-Point Pens can be equipped with a special Stylus Tip ($1.99) that transforms one of the four colored-ink pens into a stylus.

These products only scratch the surface of the pile of PDA accessories available. In general, you’ll find a broader selection for the most popular models, and fewer for older and discontinued models. Favor brand- or model-specific accessories only if you know you’ll stay with the same brand or model when making future PDA purchases. It may make more sense to buy a new-model PDA than to upgrade an old one’s capabilities piecemeal. You may also find that a PDA loaded with accessories is too much to carry, so think about how you use the device and concentrate on filling any significant gaps. The key to buying PDA accessories is to ask if each item truly increases your productivity.

Get the Gear

These sites all stock a wide selection of add-on products for PDAs. They’re all great places to start—and finish—you shopping for handheld accessories.

Handango, www.handango.com
iGo, www.igo.com
MobilePlanet, www.mobileplanet.com
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Increase productivity by up to 22% on business applications*. Boot and load applications quickly. Enjoy efficient multitasking when using multiple peripherals and a responsive, rich Internet experience. And that's just the beginning! When you buy a Systemax PC, it's like having a highly paid Tech Guy on staff... without the highly paid part.

Ascent MA16
(Multimedia)

AMD Athlon™ XP Processor 1900+
QuantiSpeed™ architecture**
outperforms competitive 1.9GHz PC processors
256MB PC2100 DDRAM
80GB Ultra ATA (7200 RPM) Hard Drive
nVidia GeForce-2 32MB w/TV Out
19" (25dp) 18' Viewable Monitor
SoundBlaster LIVE! 5.1 PCI Sound Card & Cyber Acoustics CA-3770 Speakers w/Subwoofer
16x/10x/32 Max CD-R/RW & 16x Max DVD-ROM
56K PCI V.90 Winmodem
Microsoft® Windows® XP Home
7-Bay Mid-Tower Case
5/3-1' Year On-Site Warranty
$1599 #980790
Lease $53.88/Mo.

Ascent SA15

AMD Athlon™ XP Processor 1800+
QuantiSpeed™ architecture**
outperforms competitive 1.7GHz PC processors
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80GB Ultra ATA (7200 RPM) Hard Drive
ATI 32MB AGP w/TV Out
19" (25dp) 18' Viewable Monitor
PCI Wavetabled Integrated Audio w/CA-2022 Speakers
16x/10x/32 Max CD-R/RW Drive
10/100 PCI
Microsoft® Windows® XP Professional
Microsoft® Office XP Small Business
7-Bay Mid-Tower Case
Extendable 1-Year (Limited) Warranty
$1299 #980752
Lease $43.78/Mo.

Ascent SA14

AMD Athlon™ XP Processor 1700+
QuantiSpeed™ architecture**
outperforms competitive 1.7GHz PC processors
128MB PC2100 DDRAM
40GB Ultra ATA (7200 RPM) Hard Drive
ATI 32MB AGP w/TV Out
17" (25dp) 16' Viewable Monitor
PCI Wavetabled Integrated Audio w/CA-2022 Speakers
52X Max CD-ROM
10/100 PCI
Microsoft® Windows® XP Home
Microsoft® Office XP Small Business
7-Bay Mid-Tower Case
Extendable 1-Year (Limited) Warranty
$999 #980758
Lease $33.67/Mo.

Ascent D9

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PCI Wavetabled Integrated Audio w/CA-2015 Speakers
52X Max CD-ROM
10/100 PCI
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*Based on the Eadington Labs, Inc. Business Workstation 3001-4.0 benchmark: comparing an AMD Athlon™ XP processor 1900+ with QuantiSpeed™ architecture to a 1.9GHz Intel® Pentium® 4 processor. **QuantiSpeed™ architecture operates at 1.4GHz for the 1700+ and 1.6GHz for the 1900+.

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It's like having a highly paid Tech Guy on staff. (Without the highly paid part.)
Disc Masters

by Jan Ozer

The top CD-mastering applications have all the right tools.

It's human nature to always want more, and those of us mastering CDs are no exception. Most CD burners include software that provides the basic ability to create data and audio CDs. Alone, these programs are not going to satisfy anyone making lots of discs—you might want to label your CDs, use an audio editor, or apply cleanup filters to remove hiss and crackles from analog sources. You might also find you need additional programs to burn MP3 or Windows Media Audio (WMA) files to disc, depending on what came bundled with your recorder.

Here's a look at some of the best CD-mastering programs to cross our radar screen. These programs support the latest technologies used by hardware vendors to prevent buffer underruns, including Yamaha's SafeBurn, Ricoh's JustLink, and Sanyo's BURN-Proof. That means regardless of which mastering software you choose, you should no longer generate piles of ruined CD-R blanks.

CLICK 'N BURN PRO 2.0

EDITORS’ RATING 5.0

PROS: Broad feature set, solid audio editor, CD-label maker
CONS: User interface needs a face-lift; doesn't automatically fill in audio-CD track information

We like the functionality that Stomp built into Click 'N Burn Pro 2.0, but an outdated interface and several critical feature gaps put it at a disadvantage.

Our woes started during setup. We were forced to install each major module separately, for a total of five installations. And when grabbing audio-CD tracks, Click 'N Burn Pro doesn't fill in track-title and artist fields, a major hassle.
Label Like a Pro

Labeling your CD-R and CD-RW discs with a felt-tip pen degrades the hours of work that went into the data or the entertainment quality of the audio painstakingly archived to disc. To dress your disc for success, you need a printed label.

You can spend a little or you can spend a lot making labels. If your budget is in the low two figures, opt for a product such as Stomp's CD Stomper Pro (www.cdstomper.com, $39.99). The kit includes label-creation software with loads of images and templates, 50 blank CD/DVD labels, 10 jewel-case and tray-card insert sheets, and a plastic guide that applies the adhesive labels to your discs precisely. Similar products include the CD Labeling Kit from Pressit (www.pressit.com, $24.96), and the Neato CD Labeler Kit from Fellowes (www.fellowes.com, $29.99).

For a truly professional appearance, however, you'll need a inkjet printer like Primera Technology's Signature IV (www.primeratech.com, $1,495). This unit prints directly on special CD-Rs that cost about $1 each in packs of 50. The result is a disc that could pass for a mass-produced product. Trace Affex's Allegro (www.affex.com, $1,285) produces similar results, as does Oidion's DigiPrinter Universal (www.oidionusa.com, $449).

Working in the compilation window was clunky. Rather than letting you drag tracks to the desired location, you must use arrow keys to move them up and down, and type in a new directory to change data location. When you add a directory to your data CD, you can't see its contents, just the directory name followed by "**", complicating preburn quality checks. Even changing audio or data filenames was unnecessarily complicated, and the HTML help file lacks index or search capabilities.

Packet-writing and backup software from Veritas are two strengths of Click 'N Burn, as is the ability to write to up to four drives simultaneously. Two of the software's other bright spots are compromised somewhat, however. The program's audio editor is only functional, though it does feature hss-and-click removal, and the competent label maker lacks the ability to import track and other content information. For everyday audio and data compilations, Click 'N Burn Pro needs some work.

Building on PrismoD technology acquired from Veritas, Stomp plans to introduce a new package, the $99 RecordNow Max Platinum, early this year. Given the burgeoning market for sub-$1,000 DVD recorders, this new product, the first to combine traditional CD- and DVD-mastering capabilities, will definitely be worth a look.

Easy CD Creator 5 Platinum

<table>
<thead>
<tr>
<th>EDITORS' RATING</th>
<th>8.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROS:</td>
<td>Polished look/feel for mainstream users; SoundStream 2 mixes CD, WMA, MP3 files</td>
</tr>
<tr>
<td>CONS:</td>
<td>CD copy function comparatively weak; obtuse Video CD program; cryptic video editor</td>
</tr>
</tbody>
</table>

Roxio's $99.95 Easy CD Creator 5 Platinum is a polished product that handles most mainstream data and audio tasks with aplomb. The only reasons to look elsewhere are to get a lower price, superior Windows integration (SimpliCD), or more advanced CD-copy and audio functions (Nero).

New in version 5 is an application launcher that makes it simple to pick the right applet for the job. Roxio also added SoundStream, which rips audio-CD tracks into MP3, WMA, or WAV format, and accepts and burns the same formats onto an audio CD.

In addition, the Spin Doctor applet enhances analog recordings with noise reduction and track splitting, while a normalizer feature adjusts tracks to the same volume—essential for audio CDs compiled from multiple sources. We found Roxio's Music CD Project adept at creating audio-CD compilations, and appreciated that music track, title, and artist information automatically flows into Roxio's competent labeling utility.

On the data front, version 5 retains Easy CD Creator's look and feel; you can drag files from a Windows Explorer-like window on top to a compilation window below. Nothing could be easier.

Mastering on the Mac

Macintosh shoppers will find three primary CD-mastering entries on the market. The clear leader in the Apple domain is Roxio's Toast 5 Titanium (www.roxio.com, $89.95), a good general-purpose program for audio and data CDs with niceties such as a label- and liner-creation program. A slightly less expensive alternative is Charismac Engineering's Discirobe 4.5 (www.charismac.com, $74.96). In contrast, Roxio's high-end Jam ($199) targets audio mavens who need a stand-alone audio editor and advanced features such as the ability to insert crossfades between CD tracks.
CD-MASTERING SOFTWARE

NTI CD-MAKER 2000
PROFESSIONAL EDITION 5.0

EDITORS' RATING 5.0
PROS: Logical workflow
CONS: Doesn’t import audio-CD track information; user interface needs work; no stand-alone audio editor

A head Software’s Nero Burning ROM 5.5 is a techie tool that provides advanced features such as a programming API, hybrid Mac/Windows disc support, and the ability to record simultaneously to up to 32 CD recorders using optional software. Nero’s audio editor is particularly impressive, as is the $49 price for the software’s downloadable version.

Nero is wizard-driven, and most functions share a similar interface, a welcome change from the multiple-applets approach of other products. We never quite felt comfortable with Nero’s interface, though, and we frequently adjusted window size and location while working through projects.

Nero’s WAV/MP3 editor was among the best in this roundup, with hiss and noise reduction for analog recordings. You do have to pay $19 for unlimited MP3 encoding, however. Other caveats include having to spawn a separate player to listen to your own source files, and a CD-label and jewel-case art program that’s inferior to Easy CD Creator’s.

In the video arena, Nero handles both Video CD and the MPEG-2 based Super Video CD with reasonably straightforward menu creation and MPEG-1/MPEG-2 encoding. (MPEG-2 encoding requires an optional $16 plug-in.) Nero also offers features that simplify the archiving of games and other hard-to-copy discs, and the program allows for virus checking before burns.

**FEATURE COMPARISON**

<table>
<thead>
<tr>
<th>Feature Comparison</th>
<th>Click 'N Burn Pro 2.0</th>
<th>Easy CD Creator 5 Platinum</th>
<th>Nero Burning ROM 5.5</th>
<th>NTI CD-Maker 2000 Professional Edition 5.0</th>
<th>SimpliCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supports Buffer-Underrun Protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Supported Audio-Input Formats</td>
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<td>WAV, MP3, WMA</td>
<td>WAV, MP3, VOF, AIF</td>
<td>WAV, MP3</td>
<td>WAV, MP3, WMA</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Bootable CD</td>
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<td>Yes</td>
<td>Yes</td>
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<td>CD Audio</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MP3 CD (With *.m3u)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>CD-Extra/Enhanced CD</td>
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<td>Yes</td>
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<td>Mixed Mode</td>
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<td>HFS (Mac Support)</td>
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<tr>
<td>Video CD</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Super Video CD</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>OTHER FEATURES</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CD-Text Support</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>Multiple-Burner Support</td>
<td>Up to four</td>
<td>No</td>
<td>Two (updates available for up to 32)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Packet-Writing Software</td>
<td>Veritas Direct Letter Access</td>
<td>DirectCD</td>
<td>IndCD</td>
<td>FileCD</td>
<td>SimpliCD ReWrite</td>
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<tr>
<td>Sound Editor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Normalize</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Analog Cleanup (Hiss and Click)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Allows Disc-to-Disc Copying</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Label Creator</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Backup to CD-R</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Extras Included</td>
<td>Five DiscSavers (thin CD jewel cases)</td>
<td>Labels</td>
<td>Presslist labels and applicator</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
Extra Help for XP?

Windows XP offers some CD-burning functionality, but most users will want to opt for a third-party program regardless. Here's why.

On the audio front, Windows Media Player, available for Windows 95 and later, already includes CD-recording capabilities, with several notable limitations. First, Media Player has to lay out all tracks before burning, so you'll need 650MB of free hard drive space or more. Most traditional CD recorders do not require this.

Also lacking is the ability to easily archive an audio CD. With Media Player, you have to convert all the tracks to WMA, create a playlist, and burn from there. Furthermore, niceties such as a sophisticated audio editor, hss-and-click removal, track effects like fade-in and fade-out, and a CD labeler are missing.

For data, Windows XP can burn directly to your CD-R, but you'll have to wait as it stages all files on the hard drive before the burn, and your system will have to accommodate the associated storage overhead. In contrast, virtually all mainstream CD-R programs read the files and write on the fly, saving disk space.

On the plus side, XP's controls are simple and well-integrated with Windows. And XP supports multisession discs, so you can back up your files incrementally.

However, support for multisession discs is not as helpful as drive-letter-access capabilities, like those in Roxio's DirectCD. DirectCD can write incrementally to a CD-R or CD-RW disc with minimal overhead for each write. Each time you write a new session in XP, the disc consumes about 20MB of space for overhead. Thus, for incremental backups, you're better off with a third-party program.

In addition, XP doesn't support any of the advanced disc formats such as hybrid, bootable, Video CD or Super Video CD, so you'll have to look elsewhere for these capabilities as well.

<PRODUCT SUMMARY>

| FEATURES | CD-MASTERING SOFTWARE |

<table>
<thead>
<tr>
<th>EDITORS' RATING</th>
<th>5.0</th>
<th>8.0</th>
<th>7.0</th>
<th>5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT</td>
<td>Click 'N Burn Pro 2.0</td>
<td>Easy CD Creator 5 Platinum</td>
<td>Nero Burning ROM 5.5</td>
<td>NTI CD-Maker 2000 Professional Edition 5.0</td>
</tr>
<tr>
<td>REQUIRES</td>
<td>166MHz Pentium or faster; 32MB RAM (64MB recommended); 50MB hard drive space; Windows 95, 98 SE, 2000, Me, NT, or XP</td>
<td>200MHz or faster processor; 32MB RAM (64MB recommended); 200MB hard drive space; Windows 95, 98, Me, 2000, NT 4, or XP</td>
<td>Windows 95, 98, Me, 2000, NT 4, or XP</td>
<td>266MHz Pentium II processor or faster; 32MB RAM (64MB recommended); 32MB hard drive space; Windows 95 and 98; 64MB RAM for Windows 2000, Me, NT, and XP; 200MB hard drive space</td>
</tr>
<tr>
<td>DIRECT PRICE</td>
<td>$49.95</td>
<td>$99.95</td>
<td>$69 (boxed); $49 (download)</td>
<td>$49.99</td>
</tr>
</tbody>
</table>

If you're working with Windows file folders, you'll feel right at home burning data CDs with Oak Technology's SimplicID, which offers extraordinary Windows integration. Its audio and video tools don't measure up to those offered by other applications in this roundup, however.

SimplicID appears as a folder on your Windows desktop, into which you can drag and drop files. You control CD-writing functions with six special icons installed on the menu bar. You can even click the folders button, spawning the Explorer-like file selector on the left to drag files into the compilation window.

Double-click on a folder on the left, and you convert to a standard Windows folder without the burn controls, which is initially jarring. Though you can return to the SimplicID window by pressing "back," many will prefer a fixed application.

You create audio, video, and still-image slide shows in Oak's Digital Media Recorder, a small media-player-style application with a claustrophobic working area. Basics like CDDB support and MP3 and WMA encoding are all here, but the program lacks a separate WAV editor and can't create Video CD menus. (We did like its ability to create Video CD 2.0-compliant slide shows.) Consider also the lack of a CD-label maker, and the competition, relegating this contender to the shadows—unless seamless Windows integration is your absolute top priority.

Burning Bright

Any of these five programs can handle elementary CD recording—but then, so can the basic bundles that ship with the drives themselves. Users willing to pay for a cushy ride should opt for Roxio's Easy CD Creator 5 Platinum, while advanced users should head toward Nero Burning ROM 5.5.
The file-sharing heirs of Napster are about to square off against new for-pay services backed by the major record labels. Digital music has survived, but at a cost.
J eremiah Greenblatt is a recovering Napster addict. He first started using the online music-sharing service at the beginning of 2001 and was instantly hooked. "I'd heard about it for a long time, but never bothered to try the software until it was almost too late," recalls Greenblatt, a theatrical carpenter who lives in Brooklyn. He tried to make up for lost time. "I was downloading MP3 files as fast as my Internet connection could carry them."

