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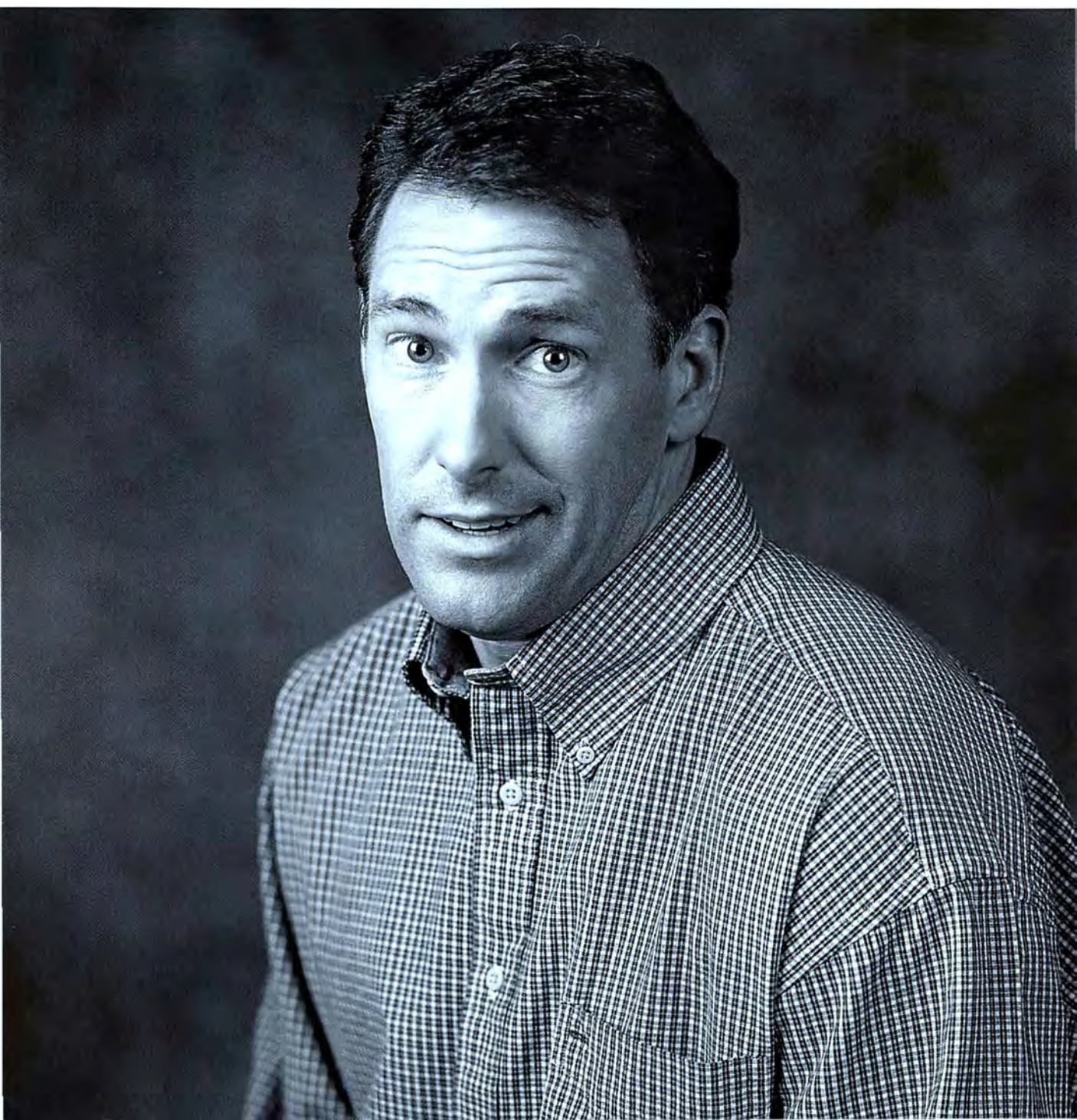
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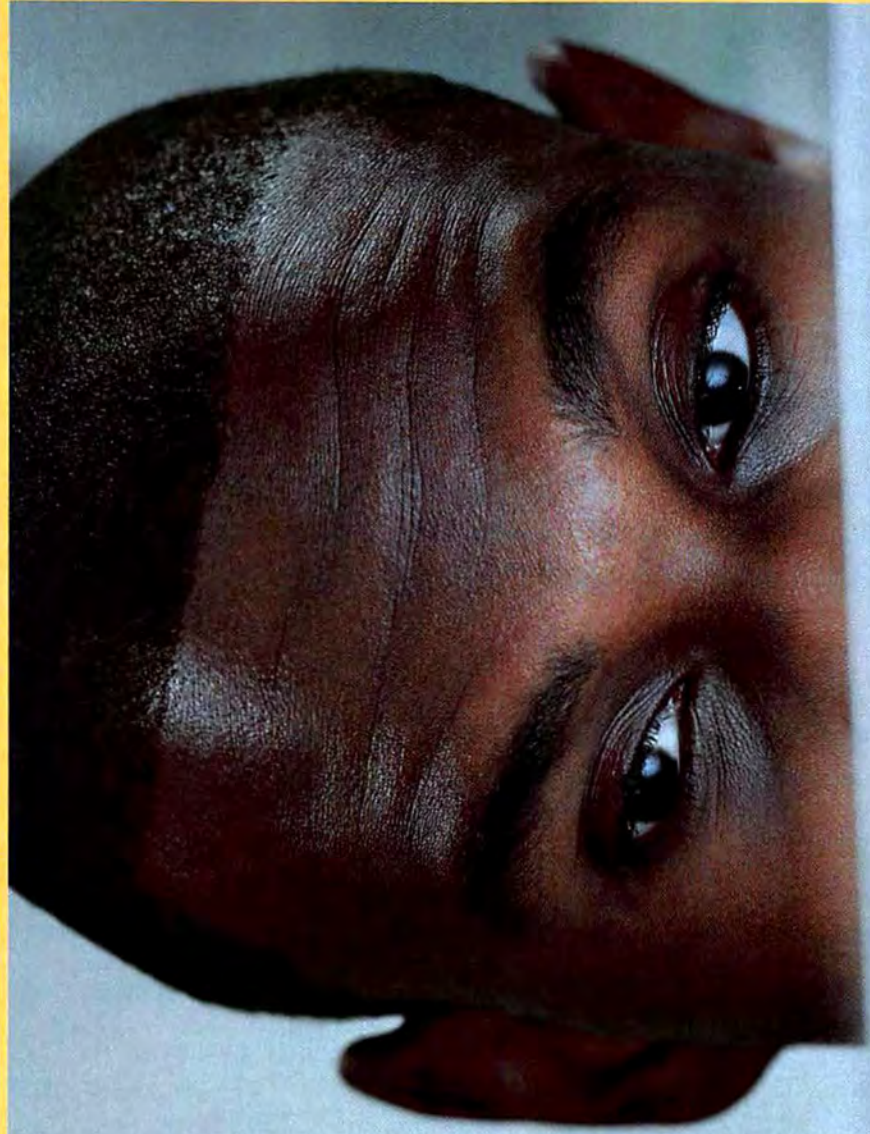
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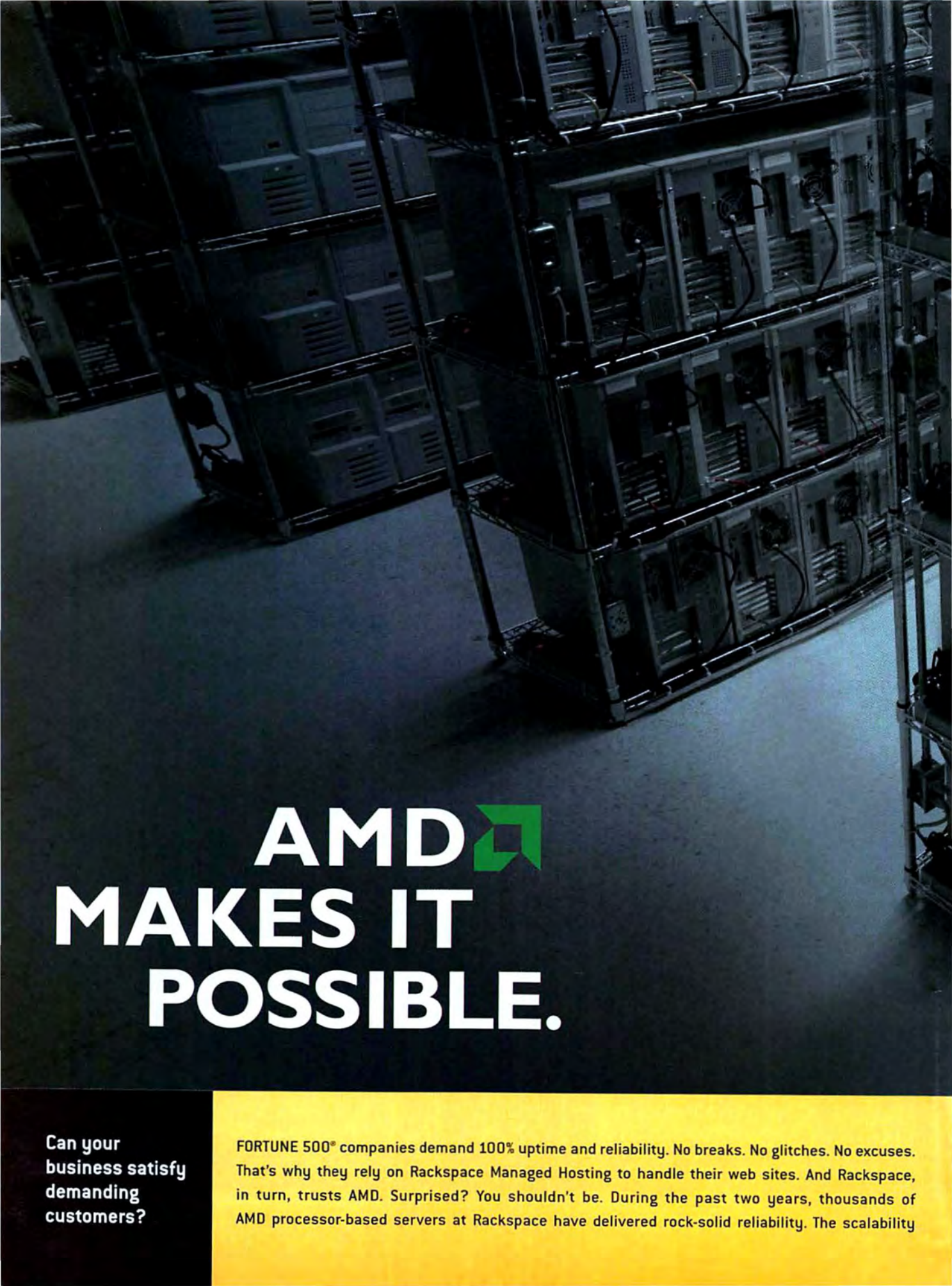
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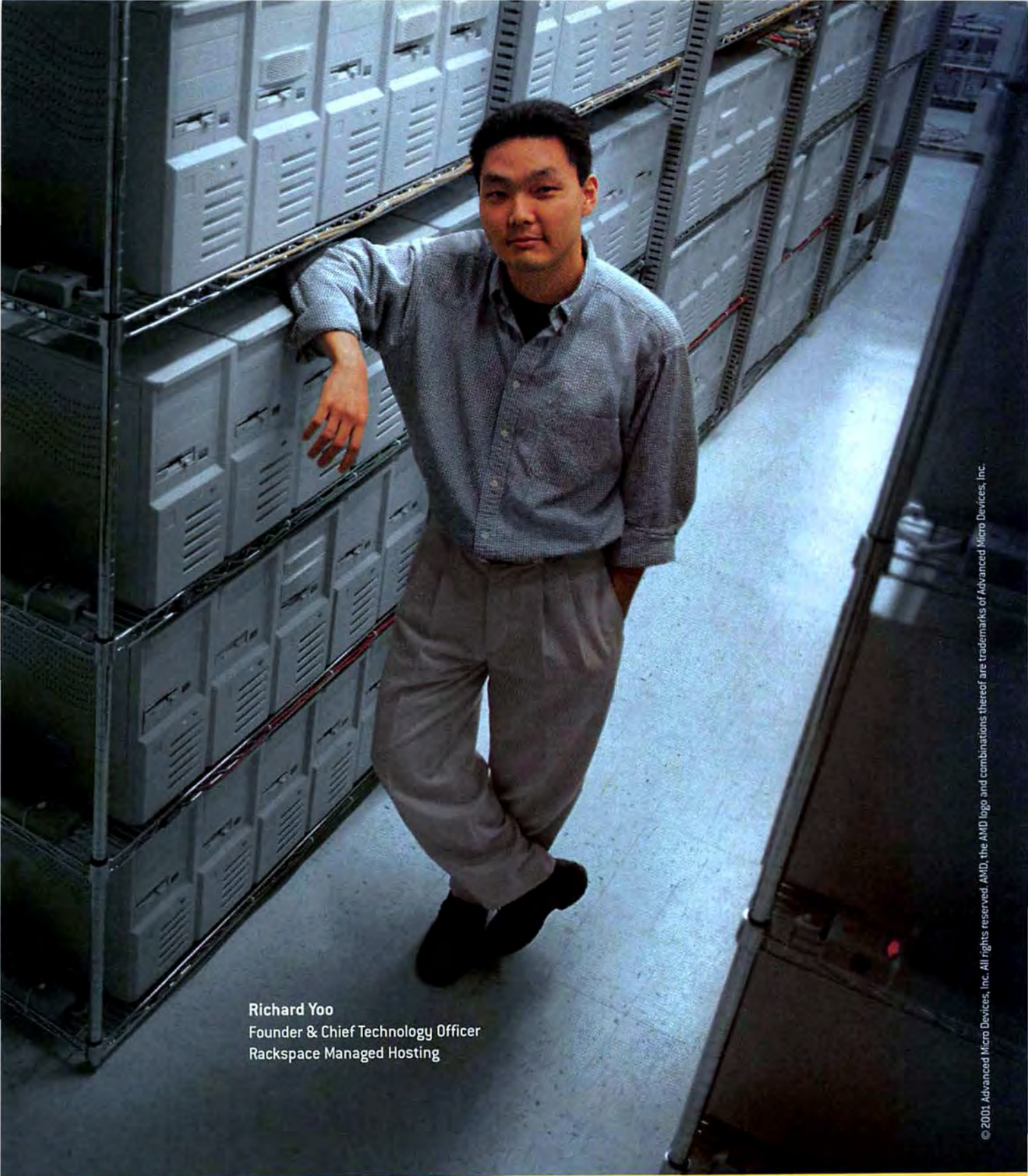
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A man, Richard Yoo, is standing in a server room. He is leaning against a rack of server units on his left. He is wearing a light blue button-down shirt and light-colored trousers. The server racks are filled with various electronic components and are arranged in long aisles. The floor is a light-colored, polished surface.