But Greenblatt didn't have much time to indulge his habit. Shortly after he began using the service, Napster began removing many copyrighted songs from its vast directory in response to a court ruling. Then, in July, it shut down the network altogether, announcing plans to return as a subscription service.

Greenblatt was bereft, but not without options. "There are plenty of Napster-like programs out there," he says. But he hasn't used them yet. "I haven't even gotten around to listening to everything I downloaded," he admits.

LEGAL Fallout

The past year has been turbulent for online-music devotees. Just as millions were learning to turn to the Internet as a primary source of downloadable music, a series of legal actions on the part of the recording industry changed everything. The repercussions are still being felt, as companies scramble to form alliances and strategies that will enable consumers to purchase music online.

In 2000, the explosive popularity of Napster (www.napster.com) sparked a lawsuit by the Recording Industry Association of America (RIAA). The suit charged that a large percentage of the MP3 files swapped by Napster users were copyrighted material owned by RIAA members, and their trading constituted copyright infringement. The RIAA also targeted MP3.com (www.mp3.com), whose MyMP3 service offers users the ability to listen, via MP3.com's servers, to tracks on albums they already own. MP3.com countersued, alleging unfair RIAA business practices.

Other suits, countersuits, settlements, and court decisions followed throughout 2000 and 2001; some have yet to be settled. The result so far has been that Napster, in its original free file-sharing form, ceased to exist. MP3.com scaled back its services, and many smaller music-downloading sites went out of business or were absorbed by rivals. Despite all that, another result has been the proliferation of alternative peer-to-peer file-sharing services that do pretty much what Napster did.

At the same time, the music industry realized that downloadable music is here to stay. Publishers and record companies tried to figure out how to profit from downloadable digital music, and also tried to fight illegal file swapping. Until recently, the industry's response to the situation was "a classic case of supply fighting its own demand," says Derrick Oien, president of MP3.com.
This is about to change. Most of the major players in the music arena have aligned themselves with one of two new services, Pressplay and MusicNet, both expected to be up and running by the time you read this. Pressplay (www.pressplay.com) is a joint venture of Sony Music and Vivendi Universal.

**Around the Virtual Dial**

The trend with digital music is to pick and choose your own music mix, track by track. But if you're a radio fan who enjoys listening to what a talented DJ has in store for you, you're also in luck. The Internet offers an abundance of live radio-style broadcasts that can be enjoyed at any hour. And many of them are free.

An Internet "radio station" is simply a real-time audio stream, usually in RealAudio, Windows Media Audio, or MP3 format. To listen, you simply need freely downloadable audio-player software that's compatible with the format. A streamed CD track starts playing at the beginning of the song, but when you click on a Web link to a real-time stream, it starts playing in the middle of the broadcast. It's just like tuning in a station on a real-world radio.

Many stations have a low-fi version of the feed for those with slower connections. You'll appreciate the experience more with a fast connection, though, especially if you plan to run the audio player in the background while performing other Internet-related tasks on your PC.

You can find thousands of online stations; some are affiliated with AM or FM broadcast stations, others are Net-only. You'll find stations that play music of every conceivable genre, and others with news, sports, weather, humor, commentary, and spoken-word performance. Some good starting points for finding stations that suit your taste are the Internet Radio List (www.internetradiolist.com), Yahoo Radio (radio.yahoo.com), VirtualTuner (www.virtualtuner.com), and Radio-Locator (www.radiolocator.com).

**MusicNet**

(MusicNet has the backing of EMI Group, Bertelsmann, and AOL Time Warner, and is using technology from RealNetworks. Napster will be launching a new paid subscription service in conjunction with MusicNet, while MP3.com has inked a deal with Pressplay.

German media giant Bertelsmann is also developing its own all-encompassing music brand, BeMusic, which will unite three of the company's properties: online music retailer CDNow (www.cdnow.com), digital music "locker" creator Myplay (www.myplay.com), and the venerable mail-order record club BMG Direct (www.bmgmusicservice.com). Bertelsmann also licensed Napster technology to power some aspects of BeMusic's incipient online presence.

**DIGITAL DELIVERY**

Different companies have taken various approaches to selling digital music and delivering it from their servers to your ears. Streaming files involves different technology and delivery models than providing files for download.

It's important to understand the distinction between streaming and downloading an audio track. Streaming is the standard distribution method for Internet radio. When you "stream" a track, you're essentially listening to a song directly over the Internet; you can't then take the song and copy it or burn it onto a CD.

When you download a track, a file in MP3 or another format is transferred to your computer, where you can do what you want with it—although files in some formats, such as Windows Media Audio (WMA), have copyright restrictions built in.

Most of today's digital-music sites provide music downloads, and charge per downloaded song or album. CDNow (www.cdnow.com) takes this approach, charging between 99 cents and $3.99 per track.

SonicNet (www.sonicnet.com) is another pay-per-download site, as are the digital-music sites for MTV (www.riopoint.com/MTV) and VH1 (www.riopoint.com/VH1). All three are powered by server technology from RioPort, so they share a similar interface.

RioPort supplies files in various formats, with accompanying restrictions, depending on which label provided the content. For example, WMA content from the EMI catalog can be burned to CD twice, while WMA files provided by Warner cannot be burned to CD at all.

Liquid Audio is another format with rights protection built in. The online store at Liquid.com (www.liquid.com) has an extensive catalog of downloads, which require the proprietary Liquid Player software to play. You can also use this software to burn downloaded tracks to CD, although only certain CD-R drives are supported.

While downloading an album may seem appealing, the cost is about the same as buying the same album on CD. Consequently, the usage restrictions might make you think twice.

One advantage, of course, is that you can listen to your new music immediately. MP3.com's Instant Listening feature lets you purchase CDs and immediately listen to their tracks. When you order certain albums from MP3.com or its partners, such as Hollywood.com (www.hollywood.com), you can add tracks to your MyMP3 account and listen to them before the CD arrives. Amazon.com (www.amazon.com) offers similar functionality with some albums, placing their contents into your account's Digital Library (www.amazon.com/mylibrary).

MP3.com also has a NetCD purchase option for some CDs. The NetCD version of an album is significantly less expensive than the physical CD, and buying it transfers the tracks into your account, from which you can play or download them. Due to legal issues, the number of Instant Listening-enabled albums and NetCD albums is limited, but this should start to change with the launch of Pressplay.

Pressplay and MusicNet are expected to bring a subscription-based model to the forefront of digital-music purchasing. One site that already operates on this subscription model is MusicNet.
model is EMusic.com (www.emusic.com). Once you pay a monthly fee—$14.99 a month for three months, $9.99 a month if you sign up for the whole year—you can download any number of tracks or albums from the site’s extensive catalog. (A free 30-day trial is available, during which you can download up to 100 tracks.)

A site called LiquidCD (www.liquidcd.com) uses an innovative music-purchasing process that circumvents both the legal problems of downloadable MP3s and the logistical hassles of live streaming. Browsing the company’s catalog, you can add tracks to your shopping cart for 99 cents, or an entire album for $9.99. When your cart contains enough music to fill a CD, LiquidCD’s proprietary software lets you burn the songs directly onto a disc in your CD burner. LiquidCD currently offers a small roster of rather obscure artists, but it’s a promising approach.

If you don’t have a CD burner, some sites still use the “build your own CD” model, burning a CD with songs you select and sending it to you. Some firms that tried this approach on a large scale, such as CustomDisc.com, are now defunct. However, some niche sites, like American Music Classics (www.americanmusicclassics.com) and Oldie.com (www.oldie.com), offer the service, albeit with a limited selection of music.

These purchasing options apply to music by major-label artists, but the Web also offers an incredible wealth of legally free downloadable music by little-known artists. You can find a huge number of free promotional singles by big-time acts. MP3.com boasts more than 1 million songs, and many of the other sites mentioned above, including CDNow and MTV.com (www.mtv.com/music/downloads), provide free downloads in addition to their for-pay fare. Listen.com (www.listen.com) offers a large, searchable database of for-pay and free songs.

COURTING MUSIC LOVERS

According to David Pakman, BeMusic’s senior vice president of corporate development and public policy, consumers’ use of Napster, MP3.com, and other services indicates a massive demand for digital music. The industry’s task is to figure out how to meet that need. “We’re racing to satisfy the consumers who have already told everyone what they want,” Pakman says.

How will these services work, where will you find them, and how large a selection of music will they offer? "We have to continue to morph our models,” says MP3.com’s Oien.

At first, Pressplay and MusicNet will have a few basic elements in common. Neither will offer a stand-alone service; you won’t go to their Web sites to get music. Rather, each will license its catalog and technology to a number of affiliates.

Several high-powered Web portals are already Pressplay affiliates, including Microsoft via its MSN Music site.

Napster is also working directly with Bertelsmann (Bertelsmann’s BMG publishing arm is a MusicNet participant) in preparation for the launch of its new for-pay subscription service. In fact, the deal between Napster and Bertelsmann, signed in October 2000, was one of the first signals of rapprochement between the recording industry and the file-swapping community.

Bertelsmann, meanwhile, is preparing its own digital-music site. CDNow and BMG Direct will remain available in their present form, Pakman says; BeMusic is expected to be "an über-Web site" providing multiple mechanisms for obtaining music.

How will you actually obtain digital music through these new services? Pressplay and MusicNet will offer both streaming audio and downloads, but the downloads will be in a format that incorporates copyright protection. Pressplay will provide WMA files, which will only be playable on the PC to which they are downloaded, so you won’t be able to copy them to another computer or an external MP3 player, or burn them to a CD.

Although the new services offer new limitations, they will provide legal access to substantial catalogs of music. The participation of the recording-industry conglomerates that control mainstream music is clearly a crucial element. Fortunately, record companies have signed nonexclusive agreements to make their catalogs available through these services. This means a particular song might be available on more than one service. Although EMI is a part owner of MusicNet, it has also licensed its catalog to Pressplay. "At some point, you’ll have cross-licensing both ways," says Oien. Still, a single service with music from all five major labels appears to be a long way off.

How will you pay for digital music through these services? Subscriptions. MusicNet and Pressplay assume that music buyers will be willing to pay for a month’s or a year’s worth of access to a wide range of music. The pricing structure will be up to the individual distribution affiliates, but $10 a month has been mentioned as a

(continued on page 140)
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BearShare puts a friendly face on the Gnutella peer-to-peer file-sharing network and makes downloading simple.

(continued from page 135)

suggested fee. For this price, a subscriber would be able to download a limited number of songs, maybe 50 or 75, in a given month.

However, your subscription might only give you a time-limited "rental" on the songs you download, instead of indefinite access. Under such a scheme, which is how Pressplay and MusicNet are expected to launch, you would only be able to listen to a given song for, say, 30 days after downloading, at which point the track would expire and become unplayable unless you pay an additional price for permanent access.

In all likelihood, the market will have the final say in determining how many such restrictions remain in place as the new services battle for subscriber dollars. "People are not going to change their consumption habits in a negative direction," notes BeMusic's Pakman. "If there are significant restrictions on your use of digital music, that's a bomb."

This explains why file-sharing networks, whose goal is to provide music files with no restrictions whatsoever, won't disappear anytime soon.

FREE AND EASY

The lawsuit against Napster, and the subsequent demise of its unlimited, peer-to-peer, free file-sharing network, did not put an end to MP3 sharing on the Internet. "The destruction of Napster only resulted in the second generation of peer-to-peer services," says MP3.com's Oien. Some of these new-wave networks are now comparable to Napster in their popularity and the amount of available music.

A peer-to-peer network is a community of users who share files on their own PCs using a common protocol. Any software application complying with a particular protocol can communicate with any other. Consequently, there can be a number of different client applications on any given network.

Many networks based on the Napster protocol are still out there, although Napster, the company, no longer provides access to them through a central database server. Aimster (www.aimster.com), which also features instant messaging, is one such Napster client.

Aimster also supports Gnutella, one of the largest and most talked-about file-sharing networks. Unlike Napster, Gnutella doesn't maintain a central repository of file information. While this hinders the speed and scope of network searches, participation can be fully anonymous, and there's no real target for potential lawsuits aside from the users themselves.

Gnutella also lets you share any digital file: MP3s, images, applications, and the like. Configuring your PC to work with the Gnutella network can be tricky, but many Gnutella software clients make the experience more user-friendly. Popular Gnutella clients include XoloX (www.xolox.nl), LimeWire (www.limewire.com), and BearShare (www.bearshare.com).

While Gnutella takes an open-source approach—and thus boasts a large number of available clients—other networks use proprietary protocols and software. The iMesh (www.imesh.com) network client, like Gnutella, allows sharing of all types of media files. Audiogalaxy (www.audiogalaxy.com), with its well-designed Audiogalaxy Satellite software, skirts legal issues by letting you download public-domain material directly but referring you to other users for copyrighted items.

But the file-sharing software that's generated the most recent excitement is from a small Dutch company and based on a technology called FastTrack (www.fasttrack.nl). The company behind FastTrack also owns KaZaA (www.kazaa.com), which lets you access the FastTrack network through both a software application, KaZaA Media Desktop, and a plug-in for the popular Winamp media player.

The popularity of the FastTrack network has grown exponentially since Napster went offline. FastTrack access has also been licensed to others. Morpheus, a program from MusicCity Networks (www.musiccity.com), features a superb interface for searching the network's many thousands of media files. Grokster (www.grokster.com) provides another compatible client.

A CHANGE IS GONNA COME

If you're interested in file swapping, you may want to grab your files while you can. As of this writing, the RIAA had filed a copyright-infringement lawsuit against FastTrack, MusicCity, and Grokster, and was preparing to take action against other file-sharing networks.

Whatever the outcome of the next round of court battles, and however the new subscription services play out, digital music distribution is an idea whose time has come. Napster pointed the way, says BeMusic's Pakman.

"Value was not the only reason it was successful," he notes. "There was huge convenience. The catalog was extremely deep. It was fast, it was fun, it had a community element to it." The recording industry is counting on these elements to attract customers, even when they have to pay for access.

Oien, whose MP3.com has already weathered many shake-ups, is hopeful, but knows more challenges lie ahead. The most pressing issue at present is publishing—finding a viable system for music publishers and copyright holders to be paid for music distributed in nontraditional ways.

"If we can get through that," Oien says, you'll find a rebirth of digital music.

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Everything you need...to succeed!
Here's how to keep your PC running even after its maker sinks.

BY RICK BROIDA

When Sue Mischel received her new computer from Quantex Microsystems, she was shocked. Not because the system finally arrived after a six-week delay, and not because it actually had the free upgrades Quantex promised her. The first thing that happened was I got a big shock from the tower," says Mischel, a 55-year-old part-time teacher. Upon inspecting the system, she discovered the cover was not secured properly. "Some loose stuff was floating around. I put everything in place, closed the tower, and so far, no more shocks.

But a shock of another kind was still to come. A few months later, one of the system's drives stopped working, and Mischel learned Quantex was out of business. Her response? "Anger and frustration that I had spent hard-earned money for a defective product and had no remedy."

Mischel's story reflects an unfortunate reality of the computer industry: Companies sometimes go out of business. Among the most notorious cases was the October 2000 shutdown of Fountain Technologies, the parent company of Quantex, CyberMax, Pionex, and Inteva Microsystems. Virtually overnight, customers were left holding the bag. Web sites went dark, phones went unanswered, and e-mail messages vanished into the ether.

What can you do if your computer becomes an orphan? Should you limit your shopping to local or big-name vendors? These are crucial questions for computer owners and shoppers alike, especially as the economy flags. Although you won't find easy remedies or rock-solid guarantees, you can sidestep unreliable companies and find support if you become a victim of one that goes bust.

CLOSING THE BARN DOOR
It's one thing to deal with a dead vendor if you've received your machine in decent working order. It's another if you've just placed an order with a company on the brink of bankruptcy, a fact that's usually impossible to ascertain.
Quality control tends to lapse during that period, which could result in the delivery of a defective system, should you receive one at all. Your order could be delayed or canceled, and you may find it difficult to get answers from the company. Worse yet, the company may have already cashed your check (never, ever pay by check) or charged your credit card, leaving you with a bum system or no system at all.

If you’ve placed an order and your machine doesn’t arrive on the promised date, don’t panic. Call the company for an explanation, write down the name of the person you speak with, and take copious notes during the conversation. It’s not uncommon for a parts shortage to delay an order. Give the company another chance to ship the system by a specific date. If it misses that one, it’s time to consider pulling the plug. Delays don’t prove that a company’s faltering, but they’re a sign it could be.