Richard Yoo
Founder & Chief Technology Officer
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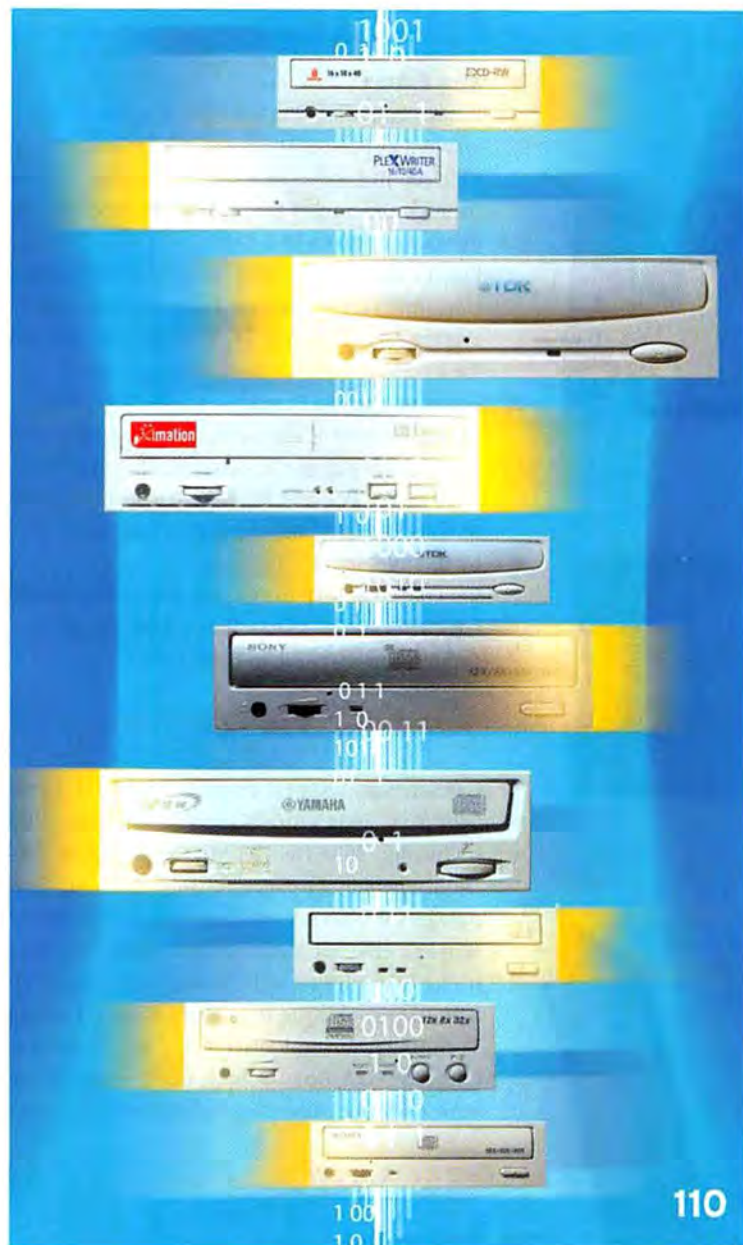
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Implementing a customer relationship management system often takes a long time and can cost tons of money. In many cases, companies can benefit by thinking small. ▶

Cover photography by Marc Simon



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dows and find other ways to optimize your Web connection.

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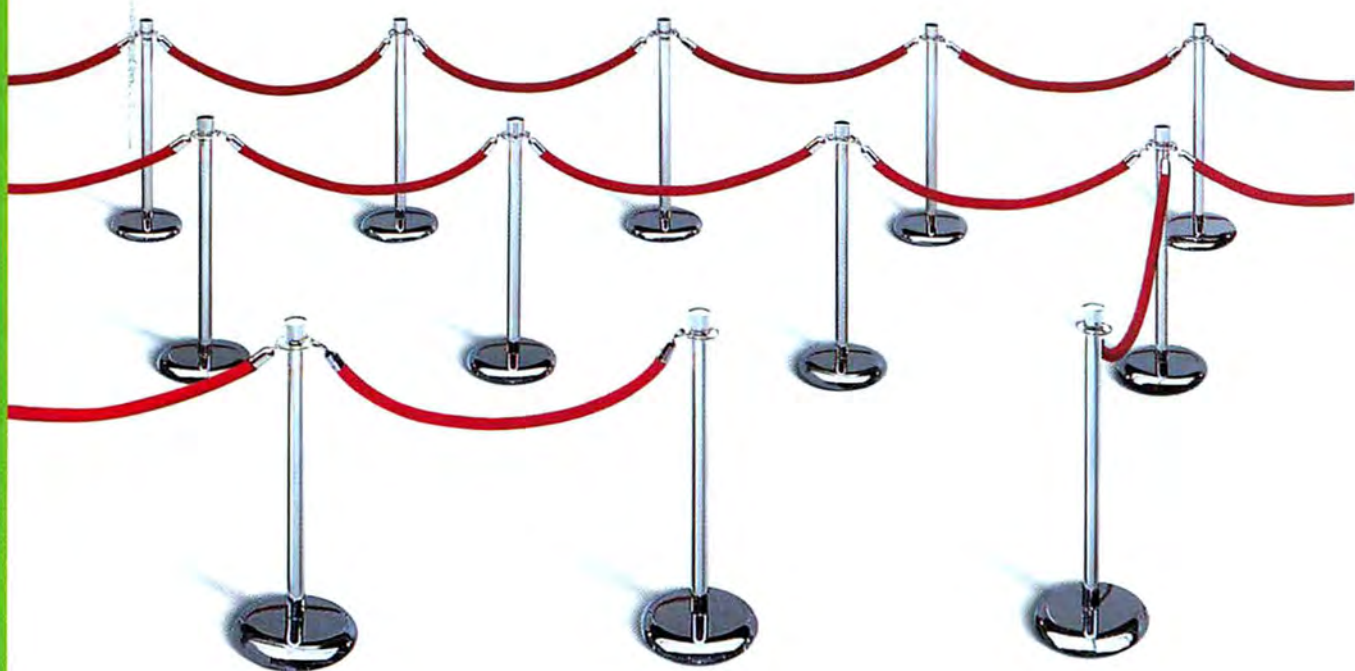
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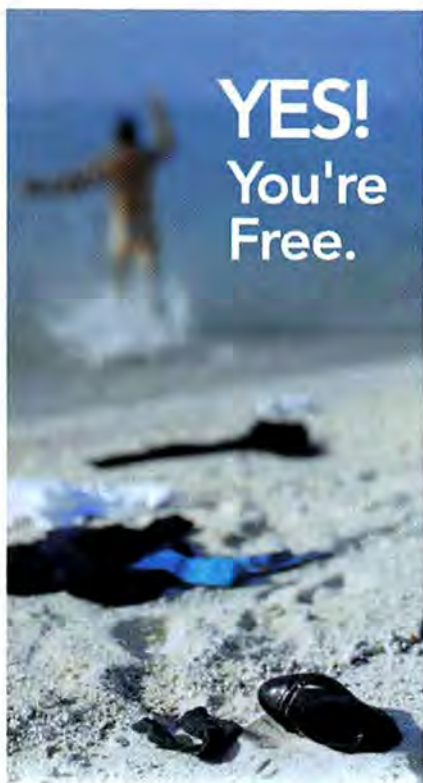
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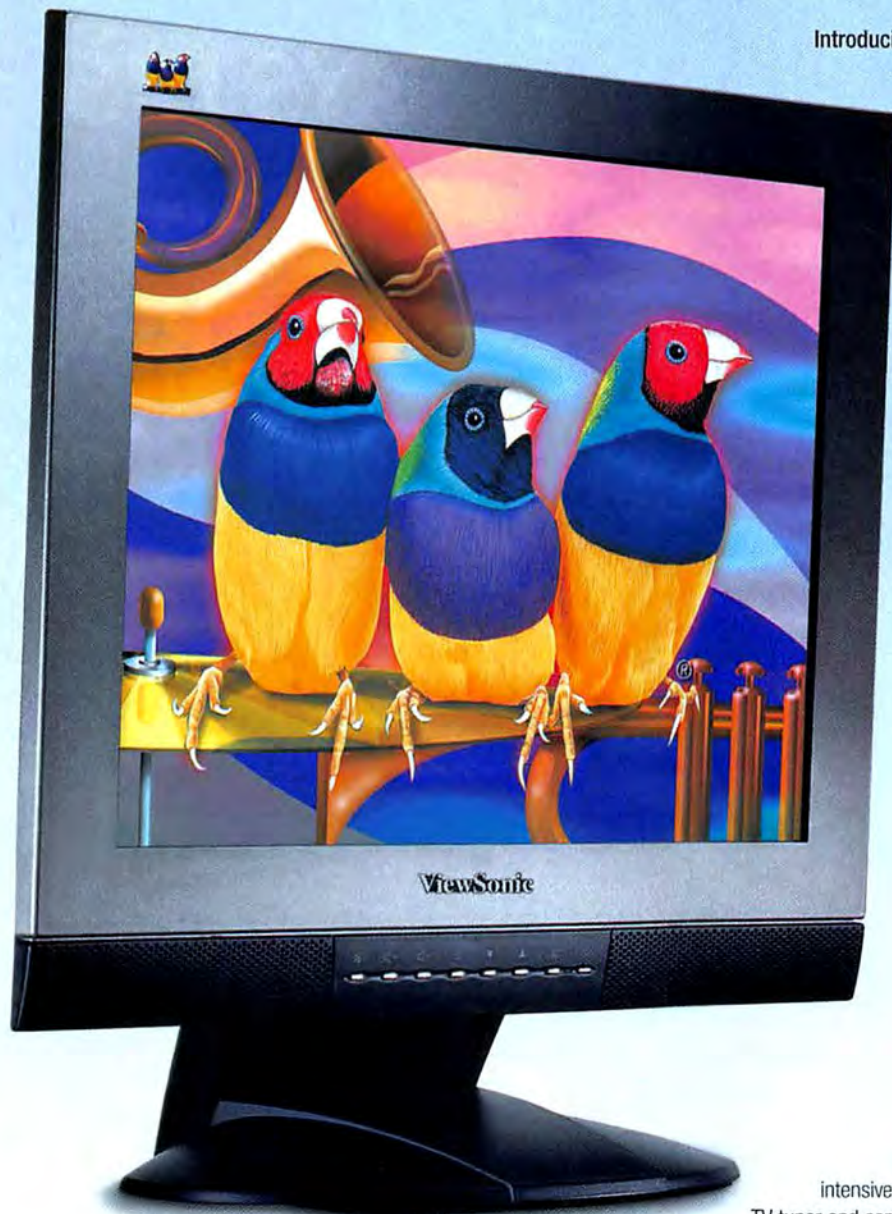
The full 15" viewable screen of the VX500 compares to typical 17" (15.X" viewable) CRT monitors. It includes ViewSonic's exclusive **SuperClear™** technology, delivering 3X faster video response time, a high 400:1 contrast ratio and brilliant colors for photo-like image quality.

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Step up in style with the warm metallic hue and contemporary black accents to complement any décor, at home or at the office. For the video-intensive user, choose the VX500T, complete with integrated TV tuner and composite video and S-video inputs. Imagine others' surprise when you turn to your desktop to watch your favorite television shows. The VX500T is also perfect for video editing.