If you suspect something’s wrong or you’re out of patience, call your credit-card company to make sure you haven’t been billed for the system. Reputable companies don’t charge your card until the system ships, but a company in trouble may not wait that long. Assuming you haven’t been charged, ask the credit-card company to make a note in your records that you’re canceling an order for a computer. This could help immeasurably if the charge goes through despite your cancellation. Next, call the vendor to cancel your order, and again take detailed notes.

Indeed, your credit-card company can be an invaluable ally in dealing with PC vendors, according to Edgar Dworsky, consumer advocate and founder of Consumer World (www.consumerworld.org). If you’re within the vendor’s money-back guarantee period, but the seller has folded, Dworsky says, you may be able to make a claim under your card’s return-protection policy, if it has one. “Some cards, like American Express Optima, Platinum, and Blue, will refund the price of a purchase, up to certain dollar limits, for 90 days from the date of purchase, for any reason, if the seller will not take it back,” he says. Or if the seller isn’t around to take it back.

**ALL IS NOT LOST**
If your credit-card company doesn’t offer such protection, it’s only natural to feel angry and helpless. Stephen Boggs purchased his second Quantex PC in April 1999 after being generally pleased with his first one. When he needed help with it, he discovered the company had closed up shop. Now, he says, he’s just plain out of luck. “I don’t feel there’s anything I can do to receive any type of support or assistance.”

Fortunately, users like Boggs do have options: extended warranties, individual parts warranties, third-party vendors, support groups, user groups, and Web resources, to name a few.

The first step is to take inventory. Your PC was built with parts that came from a variety of sources, and those parts may have warranties independent of your vendor’s. Maxtor hard drives, for instance, carry a three-year warranty that Maxtor will honor directly if you’re unable to get assistance from your PC’s maker. The same goes for other major component companies, including Creative Labs and Iomega. But in some cases, PC vendors buy parts on an original equipment manufacturer (OEM) basis, and these parts don’t always carry the same warranty provisions as their retail counterparts. You’ll have to determine your coverage on a part-by-part basis. If you saved the packing slip that came with your PC, you may find it lists the names and model numbers of individual parts. If not, you can find a lot of answers in Windows’ Device Manager, accessible from the Control Panel.

Extended warranties may also offer extended protections. But these policies, sold by third-party companies such as General Electric and Philips Magnavox, often don’t kick in until the vendor’s warranty has expired, so read the fine print. Even if your parts warranties have

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**Don’t Get Burned Again**

The best way to deal with the death of a PC vendor is to avoid buying from an unhealthy vendor in the first place. Of course, unless you own a working crystal ball, it can be difficult to tell which vendors will be around and which won’t. With a little research, however, you should be able to pick a PC maker that’s solid.

First, decide what kind of PC vendor you want to patronize. Quantex victim Ron Midden is now sticking with the big guys. “The next time I buy a computer, I’ll most probably go with a more established brand, like Dell or IBM,” he says. “I will avoid companies without an extensive track record and a sound financial base.”

You may prefer to avoid name brands and deal with a local independent shop. Prices may be higher, and you probably won’t get a big software bundle or any glamorous extras, but you’ll likely deal with knowledgeable, accessible people. Nothing beats being able to haul your machine a few miles down the road for help and repairs, or to pick up the phone and reach a live person. Even if you decide not to buy from a mom-and-pop shop, it’s worth poking your head in the door to see if they can service machines built elsewhere.

Consumer advocate Edgar Dworsky is convinced the big-name companies and respected retailers represent your best bet for success. “Stick with famous brands with good service records, or local computer assemblers who are well-established in the community and who represent that business is good.”

Wherever you plan to buy, do your research. Read magazine articles that rate vendor reliability and customer satisfaction. Look for negative press on specific companies at Web sites such as ConsumerAffairs.com (www.consumeraffairs.com), Epinions (www.opinions.com), and the Better Business Bureau (www.bbb.org). Read as many reviews as possible, keeping in mind that just because a company receives glowing product reviews doesn’t mean it’s financially stable. Reviews can also reveal a machine’s roster of parts. If they’re from well-known companies such as Toshiba, Maxtor, Creative Labs, and ATI, you stand a better chance of getting under-warranty replacement parts should the vendor fold.
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expired and the company that sold you the system is deceased, you may still be able to get the system fixed for free. Many gold and platinum credit cards double the manufacturer’s warranty (up to one year), so you can file a warranty claim with the credit-card issuer.

Even some mom-and-pop repair shops may be able to help with warranties from parts manufacturers. These shops offer fast turnaround, and better still, there’s no shipping involved.

After you’ve taken inventory and double-checked your warranty situation, make the online home of the Better Business Bureau (www.bbb.org) your next stop. If you’ve gotten a truly raw deal, it’s important to notify the BBB for several reasons. First, if you’ve received a lemon or you can’t get your money back, the agency may decide to launch an investigation on your behalf. Second, the more users who contact the BBB regarding a company’s shoddy service, the worse that company’s rating will be. A poor BBB rating can keep others from becoming victims.

If you want to go a step further, contact the attorney general’s office in your state, and the state where the vendor is based.

**Problem Solving**

For many, it’s not the loss of warranty or repair services that hurts; it’s the loss of technical support. Suddenly, you have no one to turn to if something’s not working. Your first stop should be the free options. At sites such as AskMe (www.askme.com) and Protonic (www.protonic.com), volunteers offer free tech support. You may be able to find more such services by searching Google Groups (groups.google.com). If the free services can’t solve your problem, try one of the numerous third-party companies that have surfaced in the wake of vendor failures. PC Crisis Line (www.pccrisis.com) offers 24/7 phone support (800-828-4358) that’s billed via prepaid cards, either per minute or per incident.

Sometimes, seeking out other users who’ve been burned can be a comfort. One such group, QuantexVictims on Yahoo Groups (groups.yahoo.com/group/quantexvictims), has more than 100 members. That’s where exasperated users like Boggs and Misichel were able to find support and guidance after Quantex’s sudden demise. "The Quantex support group was very valuable to me," says Misichel. "We are all nice people who got duped."

These grassroots efforts are sometimes bolstered by corporate assistance. When Axis Systems shut down in January 2001, displaced production manager Arron Nelson purchased the remaining inventory and formed Integrity Computer Systems (www.integrity-pc.com). The new company not only builds PCs, but offers free and discounted replacement parts and upgrades for 70,000 Axis customers. Why did Nelson extend this courtesy? "I felt really bad for all the Axis customers when the decision was made to shut the company down," he explains.

**Even if your PC maker is extinct, you can still get assistance from extended warranties, component vendors, support and local-user groups, and myriad Web resources.**

Even Quantex customers aren’t totally without recourse—at least those who own notebooks. Parts and service are available from Media Computer Enterprises (www.portablecomputer.com). Why do notebook owners get a break? With the exception of major companies such as Gateway and IBM, most PC vendors buy notebooks from other manufacturers, then resell them under their own brand. A notebook purchased from, say, Trogon may be physically identical to a ChemBook; both were manufactured by Chicony. The good news is that just because Trogon folds, it doesn’t mean Chicony will, and you’ll still be able to get parts such as batteries, power supplies, perhaps even screen replacements. The bad news is it can be difficult to pinpoint your notebook’s original manufacturer to locate the parts.

That didn’t stop enterprising user Don Burns. After both AMS Tech and his AMS Tech laptop went south, he took matters into his own hands. “Because of my electronics-repair background, I decided to fix my broken laptop myself. So I contacted a few online support lists related to computer repair or laptop support, looking for an LCD for my AMS Tech TravelPro.” Burns not only found what he was looking for, he heard from other users. So was born Orphaned Laptops (www.orphanlaptops.com), offering limited tech support and replacement parts for, as the site says, "laptops that are not receiving any support from their OEMs.”

**Other Options**

Even if your vendor’s dead and gone, it pays to keep visiting the Web site again in the weeks and months that follow. If another company comes in to offer parts, support, or service, they’ll likely put a link on the site. Plenty of other sites offer upgrades, drivers, and hardware help. Need more memory? Visit a site like Crucial Technology (www.crucial.com) and use the Memory Selector to find exactly the right type of modules. Need help finding the latest drivers for your applications and hardware? Try the CNET Catchup.com utility (catchup.cnet.com), which finds not only software and driver updates but also security fixes. (CNET’s Networks is Computer Shopper’s parent company.) If you’re looking for drivers, try Driverzone.com (www.driverzone.com) and DriversHQ (www.drivershq.com). You can get help installing peripherals such as graphics cards and CD-RW drives at About.com (peripherals.about.com).

One of the best sources of help—and one of the longest-standing—is the computer user group. These groups exist in every state, and there may be one in your town. Members usually gather once a month, and whether you’re an absolute novice or a veteran who’s just plain stumped by a nagging problem, it pays to hit a meeting. You can find groups in your area by visiting the User Group Network (www.user-groups.net).

Given all these options, you can find an almost endless supply of aid in the form of third-party vendors, online support groups, local-area user groups, myriad Web destinations, and even your neighborhood computer store.
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Economic uncertainty and terrorist activity have left companies scrambling to reduce costs and accomplish more with less. And that has created a climate that's especially conducive to telecommuting.

Part-time telecommuters (those who work from home at least twice a week) now number 32 million, according to Cahners In-Stat Group, translating to roughly 20 percent of the U.S. workforce. By 2004, the digital-communications research firm says, 54 million workers will telecommute regularly.

Before you send some of your own staff home to work, you need a comprehensive telecommuting program that spells out considerations for hardware, security, communication methods, and technical support. By doing so, you'll improve employee satisfaction and save money. Telecommuting also helps increase employee retention and productivity, and serves as an effective recruiting tool for top talent.

Telecommuting works best for knowledge workers and those whose performance can be measured. But structuring tasks so staff can work autonomously and unsupervised is a challenge, as is ensuring they're involved in the corporate work culture. Regular teleconferences, Web conferences, and lots of written communication via e-mail or instant messaging can help telecommuters feel connected.

**DOCUMENT YOUR POLICY**

Setting up a telecommuter policy requires planning and forethought. IT managers should specify the technologies that will control access between the telecommuter and the corporate LAN, and review the policy at regular intervals to adjust for new technologies. The policy should define the methods for reporting unauthorized usage and delineate how telecommuters access proprietary company information. It should also...
specify usage guidelines for company-provided systems. Unless Quake III is mission-critical, you may want to prohibit the installation of such extracurricular applications.

Next, formally train telecommuters and have them sign a form stating they'll follow the policies or risk losing these privileges. You can never be completely sure what off-site staff members are doing, and these steps will limit your risks.

Before you allow large numbers of employees to telecommute, devise a comprehensive management strategy for remotely networked resources. Once a worker starts telecommuting, you risk losing control of that remote desktop, and put your company at risk for security breaches. Fortunately, existing technologies enable IT staff to update software and centrally manage these resources.

If you provide your telecommuters with a computer, make sure the software is properly locked down before deployment. We recommend standardizing with Windows 2000 Professional, which offers high stability and good security options. You can employ cloning and management tools such as Symantec's Norton Ghost 2002 and Altiris's Deployment Server 5.1 to roll out identically configured desktops.

You should also standardize all the offsite PCs by buying the same brand, model, and configuration, if possible. Stick with brand names and buy as much PC as you can afford.

We recommend at least 256MB of RAM, a 933MHz Pentium III processor, a 20GB hard drive, and a 17-inch CRT monitor. The Dell OptiPlex GX150 configured this way costs around $1,200 and offers rock-solid reliability, good performance, and a small footprint for those with little space.

Because space is a consideration for most telecommuters, a flat-panel monitor...
is a good alternative to a CRT. It takes up considerably less space than a CRT while offering sharper, flicker-free images. We like the affordable 15-inch Samsung SyncMaster 750V TFT ($399) for its simple installation, and the 17.4-inch ViewSonic VG175 ($944) for its pivot feature that lets you change from portrait to landscape without a reboot.

The single most important peripheral is the printer. For $100 or less you can get a good inkjet that will pump out decent text and attractive graphics. We like the $79 Canon S400 Color Bubble Jet Printer, the $99 (before $20 rebate) Epson Stylus C60, and the $49.99 HP Deskjet 630c.

The telecommuter who prints a lot of business-related materials is better off with a laser printer, however, because it delivers better text printing and lower consumables cost. Good choices include Minolta-QMS’s S229 PagePro 1100L and HP’s $799.99 LaserJet 2200dse.

If you’re willing to sacrifice quality output to save space and money, a multifunction printer may fit the bill. These devices fuse printing, faxing, scanning, and copying into a single unit. They range from $200 to $800, depending on features and quality. Consider the Lexmark Z82 Color Jetprinter ($199) and the HP Officejet g85xi All-in-One ($499.99).

**THE NET CONNECTION**

The next step is determining Internet-service availability for your remote workers. A dial-up connection is ubiquitous and relatively inexpensive, but slow. Virtual private network (VPN) applications will work over dial-up, but long waits for file downloads and the inevitable line disconnects will hobble productivity.

A better choice is DSL or cable-modem service. Both provide an average download speed in the 512kbps range, and cost about $40 per month. The drawback? Availability. Coverage is spotty outside of major metropolitan areas. Plus, financial woes have hit the DSL market, so make sure to check into the provider’s fiscal viability before you sign up.

For telecommuters out of range of cable and DSL, consider satellite services such as StarBand and DirecPC. Speeds are comparable to those of cable and DSL, averaging around 400kbps. At $55 to $70 per month, the service is expensive, and the high latency of satellite connections may wreak havoc with VPN connections. What’s more, the StarBand satellite’s acceleration software won’t work with hardware firewalls. If a telecommuter needs to share the connection among several PCs, you’ll need a software proxy server.

**SECURE VPN CONNECTIONS**

Determining how to connect the remote user to the corporate network is the next decision. Many companies now use VPN technology, which affords secure access to corporate information. VPN client software installed on the user’s desktop establishes an encrypted “tunnel” through the public Internet.

A VPN can be hardware- or software-based, maintained internally, or outsourced to a service provider that handles all user accounts and equipment, typically charging a monthly per-user or per-connection fee. The best VPN solutions are distributed ones in which policies are pushed out to managed nodes to ensure up-to-date security protection.

If the telecommuter connects via VPN, the IT department can manage and support that station as if the PC were on the LAN using tools such as PCAnywhere 10.5. With Altiris Deployment Server, for example, administrators can remotely control a desktop and send software updates or patches over the connection.

Check Point Software Technologies, the leader in the enterprise VPN market, recently released the latest version of its flagship product, VPN-1 Gateway. Check Point offers the best logging product on the market, has excellent centralized management, and delivers a breadth of additional services. But it’s expensive: A standard deployment costs upwards of $25,000 for 100 users when you factor in hardware, software, and consulting fees.

The Cisco VPN 3000 Concentrator series is another strong option. The VPN 3005 Concentrator supports 100 simultaneous users and includes excellent VPN client software that seamlessly connects to the corporate network. If resources are limited, you can use combination firewall/VPN products, such as SonicWall’s XPRS2. Its VPN client software is functional, but it lacks the centralized-management capabilities of higher-end products.

You can also opt for a software-based VPN. If your company has a Windows NT or 2000 server infrastructure, you can use built-in tools and a second network card to configure a fully functional VPN. Keep in mind that management costs will increase slightly because you’ll be responsible for maintaining not only the VPN software, but also another Windows server. And you must update your server religiously with the latest patches.

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**TODAY’S TECHNOLOGY LETS IT STAFF CENTRALLY UPDATE SOFTWARE AND MANAGE REMOTE COMPUTERS.**

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est security patches and service packs.

Finally, any software-based VPN relies not only on the hardware underneath it, but also on the underlying operating system. A crash in a mission-critical VPN means downtime and lost productivity. That said, configuring Windows 2000 Server to act as a VPN server is straightforward.

Because they're easier to deploy and maintain, managed VPNs are gaining some traction in the marketplace. Cox Business Services offers managed VPN services over cable for $85 to $250 per month per site, depending on bandwidth levels. A speedy 1.5mbps connection, for instance, costs $250 per month. Cox installs NetScreen VPN/firewall appliances and manages the devices at both the central site and telecommuter locations. The service is available only in a limited number of areas.

THE DESKTOP FIREWALL

Athough a VPN allows secure access to corporate information, it's not completely secure.

When a remote desktop is connected to the Internet, it's vulnerable to hacker attacks unless you install a firewall. Without one, a hacker can access a telecommuter PC, take over its VPN session, and gain entry to your corporate network. Remote PCs are also vulnerable to Internet-borne threats such as Trojan horses, spyware, and malicious worms. To prevent these types of attacks, you should install either a hardware or software firewall on every remote desktop.