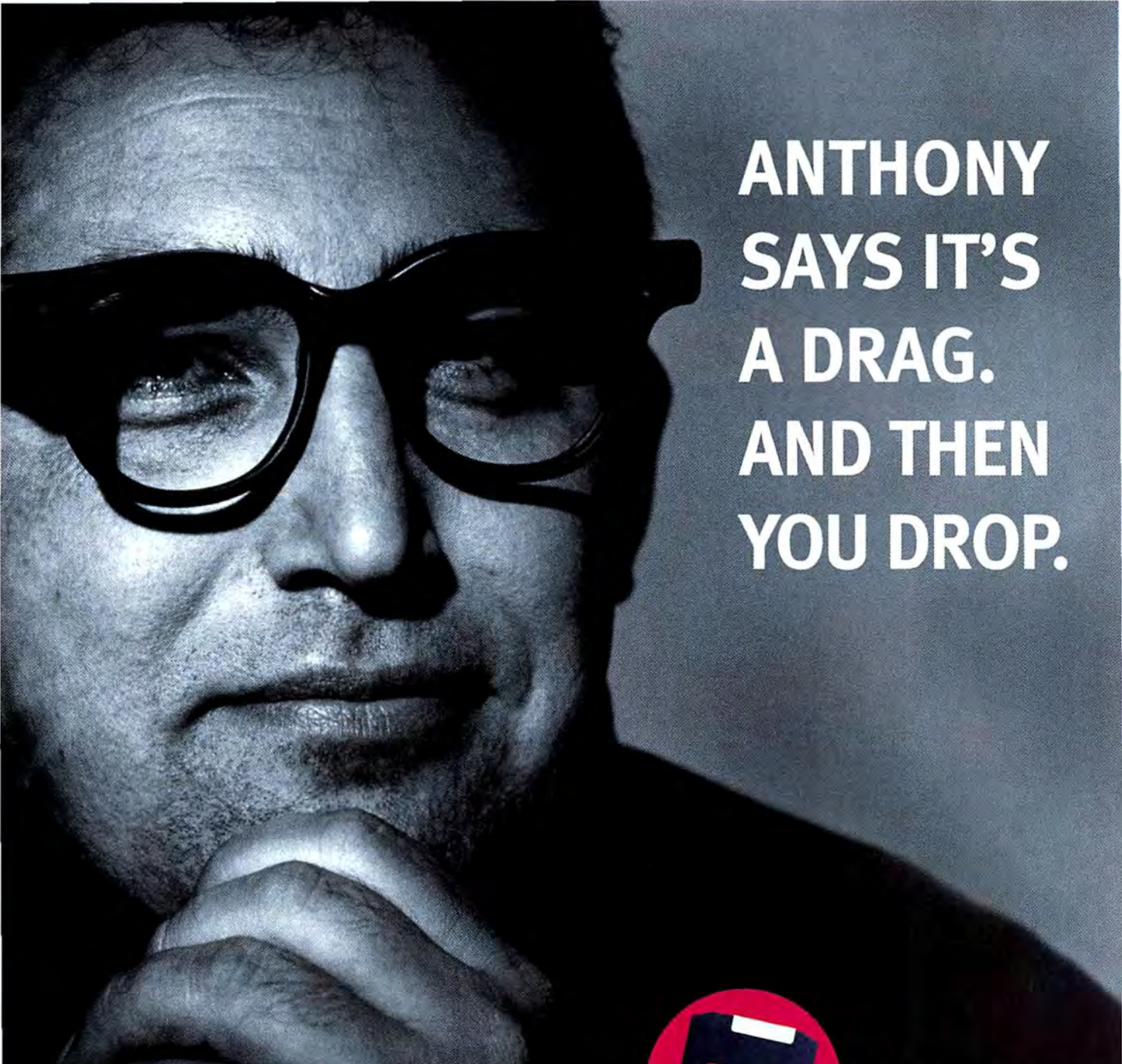
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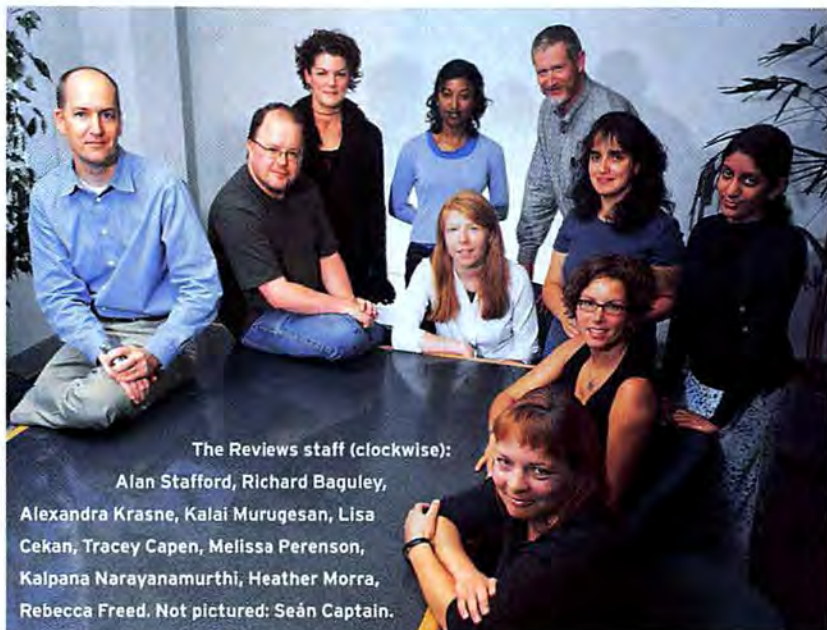


UP FRONT

KEVIN MCKEAN

For These Reviewers, It's All in the Stars

IF YOU'RE LIKE MOST READERS, you come to *PC World* each month mainly to stay informed about the latest hardware, software, and Web services. And if you're looking for a quick impression of the products we review, you may appreciate the magazine's new Star Ratings system.



The Reviews staff (clockwise):

Alan Stafford, Richard Baquley, Alexandra Krasne, Kalai Murugesan, Lisa Cekan, Tracey Capen, Melissa Perenson, Kalpana Narayanamurthi, Heather Morra, Rebecca Freed. Not pictured: Seán Captain.

The ratings, which debuted last month, provide an instant read on our view of a product. *PC World's* writers and editors do a hands-on evaluation and then assign each item a rating from zero to five stars based on its quality, flexibility, utility, ease of use, and other criteria. The system appears simple—so much so that you might think it was easy to devise and implement. We wish! Like most apparently simple systems, the stars conceal a good deal of thought and effort, and I thought you might enjoy a peek into the process and the people behind it.

"We know from reader surveys, focus groups, and the popularity of our *Top 100* charts that people like informed opinions about the products they might buy," explains Reviews Executive Editor Tracey

Capen. "So we wanted a system that would convey our bottom-line feeling about a product—whether we would buy it ourselves, whether we would recommend it to a friend."

COMING UP IN NOVEMBER

Become a Digital Audiophile: Find out where to get digital music, what to play it on, how to create files yourself, and more.
Complete Guide to Windows XP: What's new, what works, and what doesn't—plus how (and whether) to upgrade.

Under Capen's guidance, staffers from several departments (including his Reviews group, pictured here) drew up custom worksheets for hundreds of products. When evaluating a monitor, for example, editors might give more points for lively colors and great controls, and then assign fewer points for fuzzy text. The resulting star rating appears both in the magazine (see the three-star rating awarded to the Cornerstone Peripherals p1650 on page 183) and on the Web site (visit find.pcworld.com/11380).

All of the products in our monthly *Top 100* section go through even more rigorous laboratory screening in the *PC World* Test Center. That's why the *Top 100* charts include both stars and a numerical overall score that precisely weighs in price, performance, and other key categories (see page 183 for an example). As you'll see in the charts, there's a date alongside a rating if the stars were awarded in a previous month. If no date is present, we awarded the rating this month.

We hope that the Star Ratings system proves useful to readers who buy for their business or for themselves. You can write to Tracey about this or any other subject at tracey_capen@pcworld.com, or to me at eddir@pcworld.com. ■

Software Soft Spots: Discover why so many security holes crop up in today's software. Should you be worried?
PC Reliability and Service: In our survey, readers rate PC makers—from the helpful to the ones that leave you helpless.

Tell Us What You Think: Visit www.pcworld.com/pcwininput and rate this issue—you could win \$500. You'll need your subscriber number from the mailing label to take this survey online. The Web site explains the official rules and also how to participate in the drawing if you're not a subscriber. You can enter from September 3 through September 21.