Hardware firewalls cost from $100 to $300, depending on features and centralized-management capabilities. If you can afford a little more, get a device that provides stateful packet inspection to provide better safeguards for your network. Low-end devices deliver basic functionality, but offer no centralized-management capabilities. Though hardware-based SonicWall SOHO2 or TELE2 and WatchGuard SOHO are on the pricier side, they serve up the best protection. They also include remote-management capabilities and a VPN option that can tie you into the corporate LAN. If you’re on a tight budget, consider offerings such as the Linksys EtherFast 4-Port Cable/DSL Router BEFSR41.

An even lower-cost option is a software firewall. Several powerful software-based firewalls are free, including Zone Labs' ZoneAlarm 2.6 and Tiny Software's Personal Firewall. ZoneAlarm protects your PC with complete port blocking, and its "stealth mode" makes the PC invisible on the Internet, drastically lessening its chances of being attacked.

The free versions provide effective firewall protection for remote machines, but if you want central-management functions you'll need to purchase ZoneAlarm Pro 2.6 for $39.95 or Tiny Software's Centrally Managed Desktop Security for $50 per node. Another desktop firewall product worth looking at is Network ICE's BlackICE Defender 2.9 ($39.95), which provides centralized updating and management of BlackICE remote nodes.

The last step in preventing security hacks is ensuring remote desktops have up-to-the-minute antivirus protection. Some of the better antivirus products include Symantec's Norton AntiVirus Corporate Edition 7.6 for Small Business ($229.95 for five users) and Computer Associates' eTrust InoculateIT for Windows ($29 per node, $129 for admin node). Both reduce virus infection in downloaded files and e-mail attachments, and repair infected files in real time.

SMART PLANNING

A successful telecommuting program is a balance of education, technology, and well-thought-out policies. You'll need to invest in the right technologies and make sure your IT department is involved in the process. Also, closely examine your security processes to make sure nothing is overlooked.

A pilot program is a good way to ensure your solution works well before performing a mass deployment. Listen to your telecommuters regularly through weekly teleconferences, monthly get-togethers, and consistent written communications.

Finally, maintain realistic expectations. Be pragmatic, and don't expect that half your staff will be telecommuting immediately. You'll need to be careful in selecting the right type of worker.

Do it right, and you'll save your company money and boost employee morale—a concept that's fast becoming an oxymoron.
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The Hard Edge

By Alice Hill and Bill O'Brien

Surfing the Web Circa 1996; Loving the Big Blue Taco; and Bill Deciphers the %$#@! Windows XP License Agreement

A recent commercial for some ailing brokerage house showed a man rewinding old CNBC broadcasts from the "boom era" and crying softly as energetic newscasters cheered the NASDAQ's new 5,000-point high. Alice too began wishing she could live in the past, as dot-com after dot-com began sliding off the map and the Internet went from being a "legal wealth-creation machine" to a series of jokes, nasty cartoons, and, especially in San Francisco, a giant pink-slip-creation machine.

Then, one day, an unassuming invitation arrived in the mail. A party, to be held in an old library in Berkeley instead of some $10-martini bar south of Market Street, pointed the way back to what Alice was looking for: the Internet of olden days.

When you think about it, the Web's easy-to-update format meant that unless you kept screenshots or archives of your favorite sites, they continually morphed and changed into completely different products. There were no reruns online, no older version playing over and over again in syndication somewhere. Everything was live and updated, for better or worse. Alice's old alma mater CNET, for example, was a very different animal back in 1996, yet Alice herself had no screenshots, no URL she could visit to view the body of work she completed way back when.

(CNET Networks is Computer Shopper's parent company.)

It was at this unassuming party miles from San Francisco where Alice found the Wayback Machine.

Created by Alexa Internet, the Wayback Machine is a nearly complete archive of the Web from 1996 on. Simply type in your favorite URL, and the Wayback Machine serves up an index of pages beautifully frozen in time but preserved for an instant blast from the past.

Alice especially enjoyed looking at the original Amazon.com, which merely featured a few book titles and none of the technical one-click advances that were to come. Even Yahoo, the site that seemed to change the least, was almost spartanly simplistic in 1996. Alice was able to locate her long-lost "GameGirl" columns on CNET's old Gamecenter, as well as scores of other creative features and staples from the '90s.

Another great feature is the free Alexa Toolbar you can download and add to your browser. When you visit a Web site, the Alexa Toolbar displays the site's ranking according to its own index.

(AliceHill.com ranks a sad 1,335,588 in popularity), as well as reviews users have left about the site. (Alice liked the five-star review posted by a "Bill" in New Jersey who said her site was "Better than CNET." Wasn't that nice?)

The best thing about the Alexa Toolbar is that you can also click on the bar's Wayback Machine button to instantly launch the index page of each site's complete history. Visit eBay (rank 45), then click to see how much the current version has changed from the day it launched. Thanks to this wonderful archive of more than 100 terabytes of data, you can blast from the present to the past in a single click.

One technical word of caution: The Wayback site is as buggy as a 286 running Windows 1.0. The bugs won't damage anything on your computer, but many of the URLs will work one day and stop working the next. Alice is also not sure how this giant project is funded, so she urges everyone to make use of this great gift from beyond. If you did work on the Web that's now lost, or simply want to visit some old favorites that are no longer with us, don't forget to make some backups of your own.

Who knew the greatest lesson from the Internet age was about making backups? Almost comforting when you think about it. In many ways it's like 1996 all over again.

You can find the Wayback Machine and free Alexa Toolbar at www.archive.org.

Unfettered Access

The presence of the cherubs didn't really bother Bill. After all, February, Valentine's Day, little guys with bows and arrows—it all was part of the natural order of things. If only they weren't such techno-snobs. The first year they showed up with Internet-enabled cell phones. Then it was PDAs. This year, the Basement of Doom and Pepsi-Cola has become the meeting ground for cherubs toting Internet-enabled PDAs equipped with GPS and cell-phone modules.

"They're great," gushed one cherub. "We can download our new assignments, upload our completed assignments, browse the Internet, and hot-sync with the Cupid LAN when we're in the office, too."

"Ever worry about passing a computer virus?" asked Bill, taking a tug on a bottle of his favorite brown carbonated beverage.

"No, not at all. The Cupid LAN has a great firewall. Nothing can get through it."

"You have a firewall when you're fluttering around your desk and you hot-sync?"

"Well, no. I don't think we do."

Bill just shrugged as he blew through the straw and added his own bubbles. Unmanaged forays into a LAN are never very good for network health. It's a hot-sync time bomb. And with the number of Internet-enabled PDAs on the rise, the problem isn't going to go away on its own.

The Heart of XP Licensing Confusion

Now that Microsoft has decided to aggressively enforce its single-use license, some folk are getting upset. In fairness to Microsoft (a courtesy it doesn't often extend to us), you never really buy software—any software, not just Microsoft code. You only purchase the
right to use it. Usually, that’s a one-person, one-system license. If you want to put it on a second computer, technically you need to pay for a second license. Now you understand why people are getting upset. It’s that enforcement thing.

One of the billions of “Hard Edge” readers wrote to Bill about that very issue, and Bill responded with the above information. The reader then wrote to Microsoft for a final opinion and got this response:

“Hello and thank you for contacting us at Microsoft.com. The licensing for Microsoft Windows products is one license per computer. Therefore, to install a Windows product legally on a second computer, you must purchase a second license that comes with a separate copy of the product. Exceptions include laptops used as a person’s second computer.”

Seems a little confusing. What if you have what’s technically called a portable, but it never leaves the office? In practice, that becomes a desktop. On the other hand, what about something like IBM’s X series of computers, which are inherently transportable and, except for battery power, offer the same, if not better, features than a portable—would they be covered? What if you own three laptops for personal use?

This may all be moot. The Microsoft licensing FAQ (www.microsoft.com/USA/greaterpa/licensing/faq.asp) contains the following question and answer:

4. Can I make a second copy of my operating system software, such as Windows 98, for my home, work, or portable computer?

No. The right to make a second copy of a Microsoft software product only applies to some application products and not to operating system software.

On the surface, it would seem whoever responded to the reader’s inquiry (for all we know it could have been an automated response) was a bit confused between an application-product license and an operating-system license. It may also be Microsoft changed its policy for XP without updating its FAQ. Neither is beyond the realm of possibility when it comes to Microsoft.

This, too, may be moot. If reader response is any indication, most of you either won’t touch XP or have uninstalled it and put it away in a dark drawer because once you open the software you can’t return it. (Microsoft would like to thank you for that donation to its legal fund.) Bill (our Bill) is looking into it. Film at 11.

XP: THE AFTERMATH

Ever wonder what the most-often-seen reply from customer service is about a product that no longer works under XP? Try this:

“We regret to inform you that the <insert product name> you own does not have an updated driver for Windows XP. According to our head office, the <insert product name> will not have any further development on the XP driver due to limited resources and many <insert product name> having outdated components. Therefore, we will not be able to provide any type of technical support on the <insert product name> for usage under Windows XP.”

MAKING LEMONADE

One of the lower-level near-disasters that came about as a result of the September 11 atrocities was the loss of days and days of data, some quite critical to e-commerce. Despite backup facilities, many companies followed the old tape regimen and stored copies in the cabinet down the hall. That works fine if the hard drive goes south, but it’s hardly a solution if the cabinet—and the hall—goes with it.

When life hands you lemons, your only real choice is to modify your business plan— and your attitude. We hope that’s what we’ll be seeing in the tech sector, as companies try to plan ahead in case of future crises.

One thing is mandatory: offsite backup. We don’t mean just shipping tapes or discs to another location at the end of the day or week. Real-time offsite backup—preferably to multiple locations—is the only option for true data integrity, something extremely important for e-commerce operations.

Naturally, like any good need, it offers business opportunities to collateral-equipment suppliers and can cause the rise of additional cottage industries. Whether the transfer is cable or via satellite, someone must supply the equipment to get the data from site A to site B and C. The data must be secured along the way and, at the end of the day, the backup site must be able to offload the data into a more traditional backup format. Routers, switches, firewalls, servers, drives, and don’t forget space, the final frontier, in which to house everything—they’re all part of the equation.

If the tech sector hasn’t gotten its needed kick in the pants before then, we hope this new round of needs will jump-start it back to being productive and <gasp> profitable.

IBM’S BLUE TACO

All right, it’s not a blue taco. But you would understand Bill’s confusion if you also read the header on IBM’s Web site that proclaimed, “TS60 15.0INL LCD 15.0V BL TCO.” It’s stealth black, it’s called the Model TS60, it’s a new 15-inch LCD panel from IBM, and it’s way Mondo Cool.

Regular readers will be startled. Alice and Bill haven’t bestowed a Mondo Cool award on a product in quite a while—they’ve all been mostly mondo mediocre. But the TS60 is just too sexy to be anything but cool. It tilts, it folds, it’s supplied with Pivot Pro software, and you can hang it on your wall.

The excellent picture quality is a given—we wouldn’t have brought it up if that basic quality wasn’t there. It’s also priced low at $539 direct. That’s an amazingly low price for an IBM product.

Bill gets to hold onto it for another month, so you’ll probably hear more. It will be interesting to see what comparisons he can draw between the IBM TS60 and the multibillion-dollar SGI 1600SW display. Certainly, the essence of how he feels about SGI in general (not good at all) will creep in. But Bill has always been mostly fair. Usually.

GETTING CLOSE

Alice and Bill are just months away from celebrating their 10-year anniversary writing “The Hard Edge.” So start ironing that nice crisp ten-spot you’re going to send them, and practice up by dropping them a line to let them know what’s on your mind.

“The Hard Edge”
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hardedge@cnet.com
one of the greatest pluses of digital photography is being able to view and share images electronically. But sooner or later you may want to print your masterpieces, whether to create greeting cards, maintain photo albums, or send photos to your last remaining e-mail-challenged friends and family members. We'll show you how to generate spectacular color prints using an inexpensive photo printer and image-editing software.

Color laser and dye-sublimation printers do a decent job of creating color proofs and prints, but six-color inkjet printers—also known as photo printers—are the best choice for photographic output. They deliver better dynamic range, detail, and saturation than color lasers, and sharper output than dye-subbs. They're also the least expensive choice, particularly in terms of initial cost.

Typical inkjet printers use four colors—cyan, magenta, yellow, and black. Six-color photo printers add lighter cyan and yellow to produce a wider dynamic range of color. For this Tune-Up, we chose the Epson Stylus Photo 820. It offers extraordinary image quality on a range of media for a reasonable price ($149 direct).

1. **CHOOSE YOUR CONNECTION**

   Setting up your printer is a simple matter of following the manufacturer's instructions; they're usually clear and simple.

   Most photo printers, including the Epson Stylus Photo 820, use two cartridges: one for black, and one for the remaining five colors.

   If you're given a choice between a USB or parallel connection, and your PC has an available USB port, go with USB. It will ease installation and configuration, because you can add and remove USB peripherals on the fly. What's more, your system will automatically detect any connected USB peripherals.

2. **INSTALL THE DRIVER SOFTWARE**

   Installing the printer's driver software should require little more than inserting the disc when prompted by your installation instructions or, if you've used a USB connection, by the system itself.

   Your printer will likely come with some extra software, such as simple cataloging utilities and photo editors. If you can spare the disk space and don't mind the clutter, go ahead and explore such applications. But bear in mind that most lack the power and flexibility of a solution such as Adobe Photoshop 6.0 or its more mainstream sibling, Photoshop Elements. In short, if you've already committed to an image-editing solution, refrain from installing the printer's software bundle.
**CALIBRATE YOUR MONITOR**

Taking a few minutes to calibrate your monitor every now and then is a good idea even if you don't need full color management. (See the sidebar “Seeing Red—Blue, Yellow, and Black.”) This will help you set your display's brightness and contrast to a level appropriate for working with images in typical lighting. A package such as Photoshop Elements includes a decent color-management system called Adobe Gamma.

In Control Panel, double-click the Adobe Gamma icon. Choose the wizard and follow the onscreen instructions, accepting the default choices if you aren't sure of a correct value or answer. When you get to the screen with the gray box and slider, uncheck the View Single Gamma Only option to get separate sliders for red, green, and blue, and follow the onscreen instructions. For desired gamma, choose the Windows default of 2.20. After you click Finish, Gamma will prompt you to save the resulting profile. Accept the default name.

**Tip:** When working with Adobe Gamma's sliders, squint your eyes to better see when the inner boxes of color blend in.

**Use Adobe Gamma to match the colors you see on your display with the colors that appear in your print.**

---

**CHOOSE YOUR IMAGE FORMAT**

Most cameras store images as JPEG files, which lose quality every time you resave them. To avoid degrading image quality as you edit your images, save each image in a format such as TIFF or Photoshop's PSD as a first editing step. Both formats retain all pixel information each time you save the file. In Elements, select File > Save As and select Photoshop (*,psd,*pdd) as the format.

**Tip:** Using the above technique, you can think of your original JPEG file as a digital "negative." To be certain you never corrupt this negative file, lock it by right-clicking on its icon in Windows Explorer and selecting Properties, then Read-only.

---

**PREP FOR PRINTING**

Before you print your images, you'll probably want to do some basic image editing, a topic we covered in last December's Tune-Up ("Images in a Flash," p. 200). As a quick refresher, you'll want to crop, adjust contrast and color balance, and sharpen your images, in that order.

If you're not accustomed to thinking about image resolution and print size, specifying the size of your prints may be a challenge. Keep in mind the print will consist of a certain number of pixels (referred to as the image's size and resolution); how large the image prints depends on how closely those pixels will be spaced when printed.

To begin, select Image > Resize > Image Size. Change the resolution to a value appropriate for print by unchecking the Resample Image box to instruct Elements not to create or delete any pixel values. Then enter 240 in the Resolution field. Though not the only correct value, a resolution of about 240 is optimal for today's photo printers, despite the much higher resolution of the printers themselves.

Once you've changed the resolution, note the new image width and height shown in the middle of the Image Size dialog. These are the dimensions at which the image will print given the current image size and a resolution of 240. If these dimensions aren't what you need, change them by specifying either the height or width of the format you want (5 for width if you want a 5-by-7 print, for instance). It's likely the other dimension won't turn out to be exactly what you want. If you need a precise size, enter each dimension until you find the measurement that makes the other dimension larger (5 by 7.3 inches, for instance, rather than 4.79 by 7). Then you can trim off the extra three-tenths of an inch using either Elements or a more low-tech method, like scissors.

To trim within Elements, choose Image > Resize > Canvas Size, and specify the exact dimensions you need. Once you click OK, Elements will warn you that clipping will occur. Click OK again to finish trimming the image.

---

**SEEING RED—BLUE, YELLOW, AND BLACK**

Printers can't reproduce every color a monitor can display, but by investing some time setting up color management, you can reduce the often aggravating differences between what you see onscreen and what you get on paper. The result may be nicer-looking prints.