SATELLITE PRO 4600



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NEWS & TRENDS

EDITED BY THE NEWS STAFF

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XP'S EXTRAS

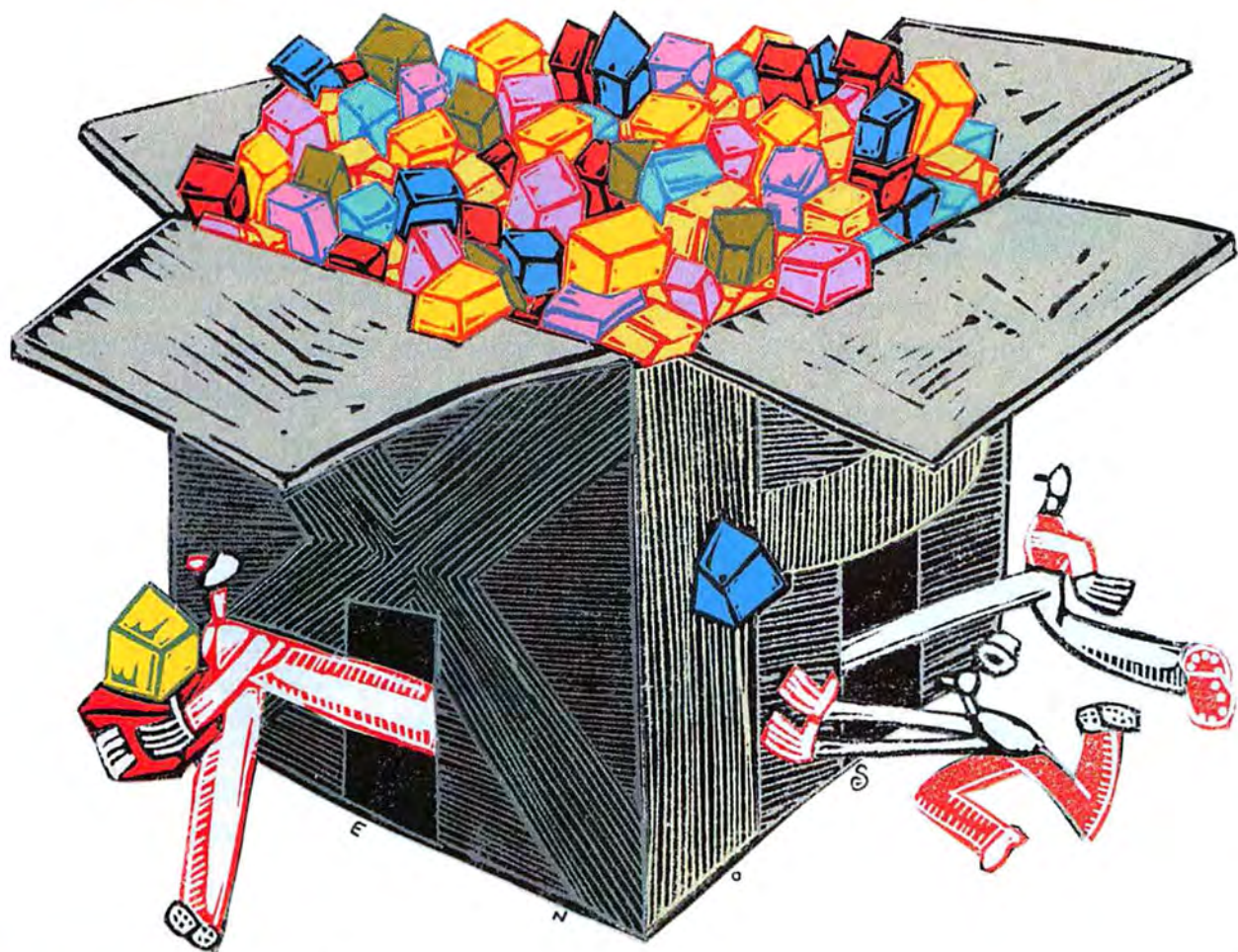


ILLUSTRATION: RANDALL ENOS

FIRST CAME a paint program. Then a memory manager, a defrager, a disk compression program, a media player, and finally a Web browser. Every new version of Windows accumulates more tools. Users generally like them, and most pose no threat to full-blown applications from other vendors, but at least some have contributed to the demise of third-party products. With its latest, Windows XP, Microsoft continues these traditions.

As it has in the past, Microsoft has integrated the Internet Explorer browser into the forthcoming OS—a practice courts have declared anticompetitive. Windows XP also boasts a CD burning capability, a firewall, and support for remote access—new features that previously required installing free or commercial third-party software.

However, perhaps in response to ongoing litigation that might delay the planned October 25 XP launch extravaganza (see page 27), Microsoft has removed some features from the OS. In a clear, albeit small, nod to the courts, the company will allow users to uninstall IE. Most of the new add-ons are feature-light, and often are licensed from the very vendors that sell more-capable commercial packages.

BURNING QUESTIONS

FOR EXAMPLE, Roxio, the Adaptec spin-off that publishes the popular Easy CD Creator CD-mastering package, wrote and licensed the software that gives XP the ability to burn CD-Recordable and CD-Re-writable discs. Roxio also left

out most of the best features of its \$100 Easy CD Creator 5 Platinum version.

Windows XP's software can create an audio CD compilation of songs you've copied with Media Player. It can write batches of data files to CD-R or CD-RW, and it can back up data to CD-R or CD-RW.

On the other hand, Windows XP's software lacks a packet-writing driver for writing files to and erasing them from CD-RW discs in real time. That's a far cry from Easy CD Creator's extensive

WINDOWS XP CONTINUES A LONGTIME MICROSOFT TRADITION: BEEF UP THE NEW OPERATING SYSTEM WITH FEATURES ONCE AVAILABLE ONLY VIA THIRD-PARTY APPS. BUT AS USUAL, YOU GET WHAT YOU PAY FOR.

BY SCOTT SPANBAUER

capabilities, which also include sound editing and noise removal, high-quality MP3 ripping and playlist editing, CD-label printing, video editing, and Video CD creation.

Then there's Windows Media Player, first introduced in Windows 95, which has gradually become more sophisticated and capable. The latest version, Windows Media Player for Windows XP, will be available only as part of Windows XP (Media Player 7.1, a recent update for other Windows versions, offers fewer features but plays the same media file formats). XP's player offers many features available in RealNetworks' RealPlayer and in MusicMatch's MusicMatch Jukebox, includ-

ing the abilities to rip (copy) CD tracks to a hard disk and to play streaming audio and video files from the Internet.

PLAYS BADLY WITH OTHERS

UNFORTUNATELY, many of Windows Media Player's advanced features work only with Microsoft's own Windows Media Audio and Windows Media Video file formats and with their streaming versions, which some popular media players, including RealPlayer, do not support. Microsoft's

player does support other formats, such as MP3 audio and MPEG video, but it doesn't always produce the highest-quality audio with these. The media player for Windows XP will, for example, create MP3 files only at a low-quality 64-kbps bit rate. To get superior-quality MP3 ripping and DVD viewing, you'll have to download (and possibly purchase) third-party applications.

Webnoize analyst Ric Dube says that people who already feel comfortable with another media-player application will just stick with what they have. Microsoft insists that the quality of its file formats is better than the competition's. The company certainly stands to make an e-commerce killing if it can somehow drive people to its media formats and license its digital rights management scheme to media vendors. Whether Microsoft will succeed—or whether its bundling of Windows Media Player is adjudged anticompetitive—remains to be seen.

Windows Messenger, ►

IN BRIEF

Pipeline

MAP IT:
If the 6.2
million

6.2 MILLION

miles of roads in DeLorme's new Street Atlas USA Deluxe 9.0 still aren't enough for you, don't worry. Due out this fall for \$60, the atlas lets you add new roads that are searchable and that you can later use in plotting routes. find.pcworld.com/12420

NOW HEAR THIS: Creative Labs' (www.creative.com) new line of high-definition Sound Blaster Audigy sound cards, due after Labor Day, use new digital-to-analog conversion technology that promises the company's best PC audio to date. Prices will range from \$100 to \$250.

PAGER PHONE: Motorola's \$600 Accompli 009, due out later this fall, looks like a standard-keyboard-equipped two-way pager and text messaging device. But



when you plug in the little headset, it works as a GSM phone. You can also view real images and play games on the unit's 256-color screen. find.pcworld.com/12421

STORE IT: Terapin's \$599 Mine stores 10GB of data that you can transfer over a network, or (if it's music or video) record and play back on a PC, a TV, or Mine's own built-in speaker and 2.5-inch black-and-white display. Running on Linux, Mine is a bit bigger than a cell phone. find.pcworld.com/12440

an improved version of the MSN Messenger instant messaging program used in previous versions of Windows, will compete against AOL Instant Messenger and other free IM programs. But America Online's program is likelier than Microsoft's to receive scrutiny for anticompetitiveness, due to AOL's habit of closing its system to competing products.

SEND A MESSAGE

AT THIS POINT, it's unclear whether Windows Messenger will end up being a threat to third-party alternatives or simply

a seldom-used Internet gadget along the lines of NetMeeting, Windows Movie Maker, and WebTV for Windows. If Internet telephony and videoconferencing were to suddenly take off, Windows Messenger's new voice and video capabilities would give it a marked advantage over competing IM programs, which so far are limited to text chat and file transfers. Of course, both machines must use Windows XP: Messenger's voice and video features don't work with other versions of Windows, much less with other OSs. In

contrast, AOL Instant Messenger can run on Macintosh, Linux, and even Palm devices.

COMPETITION OR COOPERATION?

NOT EVERY extra that Microsoft bundles with Windows XP is a repackaged, licensed, or limited-functionality program. For the first time, Windows includes a firewall to ward off Internet hacking. And although Windows has long permitted traveling users to log in remotely and transfer files, Windows XP Professional's Remote Desktop lets you connect to and take full control of other Windows XP Professional desktop systems over the Internet. The new features compete directly with third-party remote-control and firewall products like Symantec's Norton Personal Firewall (\$50)

fairly rudimentary," she adds.

For example, PC Anywhere offers multiple levels of encryption and various types of authentication, as opposed to one of each in XP's Remote Desktop. The Symantec program is also better suited to corporations because it offers logging, remote management, and support for multiple operating systems. In contrast, both computers in a Remote Desktop session must run Windows XP Professional or a Windows Terminal Services client (these are available for Windows 9x, Me, and CE).

Anson Lee, Norton Personal Firewall product manager, points out that Windows XP's Internet Connection Firewall blocks only inbound traffic and isn't enabled by default. Symantec's firewall, on the other hand, controls which local applications can pass through to the Internet—a crucial feature for preventing Trojan horse applications from handing control of your computer over to hackers. Symantec's product also monitors outgoing traffic for sensitive personal data.

Zone Labs' \$40 ZoneAlarm Pro and the company's free



A WINDOWS FIRST: XP's firewall provides basic hacker defense.

WINDOWS ADD-INS

THE APPS OF WINDOWS PAST

LIKE A TEENAGER decorating an old bracelet with new charms, Microsoft has traditionally buffed up successive versions of its operating system by adding utilities, applications, and games. Here are some examples:

Windows 3.0 (1990): Macro Recorder, Solitaire, File Manager, extended memory management

Windows 3.1 and 3.11 (1992-1993): TrueType fonts, fax utility (Windows for Workgroups), networking software (Windows for Workgroups)

DOS 6.0 (1993): File compression, disk defragmentation and backup, automated memory management, disk caching

Windows 95, Windows 95 OSR2 (1995-1996): Quick View file viewer, Internet Explorer browser, Dial-Up Networking, Windows Media Player, system monitoring tools (Net Watcher, Resource Meter, System Monitor)

Windows 98, Windows 98 SE (1998-1999): TV broadcast services (Wavetop, WebTV for Windows), speedup utilities (Fast Boot, Application Launch Acceleration, Map Cache), system maintenance utilities (Disk Cleanup, Registry Checker, System File Checker), Internet Sharing (Windows 98 SE)

Windows Millennium Edition (2000): PC Health tools (System File Protection, System Rollback), multimedia tools (Scanner and Camera Wizard, Movie Maker)

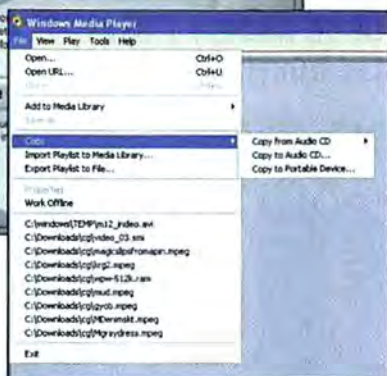


and PC Anywhere (\$180).

But you won't hear Symantec complaining too loudly. "Symantec has always succeeded in extending the functionality of the Windows operating system," says Sarah Hicks, the company's vice president of product management. Windows XP is nothing new, according to Hicks. "The products [included in XP] are



NO MATCH: CD burning is a menu item in XP's media player (right), but Roxio's Easy CD Creator 5 offers much more.



ZoneAlarm firewalls likewise offer bidirectional control of your Internet connection, plus something Microsoft can't claim: years of practical experience securing PCs from online threats. Gregor Freund, Zone Labs CEO and founder, is confident that his product—widely deployed in the real world and repeatedly updated in response to how the protocols are applied, how applica-

tions use protocols, and what kinds of attacks are possible—will continue to attract buyers who are interested in strong security. "That's not stuff that you can just pick up and implement; it's stuff that you experience and refine over time," Freund says.

Gartner analyst Michael Silver doubts that software makers have much to fear in Windows XP. "For consumers, a

lot of this stuff may be good enough. Some of it users get for free anyway, bundled with their new PC." But in contrast, Silver says, businesses typically need stronger features than the bundled utilities in XP have—an industrial-strength firewall, for example.

It's the same story with regard to the CD-burning utility and the other new tools in XP, Silver

says. "For users who are just trying to put a couple of songs on a CD, it might be good enough. For something fancier, they're still going to have to buy a third-party product." With little firm evidence that Microsoft's utility bundling tactics will effectively reopen the browser wars on a new front, the courts and Senate committees may have to live and let Windows XP live. ▶

CAN THIS OS BE STOPPED?

AS A POSSE OF government antitrust lawyers seeks to delay the scheduled October 25 launch of Windows XP, Microsoft claims it will deliver its Swiss-army OS on time. Meanwhile, major computer vendors were privately saying they expected to start shipping systems with XP preloaded by the end of September or early October.

DOWN TO THE WIRE

NEVERTHELESS, as we went to press, the U.S. Department of Justice appeared resolved to seek an injunction to block Windows XP's release (over its "commingling" of browser and operating system code) until courts can determine a remedy for the antitrust violation found in earlier litigation. Microsoft says it will permit users to remove Internet Explorer via the Add/Remove Programs utility, but the Remove option will expunge only the browser's user interface, leaving the underlying code integrated with Windows XP.

Meanwhile, Senator Charles Schumer (D-New York) has called for hearings to investigate whether Windows XP forces buyers to use Microsoft's media player, its instant messaging program, and its other applications. Simultaneously, a consortium of privacy advocates, including the Electronic Privacy Information Center, has filed a complaint with the Federal Trade Commission requesting an investigation into the way Microsoft's Passport authentication system—an integral part of XP's version of Windows Messenger—collects sensitive user data.

On the other hand, many PC and software vendors are looking to XP as a tonic for slumping sales, and Microsoft knows it.

"Frankly, the industry needs this product," Jim Allchin, vice president of the Microsoft Platforms Division Group, told a press conference. Allchin said the company has no contingency plans for changing Windows XP if an injunction is issued.

IN BRIEF

Pipeline

BIG SCREEN: WinBook's J1 800 notebook comes with a Celeron-800 processor, a 14.1-inch 1024-by-768 active-matrix screen, a 10GB hard drive, and 64MB of SDRAM, plus a 56-kbps modem, all for a very reasonable \$999. find.pcworld.com/12441



PORTABLE PROTECTION: StuffBak's lost-and-found service could come in handy if you misplace a laptop, cell phone, or PDA. Purchase and register hard-to-remove labels (\$2 to \$6 each, minimum order \$20) printed with StuffBak's toll-free phone number and URL plus a possible reward offer. You can

90 PERCENT

beef up StuffBak's reward (free labels); you also pay a \$15 handling fee plus shipping. StuffBak says that 90 percent of users who report lost items get them back. find.pcworld.com/12480

Tidbytes

IMPROVED: Netscape 6.1 (find.pcworld.com/12460) is more stable than earlier versions, and it works on more Web sites. Addressing complaints that Netscape 6.0 took too long to load, a Quick Launch option puts version 6.1 into memory when you boot up. But Shockwave 8.5 still doesn't work properly—and games from MSN Gaming Zone won't run at all.

PROCESSORS

PENTIUM 4 RACES TO 2 GHZ

INTEL'S FLAGSHIP CPU FINALLY CATCHES UP TO AMD'S 1.4-GHZ ATHLON. BUT IS THE PRICE PREMIUM REALLY WORTH IT?

INTEL TOOK nearly 29 years to produce its first 1-GHz processor, but just 18 months more to push its Pentium 4 to the 2-GHz mark, further increasing the P4's speed advantage (on paper) over AMD's current crown jewel, the 1.4-GHz Athlon.

But our tests show that despite the new chip's extra megahertz, the Athlon still performs better on some applications. The P4 has closed the gap on most tests, however, and has widened its lead in certain tests, such as video encoding. The P4 should also perform better with apps that have been optimized for it, such as Ulead's VideoStudio 5 and Dragon NaturallySpeaking 5. On the other hand, Athlon-based PCs remain less expensive than P4 systems, making them better values.

We looked at two 2-GHz P4 systems geared toward profes-



HP'S \$3039 CORPORATE Vectra VL800 (left) and Gateway's \$2637 business-minded Professional S2000, both with the new 2-GHz P4.

sional users, both packing 256MB of high-speed PC800 RDRAM and running Windows 2000. The preproduction Gateway Professional S2000 should cost \$2637; the shipping Hewlett-Packard Vectra VL800 costs \$3039 sans monitor. Expect other major ven-

dors such as Compaq, Dell, and IBM to have 2-GHz machines available soon.

POWER PLAY

THE GATEWAY barely outperformed the HP: The Professional S2000 notched a PC WorldBench 2000 score of

235, and the Vectra had a 229.

Both 2-GHz systems scored markedly higher than comparably configured 1.7-GHz P4-based machines we've tested (the PC World Test Center has yet to test a system based on the 1.8-GHz P4, previously Intel's fastest). The Gateway PC was about 9 percent faster than the average score of eight 1.7-GHz P4 machines, a difference you're likely to notice.

The 2-GHz P4 was more evenly matched by AMD's 1.4-GHz Athlon. The average mark of five 1.4-GHz Athlon PCs with 256MB of DDR SDRAM was 239. That puts it in a virtual dead heat with the Gateway unit—pretty good for a chip running 600 MHz (30 percent) slower. Still, this is the first time top-of-the-line Windows 2000-based P4 systems have caught up with high-end Athlon PCs on PC WorldBench 2000.

Previous PC World tests have indicated that P4-based systems tend to outperform Athlon-based machines on video encoding, some music encoding, and certain games. With the faster P4-2000 chip, that lead can only grow. ▶

HARD DRIVES

A FASTER HARD DRIVE HIGHWAY

TODAY'S HARD DRIVES access data faster than ever, but all that speed is useless if the data gets caught in a bottleneck between the drive and the rest of the PC. To let computers take full advantage of hard drives' zippier speeds, Maxtor recently unveiled its new Ultra Advanced Technology Attachment/133 standard.