Photoshop Elements contains a capable color-management system based on standards developed by the International Color Consortium (ICC). To ensure that your display and printer produce roughly the same colors, your PC needs to understand your printer's color-generating characteristics, or ICC profile.

Photo printers such as the Epson Stylus Photo 820 ship with ICC profiles that install automatically with the printer's driver; most monitors do not. Professionals with critical color-matching needs often invest in expensive hardware tools that help them build accurate ICC profiles for specific monitors. For the rest of us, a software-based calibration tool such as Adobe Gamma is adequate. (See step 3.)

Once you've calibrated your monitor, enable color management within Elements by choosing Edit > Color Settings. In the Color Settings dialog box, select "Full color management—optimized for print." When you save your images in the future, use File > Save As and check ICC Profile to save the file as a color-managed image.

To complete setup of the color-management system, select File > Print Preview and click the Show More Options button at the bottom of the dialog box. Change the Output value to Color Management, and select your printer and paper type from the drop-down list within Print Space. Set Intent to Perceptual, and click OK.

For best results, you may need to disable your printer's color management. With the Stylus Photo 820, go to the Properties dialog and click the Custom button in the Mode section of the Main tab. Then click the Advanced button and choose No Color Adjustment in the Color Management section.
Now check your resolution again. If it falls between 200 and 300, leave well enough alone. If not, you'll need to resample. Click Resample Image to enter a check mark and then specify 240 as the resolution again. This forces the software to interpolate (or eliminate) pixel values to get it back to that 240 resolution while keeping it to the dimensions you specified. Now the image has the right dimensions and the right resolution.

**Tip:** When trimming your image by adjusting canvas size, use the Anchor control to specify where to trim the excess pixels.

![Image Size](image.png)

Set image resolution to about 240 pixels for printing, then adjust the image dimensions.

---

**PICK A PACK OF PHOTO PAPER**

You're finally ready to see the results of your efforts. The paper you choose will greatly affect these results. Most computer stores and shopping sites are chock-full of paper choices; to narrow it down, select paper designed for your printer's make. Manufacturers such as Canon, Epson, and HP sell a wide range of media for their printers, and using these papers—or others specifically formulated for the inks your printer uses—delivers the best results.

You can print on regular copy paper, but you won't like what you see. Colors will be flat and washed out, and the paper may warp and wrinkle. For that straight-from-the-photo-lab look, glossy paper is your best bet. But it costs more, and it often produces a higher-contrast image, meaning lighter, subtler shades may turn dark.

For Epson printers, it's hard to beat Epson's own heavyweight matte paper for cost and image quality. One of Epson's least expensive papers, heavyweight matte also produces beautiful colors; it's slightly thicker than most paper and offers excellent archival qualities.

If you want lots of 4-by-6 images and your printer has a roll feeder (the Epson Stylus Photo 785EPX has one), roll paper is a good choice. It lets you quickly print out a series of borderless 4-by-6 prints that don't require trimming, aside from cutting the series of images apart.

---

**PRINT IT**

Once you've made your paper selection, you're ready to print. To begin configuring your print job, click the Setup button, make sure your photo printer is selected, and click Properties. Be sure to choose the appropriate paper type. If you're using Epson heavyweight matte paper, for instance, select that from the Media Type pop-up menu. Selecting the wrong paper type can result in a print that bears little resemblance to what you expected.

You'll also need to choose the printer's resolution; this differs from the print resolution you set in step 5. Epson photo printers typically offer two resolutions: 1,440dpi and 2,880dpi. You'd be hard-pressed to discern any difference between the two, but the higher resolution uses much more ink, so go with 1,440. Finally, click OK to print.

Don't be surprised if setting up a printer that looks good takes a few tries. If colors aren't what you expected, double-check your media selection. Assuming your paper settings are correct, try changing your printer's color-management values, disabling color management altogether, or even enabling color management within Elements. (See the sidebar "Seeing Red—Blue, Yellow, and Black.") If tinkering with settings doesn't help, or you'd simply prefer to do it your way, try experimenting with hue/saturation/lightness levels. In Elements, choose Enhance > Color > Hue/Saturation.

**Tip:** To save money, do a test print on plain paper before you load the expensive stuff. You won't be able to tell much about colors from the plain-paper version—the premium-paper prints will look much different—but you'll at least be able to catch any sizing problems.

---

**INK SPOTS**

Whether you want to research printers, learn more about color management, or simply order more ink or paper, plenty of Web sites are ready to oblige. CNET.com ([www.cnet.com](http://www.cnet.com)) and CNET Shopper ([www.shopper.com](http://www.shopper.com)) are good places to to research printers and check prices. (CNET Networks is Computer Shopper's parent company.)


For how-to information on printing specifically with Epson photo and inkjet models, try the DigitalDarkroom@ Singapore ([come.to/digitaldarkroom](http://come.to/digitaldarkroom)): you may have to sift through some dated information, though. Computer Darkroom ([www.computer-darkroom.co.uk](http://www.computer-darkroom.co.uk)) offers lots of information on printing and image editing, mostly with Adobe Photoshop.

Good starting points for color-management information include Adobe's pages on ICC color management ([www.adobe.com/print/prodzone/colormgmt.html](http://www.adobe.com/print/prodzone/colormgmt.html)), Apple's ColorSync pages ([www.apple.com/colorsync](http://www.apple.com/colorsync)), and The Digital Dog, which includes color-management tips ([www.digitaldog.net/tips.html](http://www.digitaldog.net/tips.html)).

In the market for ink and media? For everything from paper to custom four-color and archival ink sets, try MIS Associates Inkjet Supplies ([www.inksupply.com](http://www.inksupply.com)), Inkjetmall.com ([www.inkjetmall.com](http://www.inkjetmall.com)), and Global Inkjet ([www.global-inkjet.com](http://www.global-inkjet.com)).

Printer manufacturers' Web sites are also a useful resource, and you can buy ink cartridges and media for your printer through their online stores.
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To contact us directly, please email channelsales@cnet.com or call 877-276-5560.
THUMBTHING’S MISSING

Dear Alfred:
Is there any software that can enlarge thumbnail images without losing the clarity?

George Smith

In the movies, you often see some technician magnify a pixelated image and miraculously enhance it to reveal a license-plate number or other critical piece of information. In the real world, there’s no way to create information where none exists. When you reduce an image to a thumbnail, you throw away information in the process. Imagine you’ve reduced a photo to a single block of color. No matter how you enlarge that block, you’re never going to recover the original image. A thumbnail contains less information than the original, so it loads faster and takes up less screen real estate. The trade-off for smaller file size is lost information.

CRYPTIC MESSAGES

Dear Alfred:
How can I find out what Windows error messages mean in plain English?

Eric Quiles

Even if you don’t believe in the supernatural, it often seems you need a medium to understand Windows error messages. All those hexadecimal values and the arcane syntax imply there’s valuable information to be had, if only you knew how to divine its significance.

Even if you could, it may not help you diagnose the problem. In my experience, many error messages are unrelated to the cause. A problem with your graphics adapter’s driver, for instance, may cause an error in Windows Explorer, but the error message won’t indicate your graphics adapter is involved.

I like to search for information based on the text of the message and hope I can find some insight into the root cause. One of the best sources of such information is the Knowledge Base on Microsoft’s support site (search.support.microsoft.com/kb/c.asp). Search for the error message, and you’re likely to retrieve some good information on its cause and how to troubleshoot the problem.

If this fails to point to a solution, try the Web, using a good search engine such as Google (www.google.com). You may find a post from someone who’s had a similar problem.

NOT-SO-PHAT FLOPPY

Dear Alfred:
I’ve been shopping for a new motherboard, and I’m finding that some onboard floppy controllers support both 1.44MB and 2.88MB floppy drives. I’ve never seen a 2.88MB floppy disk. Who makes them, and where can I get one?

Joe Plett

The 2.88MB floppy is a dead branch of the storage-evolution tree. Toshiba developed the technology in the late ‘80s; Sony also made the drives. Dubbed extra-high density (EHD), the drives had twice the data density of standard 1.44MB high-density drives.

As hard drive capacities quickly out-stripped floppies as practical backup media, even doubling the floppy’s capacity couldn’t save them. As a result, EHD drives never caught on, nor did Imation’s SuperDisk, with its 120MB capacity, for the same reason.

Today’s drive sizes make even 250MB backup media impractical. It would take 80 of Imomega’s 250MB Zip disks to back up a full 20GB hard drive. And because CD-R and CD-RW discs, at 650MB, aren’t much larger, it seems the only practical large-capacity formats are DVD-R, DVD-RAM, and streaming tape.

So the 2.88MB drive is not only gone, but probably best forgotten.

WHY FRY THE POWER SUPPLY?

Dear Alfred:
Twice in the past five months, my friend’s computer has required a new power supply. I checked out the second unit after it failed, and discovered an internal fuse had blown. My theory is that voltage swings in her electrical service are causing the fuse to give out. How can I find out if this is the problem?

Matt Bucko

Unless lightbulbs are constantly burning out in your friend’s house, I suspect over-voltage is not the problem. One easy way to check would be to get a power strip with surge protection and a circuit breaker. If the problem stops, or if the breaker keeps tripping, there may indeed be a power problem.

But in the absence of such evidence, I’m more inclined to suspect an intermittent short somewhere in the computer itself. Check to see that insulated standoffs are used to mount the motherboard to the case. Also make sure the motherboard isn’t bending and making contact with the bottom of the case. If it is, try placing a sheet of thin cardboard between the motherboard and the case to act as an electrical insulator.

GRAINY GRAPHICS

Dear Alfred:
My system crashed, and I used my rescue disks to reboot. I’ve reinstalled Windows 98, but now my graphics are grainy and use few colors, and my wallpaper is unrecognizable. Please tell me this is just a setting problem and that I haven’t blown out some hardware.

Kathy Jennings
The good news is you probably haven't damaged any hardware. You probably just need to change some settings to get things back to where they should be.

Right-click on any open part of your desktop and select Properties. Under the Settings tab, make sure your display and graphics adapter are listed correctly on the Display line. If they are, simply increase the Colors and Screen Area to the desired settings. Because higher color depths can affect display performance, I don't recommend you use more colors than you need; 16-bit color should be sufficient for most users.

If either your graphics adapter or display is not listed correctly, select the Advanced button at the bottom of the window and use the Change button under the Adapter and Monitor tabs to configure your system to use the right drivers for your hardware. You should then be able to change the color and resolution.

THE ABCs OF REARRANGING FAVORITES

Dear Alfred:

My Favorites list in Internet Explorer isn't in alphabetical order. Dragging the items around to put them in the right place takes a long time. Is there an easier way?

Jim Holihan

With Microsoft Internet Explorer 5 and later, you can do this with a few mouse clicks. Select Favorites from the top menu, and right-click on any item. Choose the Sort by Name option in the pop-up menu. This technique also works with the Start menu and Documents list in Windows 98 Second Edition or later.

If you have Internet Explorer 4.x, you’ll need to edit the Registry to alphabetize your Favorites list. Use REGEDIT or any other Registry editor to find HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\MenuOrder\Favorites\Menu. Then find the value labeled Order and delete that item. Be very careful when using REGEDIT, because it has no undo feature. All changes take place immediately without a separate save step.

Also, if you want a certain item to appear before others despite its spelling, rename it with a punctuation character that appears at the start of the name. By using the tilde (~), you can make "Computer Cures" the first item on your Favorites list, ahead of "Alphabet Sites" or other entries.

GETTING IDES TO MARCH

Dear Alfred:

My computer won’t recognize my internal Zip drive. When I plug in the IDE cable, the system won’t boot up at all. What could be wrong?

Shawn McDonald

If there is another device on the same IDE cable, make sure one device is configured as master, the other as slave. If the master/slave settings are correct, or if the Zip drive is the only device on the cable, then the most likely cause of the problem is that the ribbon data cable isn’t connected properly. If you look closely, you’ll see that one edge of the cable is colored, usually red or blue. This colored edge marks the part of the cable that should be connected to pin 1 on the drive and on the IDE interface, which may be on the motherboard or on a separate expansion card.

Look for a silk-screened "1" near the connector on the motherboard or expansion card. Make sure the colored edge of the cable is plugged into that end of the connector. On the drive, make sure the colored edge of the cable lines up with the pin 1 side of the 40-pin interface.

If this doesn’t resolve the problem, try using a different IDE cable. Check for bent pins on the connectors at either end. If all else fails, the drive itself may be defective, and you may need to repair or replace it.

tip of the month

TEACH CD-R FILES TO WRITE

CD-Rs are a great way to back up files. They’re inexpensive—sometimes less than 50 cents apiece—and almost any CD drive can read them. But beware:

There’s a hidden problem that may catch some users off guard. This month’s tipster shows how to get around it.

Dear Alfred:

I just discovered that files backed up to CD-R and subsequently saved back to the hard drive become read-only. I found out the hard way when I saved a Web page to CD-R, copied it to my hard drive, and tried to open it in FrontPage.

Fortunately, there’s an easy fix. Open Windows Explorer and right-click on the filename. Select Properties, and uncheck the Read-only checkbox in the Attributes section.

You can also change the attribute for many files simultaneously. Open a DOS window, and switch to the root directory of your drive.

Use the following command to reset all read-only files on the disk: ATTRIB -r /s /a.

Donald Reynolds

I remember the first time I was bitten by this sneaky problem. It took a long time to figure out what caused it.

You can also see your files’ attributes in Windows Explorer. In Windows 98, select View, then Details. The rightmost column will show initials for any attributes set for that file. “R” indicates read-only status. “H” indicates hidden. “S” means the file is a system file, and “A” means the archive bit is set. Note these attributes can apply to folders as well as files.

Send us your favorite tip, and you could receive a tipster’s prize package, including a coveted “Computer Cures” T-shirt (one size fits all), plus some other items you can’t get anywhere else.

“Alfred Poor’s Computer Cures”

Computer Shopper

28 E, 28th St., 10th Fl.

New York, NY 10016-7922

computer_cures@cnet.com

Please include your name. Due to the number of letters we receive, we cannot provide personal replies, nor return any enclosures.
Many reasons to log onto the Internet's most advanced electronics site...

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- Real-time, on-line order tracking.
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- On-line expert advice.
- Comprehensive information on every product...

- Check out these and thousands of other great products when you log on at www.etronics.com. And if you decide to purchase, we'll show our appreciation by giving you a free gift ($29.99 value) with every order over $50. To receive your free gift, enter code #CSMAG at checkout.

**TERAPIN STAND-ALONE CD VIDEO RECORDER**
Audio and Video CD Recorder
With the Terapin CD Audio/Video Recorder you can burn 74 minutes of full-motion video with audio onto a blank CD-R or CD-RW disc - where it can be played back on any CD or DVD player and CD or DVD-equipped computers. Now you can easily transfer all your videos from a camcorder or VCR onto a CD - with all the benefits.

**JVC HR-DV52 MINI DV/S-VHS DUAL DECK**
Mini DV/S-VHS Dual Deck
A double deck, the HR-DV52 incorporates a Mini DV VCR and an S-VHS VCR, allowing direct playback of S-VHS or Mini DV Tapes Direct dubbing from S-VHS to Mini DV and vice versa, or connect directly to your DV camcorder for DV-to-DV editing.

**CANON POWERSHOT G2**
4.0 Megapixel 6x optical 2x Digital Advanced Camera
The design of the Canon PowerShot G2 is based on the popular PowerShot G1, with an elegant champagne metallic coverplate and an enlarged hand grip for better ergonomics. The Canon G2 has many features in common with its predecessor, including a superbly sharp high-speed 7.21mm f/2.0-2.5 zoom lens (equivalent to 34-102mm in the 35mm format), a Vari-Angle LCD viewfinder.

**PANASONIC DVD-RP56**
DVD Video, CD Video and CD Audio Progressive Player
Super-high performance audio playback from a new DVD Audio Discs, a new world standard for home audio reproduction. Also plays back DVD Video Discs, Video CDs and Compact Discs for compatibility with a wide variety of formats.

**SANYO DCR-VX2000**
3-CCD DV Camcorder
State-of-the-art CCDs for higher resolution images, a high-quality 21" plasma LCD screen for instant playback and still image capture either direct to Memory Stick media or from a single frame of video footage.

**SONY DCR-PX100**
DV Camcorder
A High-Level AF Camera
The CameraIEW 5 SLR packs high-level AF technology, powerful film drive, fast shutter speed, and a multitude of creative features into the smallest and lightest camera body. 7 point autofocus system with dual-cross crystal sensor. Autofocus point selection can be controlled by user. Metal lens mount.

**NIKON N80**
SLR Camera
Efficient and logical controls include responsive Nikon Dual Command Dials for optimum control. Full-time AF operation with every AF Nikkor - Nikon’s exclusive Dynamic AF technology makes where the subject is.

**MINOLTA MAXXUM 5**
A High-Level AF Camera
The Maxxum 5 SLR packs high-level AF technology, powerful film drive, fast shutter speed, and a multitude of creative features into the smallest and lightest camera body. 7 point autofocus system with dual-cross crystal sensor. Autofocus point selection can be controlled by user. Metal lens mount.

**NIKON N85 KIT**
With Nikon 28-50mm Lens
USA-Warranty Multi! The N85 is ideal for people who want to take a step up from point and shoot cameras and at a surprisingly affordable price. Weighing only 1.9 lbs. the N85 is one of the lightest and smallest 35mm SLRs anywhere.

**SONY CYBERSHOT DSC-F707**
5.2 Megapixel 5x Optical Digital Camera
The Sony CyberShot DSC-F707 combines a 5.2 megapixel CCD (5.2MP effective), a super-resolution Carl Zeiss Vario-Sonnar lens, 60x zoom, and a large LCD monitor for improved focus and exposure metering. Multi-custom metering and TTL pre-shutter exposure control. Intelligent flash with automatic level and selectable recycle reduction.

**SONY DAV-D550**
DVD Dream Home Theater System
450 watts total system power in 5.1 speaker system 5.1-channel, DVD/DV changer, CD/R/WY compatible, SACD compatible, multi-channel playback. In addition to having a built-in Dolby Digital™, DTS® & Dolby Pro Logic® encoding. Exclusive Digital Cinema Sound™ technology recreates the legendary sound of famous Hollywood studios. Headphone Theater mode simulates surround sound effect.

**NIKON COOLPIX 995 Digital Still Camera**
Features 3.3 Megapixel CCD with true (non-interpolated) image resolution of 2048x1536class for incredible image quality. Super-fast 4x Optical zoom Nikkor lens with 38-152mm coverage. 35mm Equalized for sharp, color images plus 4x digital zoom feature. 26mm Element Matrix Metering and White Balance for outstanding exposure and color balance in every image.

**CANON EOS ELAN 7E KIT**
SLR Camera With 28-80mm USM
The latest camera to feature Canon’s exclusive Eye Controlled Focus. Quite simply, Eye Control is the fastest, easiest method of selecting a focus point. Power yet fast and user friendly, the EOS ELAN 7E satisfies the needs of photographers with a wide range of skill levels.

**KENWOOD HTB-504**
Home Theater Audio System
Removable 64 Megabit Memory Stick Media provides up to 120 minutes of music enjoyment and can also be used to transfer and store voice, image, and data files. Transfer Internet Downloads and Recordings from your CD to and from PC via USB connection for high-speed data transfer.

**CANON REBEL 2000 KIT**
SLR Camera With Canon 28-80mmF/3.5-5.6 EF
Large APS-C sized 35mm SLR Camera with high-speed 70 zoom wide area autofocus system and focusing algorithm that increases AF speed. New exterior design.

**PENTAX PX30 QD**
SLR Camera Kit w/35-50mm Lens and Case
When photo opportunities arise, give them your best shot. The 2X-30 from Pentax. It lets you shoot at the spur of the moment with automatic ease, or express yourself creatively through manual control - whichever style matches your mood.
A Solid CD-RW Drive For Under Two Bills

Speeds seem to increase overnight when it comes to CD-RW drives. We found some good ones, both internal and external, for less than $200.

BY ALICE HILL

REWRITABLE CD-ROM DRIVES are a great way to burn your own custom music CDs, back up your data, and free your hard drive of large files such as digital pictures. Many new PCs ship with CD-RW drives, but most older systems are sadly missing out.

Janet and Steve Tinkler’s first PC was a good deal, but they skipped buying a lot of extras. “We had no idea if we’d need a scanner or a Webcam, so we kept things pretty basic,” Janet recalls. Now, a year later, they’ve decided being able to create custom CDs from their downloaded music collection, as well as “greatest hits” CDs from their own music library, would be a great new use for their PC.

The couple was very clear about two things. First, although both work as engineers for Motorola, they wanted a CD-RW that would be brain-dead simple to install. A CD-RW/drive for under $200 with easy-to-use software was in line with the couple’s needs. As Janet put it, “We just want to have fun making a few CDs for our commutes to work.”

Second, Steve wants to use the drive to make backups of their financial files, digital photos, and important programs. “I hate making backups, so if this drive can make that easier, I’d like to include that feature in our requirements list,” he says.

An external drive would offer the Tinklers the ultimate in ease of installation, but when attached to a USB port, its write speed would max out at 4x. Faster USB 2.0 ports will likely be on the next system the Tinklers buy, but so will an internal CD-RW drive. We decided to search for speedy internal drives that offer the easiest installation, as well as not-as-fast externals that made it under the $200 price ceiling. In both categories we also looked for a useful assortment of bundled software.

Most CD-RW drives tout three speeds: write (often referred to as recording or burning), rewrite, and read. A 16x/10x/40x drive can write to CD-Rs at 16x, write or rewrite to CD-RWs at 10x, and read discs at up to 40x. Because the Tinklers’ primary interest is in burning music CDs, the first number is most important for them.

CHALLENGE

**USER PROFILE**

Janet and Steve Tinkler, engineers from Phoenix, Ariz.

**COMPUTING NEEDS**

An under-$200 CD-RW drive that installs easily and comes with useful software for making music compilations, disc labels, and data backups.

The speediest internal drive we found for under $200 was the TDK 24/10/40 VeloCD ReWriter, available at Buy.com (www.buy.com) for $134.95 (before a $10 rebate). The 24x-writing drive offers BURN-Proof technology, now common among faster drives to prevent buffer-underrun errors that result in wasted CDs.

Installation is easy, thanks to an assortment of helpful materials in the box, including an IDE cable, mounting screws, a folded guide, and a videotape. The bundled software is a good mix, including TDK Digital MixMaster for handling day-to-day music management, Musicmatch Jukebox for making MP3 and Windows Media Audio (WMA) files, Adobe ActiveShare for sharing images via e-mail or the Web, and Adobe Acrobat Reader for reading the manuals.

Yamaha’s 20x/10x/40x CRW2200EZ also offers a nice blend of features and performance for the price. It’s also well-packaged for beginners. Even though it’s an internal drive, the thorough installation documentation and tons of extras make up for having to break out the screwdriver. And everything you need is in the box, including label-making software and starter labels, Musicmatch Jukebox, and a good backup utility. The drive incorporates its version of buffer-underrun protection called SafeBurn. We found the Yamaha at A2Z Computers (www.a2zcomput.com) for $159.

A little higher on the price scale was HP’s CD-Writer DVD Combo 9900ci. Although, at 12x, the HP records a little slower than both the Yamaha and the TDK, the unit doubles as a DVD-ROM drive. The Tinklers didn’t mention wanting to watch DVDs on their PC, but it’s a nice extra.

HP bundles everything you need to get started, including a pair of blank discs and an array of software. Setup and installation of this internal unit is meticulously explained, and you can find additional technical support on HP’s CD-Writer Web site (www.hp.com). HP sells the unit directly for $199.99, but we found it on the eCost.com site (www.eCost.com) for $169.99.

Our final contender was Iomega’s CD-RW Predator USB. At 4x write, it’s slower than an internal, but it offers the ultimate in easy installation. Simply plug the unit into your USB port, run the installation software, and you’re ready go.

The unit looks great and ships with a decent amount of software, including Roxio’s Easy CD Creator and DirectCD, Musicmatch Jukebox Plus, Adobe ActiveShare, and Iomega’s own QuickSync backup software.

If the Tinklers don’t mind a bit of simple, well-explained installation, they should go with a much speedier internal drive, such as the TDK 24/10/40 VeloCD ReWriter. But if they’re adamant about not cracking open the case, we recommend the Iomega CD-RW Predator USB. It sells direct for $199.95, before a $30 mail-in rebate.

If you want help making a smart buying decision, e-mail the Buying Advisor at buying_advisor@cnet.com.
## COMPUTER SYSTEMS

**Think Value Series 1**
- **Motherboard:** Book-PC
- **CPU:** PII-800 - Upgradable to 1GHz
- **Memory:** 128MB
- **Video:** Integrated 8 - 64MB
- **Storage Size:** 20GB UDMA 7200RPM
- **CD-ROM:** 52x CD
- **Floppy Drive:** 1.44MB
- **OS:** Win 98
- **Sound:** 32 bit, 4 channel, 3D
- **Network:** BenQ
- **Network Integrated 1/100 Card**
- **Modern:** Integrated 56k modem
- **Mouse:** Microsoft IntelliPoint Mouse
- **Keyboard:** Fujitsu 104 Keyboard

### Think Business Series 1
- **Case:** ATX Mid Tower-In-Win
- **Motherboard:** Tyran 1866
- **CPU:** PII-800
- **Memory:** 128MB
- **Video:** ATI XVR7 - BMB AGP
- **Storage Size:** 2068 UDMA 7200RPM
- **CD-ROM:** Sony 52x CD-ROM
- **Floppy Drive:** 1.44MB
- **OS:** Win 98/ME
- **Sound:** Creative Labs Live Sound
- **Speakers:** BenQ
- **Network:** Think 10/100 PD
- **Mouse:** Microsoft IntelliPoint Mouse
- **Keyboard:** Fujitsu 104 keyboard

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We will configure your system based on your specifications!

### Notebook Specials

**Think Model 2260:**
- **14.1" XGA Display:** $1,390.00

**Think Model 8500:**
- **15.1" SKGA Display:** $1,569.00

### Notebook Specifications
- **CPU:** PII - 1.0GHz
- **Memory:** 256MB
- **Storage:** 20GB
- **Optical:** 8x DVD
- **Fax/Modem:** 56K
- **Network:** 10/100
- **Battery:** L-Ion
- **OS:** XP Home
- **Multimedia:** Sound

### MOTHERBOARDS
- **Tyran 1864:** $95.00
- **Tyran 2005 Duo Flip Chip:** $219.00
- **Tyra 2151 Duo/Socket Chip:** $399.00
- **STK 1218 Socket A T-Bed:** $85.00
- **Atlas A5A1426 266MHz + Audio:** $149.00
- **ASUS A2U26 526 v.4 LIN Audio:** $153.00
- **AMD A2900GA LP 4x 4LAN:** $130.00

### Memory
- **512MB DDR 266 NON ECC:** $44.00
- **128MB SDRAM PC133 NON ECC:** $39.00
- **256MB SDRAM PC133 NON ECC:** $44.00
- **128MB SDRAM PC266 NON ECC:** $27.00
- **256MB SDRAM PC266 NON ECC:** $21.00

### Video Cards
- **ATI Xpert98 AGP 9MB:** $30.00
- **ATI Xpert128 AGP 16MB:** $32.00
- **ATI Rage Fury MAX 64MB:** $27.00
- **ATI Xpert2000 AGP 32MB:** $21.00

### CD-ROM / DVD
- **Pioneer DVR-11 14x:** $82.00
- **Sony 1715 CD-ROM 52x:** $39.00
- **Sony CD 1011 CD RW 16x CD RW + Easy Creator:** $199.00
- **Trident 212710 12 CD RW 12x PX2 EIDE:** $139.00
- **Toshiba 3214112 601 24x CD RW:** $153.00
- **Pioneer 201 D3 DVD Recorder:** $619.00

### Storage / Hard Drives
- **Maxtor 10GB 5400RPM UDMA:** $99.00
- **Maxtor 20GB 7200RPM UDMA:** $115.00
- **IBM 30GB 7200RPM UDMA:** $115.00
- **IBM 40GB 7200RPM UDMA:** $129.00
- **WD 100GB 7200RPM ATA100:** $249.00
- **WD 40GB 7200RPM ATA100:** $109.00
- **Fujitsu 40GB 7200RPM ATA100:** $89.00
- **Seagate 36GB 10000RPM SCSI:** $840.00
- **Seagate 36GB 10000RPM SCSI:** $425.00
- **Seagate 18GB 10000RPM SCSI:** $175.00
- **Iomega ZIP 250GB DE w/Cart & Kit:** $89.00
- **Iomega ZIP 250GB DE (Drive Only):** $79.00

### Notebook Specials
- **External Firewire Drive:** $49.99
- **CompactFlash Cards:** $319.00
- **PCMCIA Cards:** $120.00
- **SmartMedia Cards:** $120.00
- **PCMCIA Cards:** $60.00
- **PCMCIA Cards:** $30.00
- **PCMCIA Cards:** $19.00

### Digital Media
- **CompactFlash Cards:** $319.00
- **PCMCIA Cards:** $120.00
- **PCMCIA Cards:** $60.00
- **PCMCIA Cards:** $19.00

### LAN
- **Think 10/100 PCI Card:** $10.00
- **Intel 82545EB EtherExpress Pro100:** $45.00
- **COMPAQ 3CP000 PCI W/3COM:** $45.00
- **Think 8 Port Switching Hub:** $55.00
- **Linksys 300M Switching Hub:** $99.00
- **Linksys WAP Wireless Network Access Point:** $159.00
- **Linksys WAP Wireless Network PC Card:** $89.00

### Sound
- **Creative Labs Live Chat 51:** $105.00
- **Creative Labs Sound Blaster Live:** $45.00
- **ESS 52 Sound Card:** $20.00
- **CLB Flat Panel Speakers**: $39.00

### Other
- **We also carry Compaq, Cisco, Toshiba, NEC, Kingston, Mitsubishi, DLI, Hotgurt, Intel, HP, OLdsko, Panasonic & hundreds more!**

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< Tech Shopping

aberdeeninc.com
Targeting savvy consumers, Aberdeen features extensive specs on a wide variety of peripherals and accessories. The catalog of motherboards spans nine major manufacturers and includes a side-by-side comparison tool.

accessmicro.com
Access Micro stocks tons of items ranging from broadband routers to complete desktop systems. The help desk and hardware guide provide aid to first-time visitors, and the clearance area offers returned items and old inventory for below wholesale cost.

allcables.com
Plug it in and hook it up at AllCables, which sells fiber-optic cables, IEEE 1394 (FireWire) cables, printer cables, power cables—cables of every description. Most include a lifetime replacement warranty.

allstarshop.com
The Allstar Microelectronics catalog of PC accessories includes graphics cards, motherboards, and peripherals. The selection in some categories is modest, but prices are reasonable, and you’ll find an ample amount of information about each product.

batteriesdirect.com
Empower yourself! Batteries Direct sells batteries for laptops, camcorders, and portable phones, as well as AC adapters for portable computers. If the kids’ toys are running on empty, check out the selection of rechargeable nickel-metal-hydride batteries in sizes ranging from AAA to D.

blackbox.com
Get connected! Specializing in network products, Black Box’s extensive catalog of storage, cabling, and surge-protection products—plus many other connectivity accessories—can be viewed online or off.

buy.com
Buy.com’s vast million-product inventory includes computer hardware, software, electronics, video games, books, music, and DVDs. Shoppers will find informative pages that make choosing the right peripheral painless.

buycase.com
Banish the boring beige box forever! Colorcase offers more than 60 unusual computer cases, including translucent-plastic, aluminum, mirrored, and “character” cases. (Be sure to check out the doggy- and kitty-shaped cases.)

buydig.com
A site for shovels and trowels? No, BuyDig.com offers digital tools and gadgets, including digital cameras, fax machines, PDAs, DVD players, and video-capture devices.

www.buyuptime.com
BuyUptime.com’s protection and security inventory includes uninterruptible power supplies and accessories, batteries, and power-distribution units. The selection ranges from simple surge protectors to industrial transformers.

cablemax.com
CableMax will get you more wired than a double-strength espresso. The company manufactures and sells cables of all types. In addition to computer and bulk cable, the site

etronics.com
There’s something for everyone with a love for gizmos and gadgets at Etronics. Audiophiles will appreciate the huge selection of home, car, and personal-audio devices. Shutterbugs will find a mammoth array of cameras, film, and photo accessories in the Digital Imaging area. And Etronics’ Home Theater section will tempt movie mavens with televisions, DVD players, and surround-sound setups.

The site’s online catalog goes beyond the call of duty by serving up niche products. You’ll find a selection of DJ gear, as well as car electronics items such as radar detectors, GPS navigation systems, and CB radios. Home-office equipment, appliances, and personal-care products round out the selection.