The new standard builds on the existing Ultra ATA/100 interface but offers a faster transfer rate of 133 megabytes per second (33 percent more than the current stan-

dard). Best of all, the new standard is completely compatible with existing ATA standards—you can even use the same cable.

FUTURE TIMING

THE FIRST PCI cards for PCs featuring the new Ultra ATA/133 standard should hit the market later this year, and new drives won't be far behind. The standard is unlikely to make its way into chip sets and system motherboards until next year.

While Maxtor is pushing its new standard

(it licenses the technology to others for free), the company continues to stand behind the development of Serial ATA, the next big step forward in hard drive interfaces. Development issues have slowed the progress of Serial ATA, however.

The Ultra ATA/133 interface is an evolutionary step, but the Serial ATA interface—with transfer rates starting at 150 MBps—is a revolutionary one. Unfortunately, the Serial ATA interface likely won't reach PCs until at least 2003.

—Tom Mainelli



Projector




Flatscreen monitor



Portable PC



TV monitor

Everybody needs something. And the odds are you can find a good deal on that something at eBay. With millions of items listed every week, we've got just about every presentation tool you could want, new or used. So before you go spending weeks searching for a bargain, you might want to check us out first. Go to ebay.com or AOL keyword: ebay and register where you see this:  [welcome new users](#)



IN THE CASE

NEITHER 2-GHz unit will leave you power-hungry. Both pack a fast NVidia GeForce2 graphics board (the Gateway's has 64MB of memory; the HP's has 32MB), a 40GB hard drive, 10/100 ethernet, and a CD-RW drive. HP throws in its comprehensive system management tools and a 12X DVD-ROM drive, while Gateway bundles speakers, Microsoft Office XP Small Business Edition, and a 15-inch LCD. HP sells monitors separately; a 17-inch HP CRT costs \$259.

At \$2637 including the LCD panel, the Gateway PC is a better value than the \$3039 HP Vectra. HP's management tools may help the latter unit fit more smoothly into a corporate network, however.

Of course, neither price is small. That's especially noticeable when you match the P4 PCs with similar Athlon-1400 PCs from the same vendors.

For example, Gateway offers a Select 1400 Deluxe PC with 256MB of SDRAM, comparable hardware (including the LCD), and Windows Millennium Edition, for \$1858. That's a \$779 difference, and worth serious consideration.

A 1.4-GHz Athlon HP Pavilion geared toward home users sells for \$1623. It combines a

Gateway Professional S2000

(Preproduction unit, not rated)
The unit's ever-so-slightly higher score, flat-panel monitor, and lower price make it a smart buy for Intel-minded users.
\$2637 (estimated)
find.pcworld.com/12080

Hewlett-Packard Vectra VL800

★★★★☆
The HP is solid but seems overpriced even in this class.
\$3039 (no monitor)
find.pcworld.com/12081

40GB drive, 256MB of DDR SDRAM, a 16X DVD drive, GeForce graphics with 64MB of RAM, ethernet, a 17-inch CRT monitor, Polk speakers, Windows Me, and Office 2000 Small Business Edition. And you can get it all for a whopping \$1416 less than the monitor-less 2-GHz Vectra costs.

LOOKING AHEAD

IF YOU really want a P4 system but can hold off buying, you may be better served later this year when Intel launches the next version of the P4.

Code-named Northwood, the new, smaller P4 chip will be made using a .13-micron process instead of the current .18-micron process. It should

launch at speeds faster than 2.3 GHz. Some analysts predict that Intel will double the chip's on-die secondary cache from 256KB to 512KB (as it has already done with the new mobile Pentium III-M), which could translate into a nice performance boost.

Another reason to wait: Intel's upcoming 845 chip set, which will support the P4 and SDRAM (instead of the pricey and controversial RDRAM). It should bring P4 system prices well into the mainstream.

AMD isn't standing still. Look for the next version of AMD's desktop Athlon in the second half of 2001, launching at speeds greater than 1.5GHz. The new CPU is already shipping in mobile form as the Athlon 4; the desktop version still carries the code name Palomino. The chip should include new multimedia instructions, as well as a data-prefetch feature to help speed performance.

If you want top performance and you plan to edit video, the P4 has a lot to offer. If most of your work involves standard business tasks, Athlon-based units are a better value.

—Tom Mainelli ►

IN BRIEF

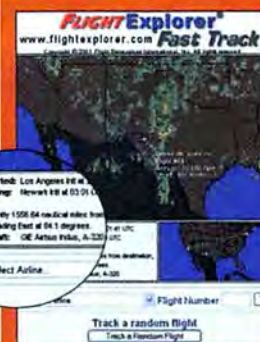
Tidbytes

MUSEUM PIECE: Intrigo's \$80 Lapstation Pro is more than just a portable break-fast-tray-style desk that can fold up to the size of a small



notebook. It's also a thing of beauty, according to the folks at the New York Museum of Modern Art, where it was displayed last spring in the Workspheres exhibition. You can get it (along with accessories) at Intrigo's Web site (www.lapstation.com).

Site to See



WANT TO check the progress of a friend's or loved one's flight? Visit Flight Explorer (www.flightexplorer.com), which specializes in delivering graphical flight-tracking and weather information over the Internet. Enter the airline and flight number into the FastTrack window on the home page, and you'll get a map showing the aircraft's type, location, altitude, speed, and estimated time of arrival. The free service covers the United States (including Alaska and Hawaii), Canada, and parts of Mexico and the Atlantic and Pacific Oceans. Beats a simple "on time" or "delayed."

TEST REPORT 2-GHz P4 CPUs

PENTIUM 4 PULLS EVEN ON BUSINESS APPS

| SYSTEM | Processor | Memory | PC WorldBench 2000 score | Faster ► |
|--|-------------|-----------------|--------------------------|----------|
| Gateway Professional S2000 | P4-2000 | 256MB RDRAM | 235 | |
| HP Vectra VL800 | P4-2000 | 256MB RDRAM | 229 | |
| Average of eight P4-1700 desktops | P4-1700 | 256MB RDRAM | 216 | |
| Average of five AMD Athlon-1400 desktops | Athlon-1400 | 256MB DDR SDRAM | 239 | |



HOW WE TEST: All systems represented here ran the Windows 2000 Professional operating system and were tested with PC WorldBench 2000, PC World's applications-based benchmark. See www.pcworld.com/benchmark for more details on PC WorldBench 2000. A higher score is better. All rights reserved.

HP Color LaserJet 8550



(HP's fastest)

The New Xerox Phaser® 2135



(3X faster)

XEROX COLOR PRINTERS EXCEED ALL SPEED LIMITS.

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DIGITAL CAMERAS

FOCUS ON THE BIG PIXELS

NEW 5- AND 4-MEGAPIXEL CAMERAS BRING SHARPER PICTURES AND BETTER VALUES.

NEW 5-MEGAPIXEL digital cameras are shooting bigger and more colorful pictures than ever. They're costly, but fear not: The release of these models is already reducing prices on still-excellent cameras with lower pixel counts.

With one of these shooters, your photos can be detailed enough to display at even 8-by-10-inch print size. The latest cameras are a significant jump from the 2- and 3-million-pixel models that, save for one expensive 4-megapixel camera, previously ruled the consumer market's top tier.

We looked at the first 5.24-megapixel consumer camera, Minolta's Dimâge 7 (\$1499). Several 5+-megapixel cameras should follow from other major vendors. Or consider the

newest 4-megapixel cameras, which offer compelling value for people who need high-resolution images but are unwilling to pay the premium for a 5-megapixel model.

We tried out a shipping Dimâge 7 unit. As expected, its higher resolution yielded sharper pictures than those from 2- and 3-megapixel cameras, especially with cropped and enlarged images. We saw mixed color results, however.

SHARP SHOOTER

THE DIMÂGE 7's strength is its sharpness, which lets you zoom in much farther and still retain details (see the print comparison on page 34). An extra-long 7X optical zoom makes the super resolution even more flexible—you can



SONY'S DSC-S85 (left) and Toshiba's PDR-M81 (right), a pair of 4-megapixel models; Minolta's 5.24-megapixel Dimâge 7 (center).

get close with the zoom, then crop and enlarge with software to get even closer. A helpful viewfinder cue indicates which part of the image was used to set focus. But unlike competing cameras, such as the Olympus E-10 (a \$1799, 4-megapixel unit), the Dimâge 7 shows you your prospective shot only through its two LCDs (a standard one and the viewfinder). Consequently, you never see a non-

digitized view of your picture.

We got mixed results with color and contrast. Test shots taken beneath clouds looked brighter than ones from some other cameras. But bright sunlight shots had muddy colors and hid shadowed details.