The well-organized site is a pleasure to navigate. One standout section, the easily searchable Battery Central, makes it easy to track down portable power for your laptop, camcorder, or cell phone. The Rebate Center is also handy, with a concise listing of special incentives from manufacturers. Best of all, however, is the return policy. If it turns out that your shiny new gadget isn’t everything you hoped for, send it back—Etronics offers a 30-day money-back guarantee, with no restocking fees.
sells networking products, adapters, tools, and test equipment.

cablestogo.com

Cables To Go sells every conceivable cable you might need for your PC, from standard SCSI to esoteric system-specific cables. You'll also find networking products, bulk cable, tools, and test equipment. You might even get lucky and snatch up what you need at a bargain price in the site's closeout section.

www.cd-recordable.com

The U.S.-owned and -based CD-Recordable Factory Store actually manufactures the discs it sells. This easy-to-navigate site stocks a massive variety of CD-R discs, including colorless and tinted media, plus disc-packaging and -storage accessories.

cdw.com

CDW offers an enormous array of hardware and software for business. Create side-by-side comparisons in many product categories, and search out dollar-saving deals on the rebates-and-coupons page.

circotech.com

If a beautiful PC case stops you in your tracks, visit Circo Technology, which offers a large selection of attractive and functional cases. For the maximum in upgradability, check out the roomy "cube" cases.

compgeeks.com

Revenge of the nerds, indeed! Shop the Computer Geeks Discount Outlet for new, discontinued, and refurbished computer gear. It's a trove for the do-it-yourselfer piecing together a desktop system.

The site features low prices and complete specs on every product.

compusa.com

The well-organized CompUSA rounds out the usual selection of PC hardware, peripherals, and accessories with areas devoted to electronics and gadgets. The site's new Game Fixx arm specializes in PC and console games.

computers4sure.com

In the 19 well-stocked departments at Computers4Sure.com you'll find a broad spectrum of products, including networking equipment, PDAs, and scanners. Bargain hunters can quickly sniff out deals on the Clearance pages.

computersurplusoutlet.com

You're just crazy enough to build your own desktop system, aren't you? Then you'll feel right at home at Computer Surplus Outlet, where you'll find closeouts, overstocks, refurbished equipment, and liquidation items. You might even stumble upon an assembly-required Pentium system for less than $100.

crucial.com

One of the largest providers of memory upgrades on the Web, Crucial Technology offers free shipping on CompactFlash cards and RAM for 11,000 computer systems. The company backs its memory with a lifetime warranty.

c-source.com

The catalog at decade-old CompSource includes a full range of PC products—nearly 200,000 in all. The company promises same-day shipping, but watch out for the 15 percent fee on returns.

dalco.com

Dalco Electronics stocks everything from motherboards to monitors. If you're a bargain hunter, start with the specials found on the home page. You'll also find a helpful motherboard/CPU and memory configurator.

dartek.com

Dartek sells a remarkable selection of hardware, software, networking equipment, and office furniture. Well-designed features include printable spec sheets, customers' product ratings, a product-watch feature, and a frequent-buyers' club.

directron.com

Specializing in computer peripherals, Directron.com offers low prices on a wide variety of name-brand and OEM products. Most items include a 30-day guarantee, and any order earns you the right to pick through the Free Stuff bin. Savvy savers will appreciate the Clearance area, as well as frequent-customer and volume-purchasing discounts.

ecost.com

The eCost.com catalog spans the full range of PC hardware and software, including ready-to-use systems, peripherals, accessories, and applications. The Bargain Countdown will tempt you with time-limited deals.

euclidcomputers.com

Euclid Computers stocks laptops from eight manufacturers, PDAs from seven, and a smattering of wireless accessories and GPS receivers. Use the filter tool to hone your laptop choice by CPU speed, screen size, and weight.

flexguard.com

Philadelphia Security Products will make sure your PC stays right where it belongs—on your desk. The site sells a variety of lock and cable kits to protect your notebook or desktop computer against thieves.

www.freecolorprinters.com

It's not a scam—"qualified organizations" can indeed apply for free color printers at FreeColorPrinters, a subsidiary of Xerox. You'll need to commit to printing a certain number of pages per month and buy your supplies directly from Xerox. See the site for details.

fwdepot.com

Catering to both Mac and PC users, FireWire Depot sells IEEE 1394 drives, cables, repeaters, and upgrade cards. You can buy an empty enclosure, then populate it with your own drive—online assembly instructions show you how.

googlegear.com

Targeting corporations and smaller businesses, Googlegear sells a tempting selection of PC systems, hardware, and software. Check out the savings in the Open Box Shop and the miserly $1 Marketplace.

handspring.com

Get a Handspring PDA direct from the source. The sleek-looking site sells Visor handelds, add-on modules, accessories, and software.

igo.com

iGo bills itself as a "mobile technology outfitter." Use the site to outfit your cell phone, notebook, or PDA with chargers, batteries, and other
necessary accessories. The iGo Alerts feature delivers free customized news to your portable device.

**inkfarm.com**

We're not sure what type of farm printer ink comes from, but we do know that inkfarm.com sells ink and toner with flat-rate shipping. Go with "official" OEM ink or opt to save big bucks with aftermarket ink that costs about half the price.

**www.ink4art.com**

Sure, you'll find the usual selection of inkjet cartridges, but Ink4Art also sells distinctive goodies that will make your printer happy. Offerings include fluorescent ink cartridges, unusual paper, and project kits for printing on T-shirts and mouse pads.

**insight.com**

With more than 110,000 items for sale, Insight offers an impressive catalog of hardware and software. Customized sites are available for shoppers in the United States, Canada, Germany, and the United Kingdom.

**jandr.com**

Hardware, software, home-office products, and appliances abound at J&R Computer World, the New York City-based superstore famed for its selection and, ahem, "brusque" service. Avoid the attitude with this online version, which specializes in cameras, both digital and traditional film models.

**kidstation.com**

The family computer shouldn't be a pain for children to use. The main attractions at KidStation are ergonomic mice, keyboards, and computer furniture designed with the little ones in mind. But you'll also find fun and educational kid-centric software.

**lanblvd.com**

Wrestling with your old router? Network card not working? LanBlvd.com specializes in networking products. You'll find hubs, routers, interface cards, and wireless stations, along with other essentials for your LAN.

**laptoptravel.com**

Laptop Travel is road-warrior heaven! The site sells portable computing and international-travel gear, including electrical adapters, modem converters/couplers, and security accessories. You'll find traditional and "camouflaged" laptop carrying cases, laptop RAM, and storage add-ons.

**www.medistore.com**

Burn, label, and store discs with a little help from MediaStore. The site sells CD-R, CD-RW, DVD-R, and DVD-RW discs, as well as drives, software, labels, and media-packaging material. If burning audio CDs is your thing, visit the site's MP3 section.

**megahaus.com**

MegaHaus' catalog of "everything high-tech" offers a full spectrum of products, from mice to monitors.

The site specializes in storage, including hard drives, RAID solutions, and CD recorders.

**mei-microcenter.com**

MEI-Micro Center offers new and refurbished desktops from Compaq, eMachines, Hewlett-Packard, and PowerSpec. You'll also find a decent selection of peripherals. Rummage through the bargain bin for deals on closeouts, refurbished units, and overstocks.

**memman.com**

Desktop and laptop memory sold at Memory Man carries a lifetime warranty, and the site's reference guide offers RAM-configuration info for all brand-name computers.

**memory4less.com**

Memory4Less.com offers low prices on a wide variety of RAM. Don't know the memory requirements of your computer or digital camera? The site will clue you in.

**mobileplanet.com**

MobilePlanet is home to a gaggle of high-tech tools and toys for mobile professionals. The selection includes notebooks, PDAs, wireless communication products, and travel-size printers and scanners.

**motherboardexpress.com**

Don't be overwhelmed by the array of more than 100 boards at MotherBoard Express. The site's search engine will filter the choices by processor type, onboard controller, chipset, case type, or number of CPUs.

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**Home Networking Products and Resources**

**cable-dsl.home.att.net**

The Navas Cable Modem/DSL Tuning Guide offers impartial recommendations of hardware and software for sharing your Internet connection between computers. This thorough document covers just about every operating system and networking technology you can name.

**homepcnetwork.com**

If you're baffled by networking jargon and don't know where to begin, start here. HomePCNetwork explains how to set up a simple home network. Beginners can choose topics such as "connect my laptop to my PC" or "connect my two PCs as cheaply as possible." The hardware reviews provide analysis for shoppers with a more technical bent.

**homepna.com**

The focused and informative HomePNA.com is dedicated to HomePNA, a type of network that moves data over your household phone lines. You'll find plenty of reviews of HomePNA products and links to tutorials.

**personalhomenetworks.com**

Personal Home Networks sells the hardware you need to get your PCs talking in no time. The selection includes hubs, switches, cable/DSL modems, and wireless and wired routers. Choose an Easy Installation Kit for simple, no-fuss hookups.

**practicallynetworked.com**

Practically Networked will help you through every step of setting up and securing your home network. Whether your network will be wired or wireless, this site shows you how to share files and an Internet connection among your machines.

**technocopia.com/homenetwork.html**

Need to know how to install a CAT-5 Ethernet cable, or how to set up a home network for gaming? Technocopia's Home Networking guide has the answers, along with reviews of inexpensive networking hardware.
motherboards.com
In addition to a wide selection of motherboards with copious technical specs on each, Motherboards.com serves up honest reviews from picky system shoppers like you. If you order a motherboard and CPU together, the company will configure and test them for you.

monitorexpress.com
Monitor Express sells 500 models of new monitors, plus money-saving refurbished ones. The catalog also includes monitor cables, video adapters, and screen filters.

monitoroutlet.com
Flat-panel LCDs, Monitor Outlet proffers a wide range of displays. The site sells units from 24 manufacturers, plus specialty monitors such as touch screens, wide-aspect-ratio units, and projectors.

newegg.com
You won’t have to shell out big bucks or scramble for hardware at NewEgg.com. Peck at the site’s listings of new products and top sellers, then take a crack at the

Mac Hardware and Software

club-mac.com
Join the club! ClubMac’s selection of Macintosh hardware, peripherals, and software is tough to beat. Click the tabs to zoom in on USB or IEEE 1394 (FireWire) add-ons; then pick your Mac model from the menu for a list of compatible RAM. The site’s technical library serves up self-help.

dealmac.com
Dealmac is an independent price-comparison site that seeks out the lowest prices on Mac hardware, software, and gadgets. Peek into the Basement for super deals on out-of-warranty products.

macmall.com
MacMall is a vast and easy-to-browse catalog of Apple products. Look in the Mac Professionals section for 800 products for publishing, Web development, and graphics pros. The Built for Mac OS X section highlights software compatible with Apple’s shiny new operating system.

macresq.com
Looking for an inexpensive Mac for school or work? Visit Mac-Res-G, an independent Apple reseller with a wide variety of refurbished hardware and new software. A weekly e-mail update will keep you abreast of new products, price reductions, and specials.

maczone.com
In business for 16 years, Mac Zone sells an incredible collection of new Macintosh hardware, accessories, and software. Special features include a rebate center and information about Apple Instant Loans.

powermax.com
PowerMax Computers sells brand-new, custom-configured Macintoshes, as well as preowned systems. The company will even take your old Mac in trade toward a new one. Peripherals and software round out the selection.

smalldog.com
Small Dog Electronics sells new, used, and refurbished Macintosh computers and accessories. The computer selection consists primarily of speedy G4 systems and iMacs, but budget shoppers will also find very inexpensive older models.

store.apple.com
Apple Computer’s well-designed site allows you to custom-configure any Macintosh computer, and offers a wide array of Mac-compatible software and accessories. For frequent customers, the one-click ordering feature makes purchases simple.

nxgen.com
Next Generation’s Web site is densely packed with prebuilt computers and peripherals ranging from cables to graphics cards. The selection is huge, and the site provides full specs and plenty of details about each product.

1coolpc.com
A cool computer is a happy computer. 1CoolPC specializes in fans, heat sinks, and other cooling devices for your CPU, graphics card, monitor, hard drive, and other components that tend to swelter.

outpost.com
Outpost.com sells around 170,000 products—a full range of computer hardware, plus cameras, electronics, and innovative specialty products from partner companies.

palmgear.com
Users of handhelds will appreciate the extensive selection of free and commercial programs downloadable from PalmGear.com. You can buy PDA hardware and accessories, or sign up for an e-mailing list to receive information about new software, news, and user tips.

pccasegear.com
Trick out your computer at PC Case Gear, an unusual site for serious PC-enthusiasts. You can pick up a window kit that will let you see inside your PC case. Couple that with a neon- or cathode-light kit to make your machine glow from the inside.

pccconnection.com
PC Connection offers bargains on a colossal variety of PC and Macintosh products. Smart Selectors ease the search process for those looking for turnkey systems, cameras, printers, monitors, or memory to fit specific guidelines.

www.pcliquidator.com
The getting’s good at PC Liquidator, a site that offers clearance, refurbished, and overstocked hardware and software. The inventory is always changing and usually

specials. Order carefully—the 15 percent restocking fee might make you squawk.
inexpensive. You can find many hardware choices for under $10—and software for 99 cents.

**pcmall.com**
Shoppers at PC Mall receive free lifetime technical support on the site's vast selection of computers, hardware, and software. The site's business-solutions forum offers corporate leasing and volume pricing. Apple-heads can find all their favorite Macintosh products at the Mac Mall sister site (www.macmall.com).

**pcnation.com**
You'll pledge allegiance to PCNation after seeing its catalog of 70,000 hardware, software, and networking products. The home page offers links to "best buys" and to products with special rebates.

**pczone.com**
PC Zone stocks an impressive selection of all things PC. You'll find links to a clearance area and other stores: Mac Zone and Electronics Zone. Printable rebate coupons can save you some cash.

**www.shabar.com**
Safe Harbor specializes in digital video, animation, graphics, and multimedia tools. The selection includes video workstations, video-capture cards, and software for music and video professionals.

**shopper.cnet.com**
The CNET Shopper search engine takes the guesswork out of finding a deal on hardware, software, and accessories. The price-drop-alerts feature will send you e-mail when the cost of a coveted gadget falls. (CNET Networks is Computer Shopper's parent company.)

**ssdonline.com**
At State Street Direct, shoppers will discover a huge selection of computers and imaging products. Digital-camera shoppers will find many items of interest, including customized comparison charts.

**staples.com**
Yeah, they've got that. Staples' Web site offers a liberal price-matching policy on computer accessories, software, and office supplies. If you order similar items often, you can set up personalized shopping lists. The company can occasionally take its time shipping items out to you, though, so beware.

**store.palm.com**
Put a personal digital assistant in the palm of your hand. Here’s where Palm sells its popular PDAs, plus software, accessories, and replacement parts. Reconditioned and discontinued models are available at a significant discount.

**superwarehouse.com**
SuperWarehouse.com stocks printers, monitors, hard drives, scanners, digital cameras, and laptops. The site’s selection of printers is particularly large, and even includes plotters, dot matrix units, and other special-use printers.

**suppliesusa.com**
Feed your PC’s ravenous appetite for media, ink, and other everyday consumables at Suppliesusa.com, a distributor of brand-name printer and computer supplies. The catalog includes data-storage supplies, printer accessories, papers, and film.

**surpluscomputers.com**
Surplus Computers buys and sells corporate excess, overstock, and slightly obsolete PC hardware and software. The hardware choices include desktops, notebooks, and computer parts. The software selection includes operating systems and office suites.

**tccomputers.com**
In business since 1988, TC Computers sells fully configured systems and peripherals. The company's specialty is motherboards; buyers can have boards and processors preinstalled and tested without paying extra.

**www.tigerdirect.com**
TigerDirect's site offers 50,000 products, including computers from Compaq, Gateway, and IBM. For a little adventure? Order a build-it-yourself custom PC kit, and let the fun begin!

**triocomputers.com**
TriComputers.com offers an impressive array of computer accessories and configure-your-own PCs. Read the site's 10-step tutorial on building your own PC to see if you're up to the challenge.

**warehouse.com**
The three "warehouses" under MicroWarehouse’s roof sell PC hardware, Mac products, and datacomm components. The site accepts corporate, educational, and government accounts, and offers business leases on several of its products.
Online Coupons and Deals

amazing-bargains.com
The coupon codes at Amazing-Bargains.com will shave dollars off the bottom line at more than 100 online merchants. Visit the site for daily specials, a list of popular bargains, and info about the newest deals all over the Web. Newsletters bring savings news to your mailbox.

dailydeals.com
The coupon pages at DailyDeals present a cornucopia of codes that can save you $5 to $50 at major online retailers. The First Time area links to sites with substantial discounts to first-time customers.

dealchecker.com
You'll find lots of coupon codes at DealChecker, but don't miss out on the site's tips for savvy shoppers. These articles cover topics such as using one-time credit-card numbers and "taking the bait out of rebates."

dealnews.com
Deal yourself in! Updated daily, Dealnews is a fantastic buyer's guide that reports on low-price specials in Web stores. Sister site Dealram shows the sites offering the best prices on computer memory.

fatwallet.com
FatWallet.com is an elegant, comprehensive trove of coupon codes. Use them to save up to 40 percent at hundreds of online merchants. In the Deals of the Day section, you'll find pointers to noteworthy specials for Web buyers.

freebitz.com
Web shopping doesn't have to mean spending money. FreeBitz is an index of sites that offer products or information for free, such as pet-food samples, CD-ROMs, and magazine subscriptions. There's plenty of good stuff, but beware of scams and spam.

valpak.com
Type your ZIP code, and ValPak will show coupons that you can use at local brick-and-mortar merchants. When you find a deal you can't resist, print the coupon and go.

Direct PC Vendors

adamant.com
Adamant Computers' desktop and notebook systems are backed by a three-year warranty and lifetime technical support. Systems are highly configurable, including your choice of AMD and Intel processors.

www.alienware.com
Alienware can build you a gamer's dream system, high-performance workstation, or desktop video machine. System cases are available in a rainbow of out-of-this-world colors.

buyabs.com
Exceptional customer support on custom-configured desktop and notebook systems is the goal at ABS Computer Technologies. All systems include a 30-day money-back guarantee, and some are available with Linux preinstalled.

buy-atlas.com
Atlas Micro offers desktop PCs built around Pentium, Celeron, and AMD processors. Buyers can use drop-down menus to create a custom configuration and are protected by a reasonable 30-day return policy.

compaq.com
Three arms of Compaq Computer's site offer

web buyer

SITE REVIEWS

computers for everyone. See the Compaq AtHome division (athome.compaq.com) for home and home-office systems, DirectPlus (www.directplus.compaq.com) for business PCs and servers, or the Compaq Factory Outlet Superstore (www.compaqfactoryoutlet.com) for big bargains.

cyberpowerinc.com
Each CyberPower PC includes a three-year warranty and 30-day money-back guarantee. The site's service area includes downloadable drivers and lifetime tech support.

dell.com
Dell Computer's electronic storefront has always led the way in ease of use. The site is jam-packed with detailed information that makes it a snap to match a machine to your needs. Each system is configurable to the nth degree via drop-down menus, and you can get quick access to online support customized for your PC.

www.fujitsu-pc.com
Fujitsu's site focuses on portable computing, including notebook PCs and pen-based tablet computers. Each computer includes several warranty options. A trade-in program offers cash back on your old computer when you upgrade to certain models.

gateway.com
One of the biggest players in online computer sales, Gateway has an enormous and informative site that sells custom-built desktops and portables. Check out the Deal of the Week and "free upgrades" center.

hpshopping.com
At this site, Hewlett-Packard sells its lines of desktop and notebook computers, handhelds, PDAs, digital cameras, scanners, and printers. The site makes repeat purchases simple for businesses and individuals.

ibm.com/products
ShopIBM sells business and home PCs, notebooks, servers, thin clients, networking equipment, and peripherals. The build-to-order option allows buyers to customize a new desktop.
Xi® Mtower™ SP:  
“Faster Than 2-GHz P4™”² - PC-WORLD Dec. 2001  
The power to create even the most intense video project!  
The AMD Athlon™ XP processor 1900+ with QuantiSpeed™ Architecture¹ outperforms competitive 1.9GHz processors.

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@XiComputer.com

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© 2001/2002 Xi Computer Corporation. All rights reserved. Non-responsible for typos. Copyright (c) 2001/2002 Xi Computer Corporation.
idot.com
From low-cost budget models to powerful monster machines, iDot carries customized desktops and rackmount servers.

microexpress.net
Micro Express offers built-to-order desktop and notebook computers featuring AMD and Intel processors. Each system includes a 30-day guarantee and a one- to four-year warranty. Business leases are available.

micronpc.com
One of the largest direct PC vendors, MicronPC sells computers to home-office users, larger businesses, government buyers, and buyers outside the United States. The Factory Outlet offers refurbished and discontinued systems.

nutrend.com
Custom-configure a home or business desktop PC at NuTrend Computer Products. The company stocks machines running your choice of Intel or AMD processors. Each system comes with a three-year warranty.

www.polywell.com/onlinestore
Polywell Computers may not be a household name, but the company offers desktops, notebooks, workstations, and servers that are worth a look. You'll find massive custom-configuration options.

sagernotebook.com
Specializing in notebook computers, Sager offers a variety of options, from budget machines to speedy multimedia units. Service includes a 72-hour repair-turnaround guarantee and lifetime free tech support. Business leases are available.

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shoptoshiba.com
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SonyStyle is a sleek-looking site selling Sony's line of VAIO desktops and notebooks, plus digital cameras, displays, and storage devices.

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**Athlon XP 1500+** $599

**Athlon XP 1600+** $699

**Athlon XP 1700+** $799

**Athlon XP 1900+** $1,029

**Athlon XP 2000+** $1,079

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- **VIA KT266A/DDR 333MHz w/AGP Mainboard**
- **2 Serial, 1 Parallel, 2 USB Ports**
- **10/100 Ethernet Card**
- **64MB Geforce MX-400 64MB AGP Video Card**
- **64MB 128MB DDR Memory 240-pin**
- **2GB UltraATA 100 Hard Drive**
- **16X DVD-ROM Drive cuddle**
- **44X Floppy Drive**
- **Internet Scroll Mouse PS2**
- **Web Turbo 2000 Keyboard PS2**
- **3D Stereo Speaker**
- **Desktop Microphone**
- **1 Year On-Site Service, add $29**

**Athlon XP 1500+** $599

**Athlon XP 1600+** $699

**Athlon XP 1700+** $799

**Athlon XP 1900+** $1,029

**Athlon XP 2000+** $1,079

### XP Gamer ES

- **320 watts Medium Tower Case w/2 Extra Case Fan**
- **VIA KT266A/DDR 333MHz w/AGP Mainboard**
- **2 Serial, 1 Parallel, 2 USB Ports**
- **10/100 Ethernet Card**
- **64MB Geforce MX-400 64MB AGP Video Card**
- **64MB 128MB DDR Memory 240-pin**
- **2GB UltraATA 100 Hard Drive**
- **16X DVD-ROM Drive cuddle**
- **44X Floppy Drive**
- **Internet Scroll Mouse PS2**
- **Web Turbo 2000 Keyboard PS2**
- **3D Stereo Speaker**
- **Desktop Microphone**
- **1 Year On-Site Service, add $29**

**Athlon XP 1500+** $589

**Athlon XP 1600+** $589

**Athlon XP 1700+** $579

**Athlon XP 1900+** $509

**XP Gamer ES** $869

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- **320 watts Medium Tower Case w/2 Front USB Ports**
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- **2 Serial, 1 Parallel, 4 USB Ports**
- **10/100 Ethernet Card**
- **64MB Geforce 2 128MB 512MB DDR AGP Video Card w/TV Out**
- **64MB 128MB DDR Memory 240-pin**
- **2GB UltraATA 100 2000 rpm Hard Drive**
- **16X DVD-ROM Drive cuddle**
- **44X Floppy Drive**
- **Internet Scroll Mouse PS2**
- **Web Turbo 2000 Keyboard PS2**
- **3D Stereo Speaker**
- **Desktop Microphone**
- **1 Year On-Site Service, add $29**

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**Athlon XP 1800+** $1,499

**Athlon XP 1900+** $1,549

**XP Gamer Pro** $1,599

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- **VIA KT266A/DDR 333MHz w/AGP Mainboard**
- **2 Serial, 1 Parallel, 4 USB Ports**
- **10/100 Ethernet Card**
- **64MB Geforce 2 128MB 512MB DDR AGP Video Card w/TV Out**
- **64MB 128MB DDR Memory 240-pin**
- **2GB UltraATA 100 2000 rpm Hard Drive**
- **16X DVD-ROM Drive cuddle**
- **44X Floppy Drive**
- **Internet Scroll Mouse PS2**
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- **10/100 Ethernet Card**
- **64MB Geforce 2 128MB 512MB DDR AGP Video Card w/TV Out**
- **64MB 128MB DDR Memory 240-pin**
- **2GB UltraATA 100 2000 rpm Hard Drive**
- **16X DVD-ROM Drive cuddle**
- **44X Floppy Drive**
- **Internet Scroll Mouse PS2**
- **Web Turbo 2000 Keyboard PS2**
- **3D Stereo Speaker**
- **Desktop Microphone**
- **1 Year On-Site Service, add $29**

**Intel Pentium-4 4.1 GHz** $1,059

**Intel Pentium-4 1.7 GHz** $1,079

**Intel Pentium-4 1.8 GHz** $1,109

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<th>Model</th>
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<table>
<thead>
<tr>
<th>Type</th>
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<tr>
<td>Audigy Live Platinum</td>
<td>$189.00</td>
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## OPTICAL DRIVES

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## ZIP & JAZ DRIVES

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## MAXOPTIX 5.2GB

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## IP Camera

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## PCMCIA Type II Adapter (16/32/64/128)

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## Parallel Adapter Jaz Traveller (SQ32M1)

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<tr>
<td></td>
<td>SQ32M1</td>
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<thead>
<tr>
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<th>Internal</th>
<th>External</th>
<th>External, Quantum case, DAT6400QX</th>
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Quantum.

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**Seagate**

**Drive Case**

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<th>Backup Exe</th>
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<td>$1059</td>
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**Wide SCSI CD ROM**

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Search by System Model Number

Dell Dimension 8100

Search by Module Part Number

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**CD & DVD Duplicators**

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The Internet has become a necessity for many small offices and homes today. Whether used for conducting business, entertainment or education, the Internet has wound itself into our lives.

Today, it's not uncommon for a household to have more than one computer. If you do own multiple PCs, you may want to consider setting up a network. A network is a very efficient way for computers to talk to each other while sharing resources such as an Internet connection, printer, and data storage. Some of the first home networks, however, used messy cables to connect to one another. They weren't exactly easy to setup and often needed technical networking expertise.

Now the advent of wireless networking has solved all of that. No more wires and no more headaches. Instead, wireless networks use radio signals to transmit data securely, up to 100's of feet, to each computer on the network. With only a few pieces of hardware you can have a network setup in a matter of minutes and share Internet access, file storage, printers, or go head-to-head with friends or family playing the latest games - on the Internet or off!

Getting started is easy. First, you'll need what's called a Wireless Access Point. This device connects directly to your broadband modem and acts as a secure gateway for all the information that is passed between your computers and the Internet. Some Wireless Access Points include options such as built-in printing capabilities or "print servers". This feature allows you to connect a printer directly to the network, allowing all your computers to access the printer at any time. Another feature to look for is an included router or switch. These built-in devices act as "traffic cops" to direct the data that's passing through the access point in the most efficient manner, therefore eliminating slowdowns or "bottlenecks" that may hinder performance.

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To connect to the network you'll need a Wireless Networking Adapter for each computer. This is the device at each computer that sends and receives the signals from the access point - completing your network connection. Wireless networking adapters are available for both notebook and desktop computers in external and internal configurations.

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<tr>
<td>S1086793</td>
<td>NEC 17&quot; AccuSync 70 Monitor</td>
<td>$149.95</td>
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<tr>
<td>S1392510</td>
<td>Samsung 19&quot; SyncMaster 9508 Monitor</td>
<td>$199.95</td>
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<tr>
<td>S1433053</td>
<td>Planar 15&quot; FWT1503Z Flat Panel (black)</td>
<td>$369.95</td>
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<td>S1107740</td>
<td>Sony 15&quot; SDM-M51 Flat Panel</td>
<td>$459.95</td>
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<tr>
<td>S1119870</td>
<td>ViewSonic 17&quot; VE170 Flat Panel</td>
<td>$719.95</td>
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**More Notebook PCs**

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<tr>
<td>S1385976</td>
<td>Toshiba Satellite 1800-5204 Notebook: Celeron™-1GHz, 256MB, 20GB</td>
<td>$1,049.00</td>
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<tr>
<td>S1390872</td>
<td>Fujitsu LifeBook C-6631 Notebook: P3-1GHz, 128MB, 30GB</td>
<td>$1,399.00</td>
</tr>
<tr>
<td>S1381024</td>
<td>Sony-VAIO PCG-FAA33: AMD® Duron™-1GHz, 128MB, 15GB</td>
<td>$1,499.00</td>
</tr>
<tr>
<td>S1390587</td>
<td>Compaq EVO N200 Notebook: P3-700MHz, 192MB, 20GB</td>
<td>$1,799.00</td>
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<td>S1309555</td>
<td>IBM ThinkPad R30: P3-1GHz, 128MB, 30GB</td>
<td>$2,049.00</td>
</tr>
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<td>S1095759</td>
<td>128MB CompactFlash Card</td>
<td>$66.95</td>
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<td>S1113763</td>
<td>192MB CompactFlash Card</td>
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<td>S197060</td>
<td>32MB SmartMedia Card</td>
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<td>64MB SmartMedia Card</td>
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<td>S1092047</td>
<td>CompactFlash Card Reader</td>
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<td>S1196322</td>
<td>SmartMedia Card Reader</td>
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**RAM Memory**

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<td>S929132</td>
<td>128MB 100MHz, Module for Compaq Desktop</td>
<td>$33.95</td>
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<td>128MB PCI100 Module for HP Omnibook Notebook</td>
<td>$37.95</td>
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<td>256MB Module for Toshiba Satellite Notebook</td>
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<tr>
<td>S1148183</td>
<td>128MB Module for IBM Thinkpad</td>
<td>$34.95</td>
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Ted Waitt Talks Tech

Gateway's chief executive discusses leading-edge products and what he wants to do when he grows up.

BY IAN FRIED AND DAWN KAWAMOTO

Gateway and Technology Leadership: An Oxymoron.

But Ted Waitt, Gateway's chairman and CEO, who earlier this year returned to retake the reins of the company he founded, is hoping to recast the company's image in the second half of 2002. His efforts are sorely needed, as the struggling PC maker seeks to boost its sagging revenues and earnings. Waitt, 38, recently spoke with CNET News.com from Gateway's new headquarters in Poway, Calif.

As you look to reach out to small and medium businesses with your IT solutions, are you also guarding your back with technological innovations?

One of the things the company got away from in the last two years was clear technological leadership. The company became more of a follower than a leader. And if you look at my track record, it's much better to lead than to follow.

I think you're going to see over the next few years more innovative products. Not just with the kind of computers you sit two feet away from, but with products that you sit across the room from. Integration with the TV and consumer-electronics devices, products you hold in your hand, and mobile products, as well as back-end infrastructure products like thin-client servers.

As you look to return to technology leadership, were all the tools in place when you came back?

I think it's more of an attitude than necessarily having the expertise. There are two different pieces. We have always had a kind of a virtual engineering model, where you're picking the best of the best that is out there.

It's just more attitudinal about taking risks. It's having a mindset of... obsoleting your own products and waterflling technology before other people do it, rather than looking in your rearview mirror.

As you look to reach out to small and medium businesses with your IT solutions, are you also guarding your back with technological innovations?

So pushing the flat-panel monitor on desktops is an example of you saying, "Here's a product that's out there, and we think everyone would like it if they had one, if we make it more attractive?"

Right, if we make it more attractive, it costs less to ship, the warranty cost is lower, and it looks better. The price deltas came down to where it's not a huge price delta.

When you have to take risks on products, like Destination [Gateway's PC/TV product], these are products that weren't necessarily financial or market successes. But we also learned a lot from those products, and it put the company in the right light as an innovator and not just a follower.

I take it that the idea for PC/TV combinations for the living room has not gone away, then?

It definitely hasn't gone away. We think the right categorization for digital devices is something you hold in your hand, a mobile-type product, and something you sit two feet away from. That can be a PC, that can be a terminal, but it has an input device. And something that you sit across the room from and look at on a bigger screen—you'd interact with it in a different way, and it's integrated with your other consumer devices.

With digital TV being so expensive, do you see an opportunity with PCs offering a cost advantage? HDTV is pricey, and you can do the same things with a PC and a good monitor.

[Destination] was basically a big-screen PC. And just to change the refresh rate and deal with stable images, rather than moving images, to go from interlace to noninterlace, was not a significant cost delta. But digital TVs cost a lot because there is not a huge market for them.

There is a huge chicken-and-egg problem with new technology: It costs too much, because there are not a lot of people buying it, and because there are not a lot of people buying it, costs too much. Eventually, it breaks through.

At one point, you obviously wanted to pursue other interests. You brought in former CEO Jeffrey Weitzel and got active with your foundation and other things. At what point do you want to go back to that initial plan?

I took a year off, and I spent a lot of time with the foundation, the boards of a few different companies, and I looked at the entertainment business, the sports field. I spent a lot of time just talking to people. It was a quest to figure out what I want to do when I grow up. I can separate myself from Gateway, physically, mentally and emotionally. All I know is it's fun doing what I'm doing.

For a full transcript, and more interviews with people making tech news, see Newsmakers at CNET News.com (www.news.com).
I'm a desktop trapped in a notebook's body.

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• 56K PCI Data Fax Modem
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