GOING HI-RES

REMEMBER THAT the commonly accepted standard for high-quality printing is 300 dots per inch; the Dimâge 7's best setting creates an image good for just 240 dpi when printed at 8 by 10 inches (see the chart). You'd need images with at least 2400 by 3000 resolution, from a 7+-megapixel camera, to achieve a true 300-dpi print at 8 by 10 inches. An image from a 6-megapixel camera could yield a 278-dpi print, however, which most users would be unable to distinguish from a 300-dpi print, says Chuck Westfall, assistant director for Canon's technical information department.

If you can't see (or won't pay for) the difference a 5-megapixel camera makes, a 4-megapixel unit might be ►

PRINTING

TRANSLATING PIXELS INTO PRINT

BELOW WE LIST common digital camera and image resolutions, and show what their top images translate into when printed. Even today's high-end cameras can't produce images for large prints at 300 dpi to approximate the sharpness of a standard film photo. But even low-end cameras can yield prints that look reasonably good at 4 by 6 inches.

| RESOLUTION | Megapixels | | | | |
|--|-------------|--------------|--------------|--------------|--------------|
| | 1+ | 2+ | 3+ | 4+ | 5+ |
| Typical highest image resolution (pixels) | 960 by 1280 | 1200 by 1600 | 1536 by 2048 | 1704 by 2272 | 1920 by 2560 |
| Equivalent resolution for a 4-by-6-inch print (dpi) | 240 | 300 | 384 | 426 | 480 |
| Equivalent resolution for an 8-by-10-inch print (dpi) | 120 | 150 | 192 | 213 | 240 |
| Equivalent resolution for a 2-inch cropped piece of larger image, enlarged to 8 by 10 inches (dpi) | 30 | 37.5 | 48 | 53 | 60 |

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PRINT VS. PRINT

BELOW ARE TWO cropped, enlarged pieces of test shots, one taken with Minolta's 5.24-megapixel Dimâge 7, and the other with Sony's 3.3-megapixel DSC-S75. Notice the sharper edges in the higher-resolution shot; unenlarged images also look better.



your best bet. Several vendors offer new models in this class.

Canon has just released its \$899 PowerShot G2, a 4.13-megapixel model with notable new features. The G2's new three-point focusing system lets you choose which portion of the frame the camera will focus on. The camera's metering system can also adjust the light level for every pixel shot rather than adjusting based on data from a few regions of the frame, according to Canon.

Also new: Olympus's 4.13-megapixel Camedia C-4040 (\$999); it has the same case and many of the same features as the C-3040 (an older 3.3-megapixel model), including a 3X optical zoom and a wide f/1.8 lens aperture.

Sony's new 4.1-megapixel DSC-S85 uses a high-quality Carl Zeiss 3X optical zoom lens, and it costs less: \$800. Toshiba's 4.2-megapixel PDR-M81 matches the Sony's price; it has a 2.8X optical zoom. Casio's QV-4000 offers 4.13 megapixels and a 3X optical zoom, for under \$1000.

Many 3-megapixel cameras still cost as much as or more than higher-end models, but

prices are dropping. For example, Kodak's new \$449, 3.1-megapixel DX 3900 breaks the \$500 price point; it has a 2X optical zoom. If you can do without a CompactFlash slot and an optical zoom, save \$50 with Kodak's 3.1-megapixel DX 3700 model.

THE HELPFUL BIT

WITH AFFORDABLE 4- and 3-megapixel cameras available—more than sufficient for most uses—vendors are look-

ing beyond resolution to distinguish their products. Like scanner vendors, some camera manufacturers now trumpet color bit depth. The higher a model's bit depth, the greater the range of color captured by the camera and the richer the subsequent image.

Sony's DSC-S85 uses a 14-bit analog-to-digital (A/D) converter, for a total of 42 bits spread over the three color channels. The Dimâge 7 uses a 12-bit A/D converter (for a 36-bit total). Other vendors

still have 10- or 8-bit A/D converters. Users with high-end printers will see the most benefit from higher bit depths: Their pictures should show more subtleties in highlights and shadows, as well as more realistic flesh tones.

A greater number of users may notice other tweaks from specific vendors, however, such as Casio's Best Shot feature, included on its QV-4000 and on the older QV-3500EX. With it, you don't have to remember optimal exposure settings for best image quality every time you take a shot: Just pick the best match from the camera's built-in image database—say, a backlit shot of a person's face—and the camera does the rest.

The Minolta Dimâge 7's Flex Focus Point takes another tack, allowing you to pick the focus of your shot, rather than relying solely on the center-weighted focusing typically found in many cameras. Nikon and Casio offer similar features in their respective high-end cameras.

to your computer more conveniently than with the mass of cables and plugs that you'd otherwise deal with.

MORE RESOLUTION

TO GO BEYOND 5-megapixel resolution, camera technology will need a boost. Forthcoming high-resolution cameras handling bigger, more complex files will require more powerful digital signal processors, better batteries, larger memory buffers, and more storage, say industry experts. Camera bodies may also have to grow to accommodate the larger CCDs (charge-coupled devices) that are needed for the extra pixels.

Jon Sienkiewicz, Minolta's vice president of digital imaging products, says resolutions will continue to climb, though more slowly—because fewer people will need them, not because of technical limitations. "3.3 [megapixels] is fine for most people," he says. And the lower prices of 3-megapixel cameras will increase their appeal to mainstream buyers,

Four-megapixel cameras might be your best bet to balance price and high resolution.

In order to add value, Kodak says it's working on making cameras easier to use—hence the optional docking system the company offers on many of its models. With the dock, you can recharge the camera's battery and download images

according to IDC Research.

But enthusiasts will likely keep clamoring for more, especially since the promised advent of 6- and 7-megapixel cameras in the next few years may finally put digital models on a par with their traditional film cousins, even at large print sizes. For now, you can still get sharp, high-resolution pictures with a 5-megapixel camera, and nearly as high-quality shots with new, less pricey 4-megapixel models.

—Alan Stafford ►

Dimâge 7

Minolta

List: \$1499

Captures highest-resolution images yet, but our color and contrast results were mixed.

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PERIPHERALS

USB: THE SEQUEL

USB 2.0 PROMISES 40 TIMES THE SPEED OF ITS PREDECESSOR—IF YOUR PC CAN GET IT.



DRIVE, FASTER: Addonics' 8X/4X/24X Pocket CD-RW drive (left) performs up to spec with the OrangeLink+ USB 2.0 PCI card.

THESE DAYS, hot-swappable, self-powered Universal Serial Bus ports are standard on nearly all PCs. But with its leisurely data transfer rate of just 12 megabits per second, today's USB 1.1 standard is painfully slow for such demanding, bandwidth-hungry peripherals as external hard drives and CD-RW drives.

But a next-generation version, dubbed USB 2.0 or High-Speed USB, promises transfer rates of up to 480 mbps—fast enough to edge out the principal competition, 400-mbps IEEE 1394 (aka FireWire or

I.Link) ports. You can also plug USB 1.1 devices into a USB 2.0 port (though you won't obtain the faster speed). We looked at one of the first shipping USB 2.0 devices, Addonics' 8X/4X/24X Pocket CD-RW drive, and found a clear performance boost (see the test report).

We tested the Addonics drive in two ways: with a standard, built-in USB 1.1 port; and with a USB 2.0 port that we installed on the same PC using Orange Micro's \$110 OrangeLink+ USB 2.0/FireWire adapter card. In our CD-R tests with USB 1.1, the Pocket CD-RW drive's write speed topped out at about 4.7 mbps (4X), consistent with other external USB 1.1 drives (the bus reaches its maximum 12 mbps speed only in bursts, not as sustained throughput). Through the USB 2.0 port, however, write speeds reached the drive's maximum of 8X, or about 9.4 mbps. (The first devices that will fully exploit

USB 2.0's bandwidth are hard drives, but they weren't available in time for our testing.)

USB 2.0 still has a way to go. First, it lacks the major operating system support that its predecessor enjoys. Even IEEE 1394 has support in Windows 98, Me, and 2000 and in the Mac OS. Also, computer makers are not yet building USB 2.0 ports into PCs. In contrast, IEEE 1394 is a common option for most PCs (and is standard in Apple and Sony systems). Moreover, 1394 is commonly found on consumer electronics and doesn't require a PC; all USB devices do. Finally, 1394 will speed up to 800 mbps by early 2002.

But don't count USB 2.0 out. Microsoft has announced that it will offer downloadable USB 2.0 drivers for Windows 2000 and for the upcoming Windows XP operating system. Linux support for USB 2.0 should come in the first half of 2002. Silicon behemoth Intel currently provides space for a USB 2.0 controller chip on its Pentium 4 motherboards, and Gateway has announced that it will put the chips in some PCs beginning this fall. Intel and Acer Labs plan to put USB 2.0 into at least some chip sets by mid-2002; Via Technologies, on the other hand, will add IEEE

IN BRIEF

Downloads

GO TO find.pcworld.com/12720 to find these files.

TOP 5

- 1 Bounce Spam Mail** 278KB
Send spammers fake bounce messages so they'll leave you alone.
- 2 Ultimate Boot Disk** 602KB
Create a boot disk with more system information than the Windows version has.
- 3 System Mechanic** 1436KB
Fix your PC's problems—and help prevent them from recurring—with these tools.
- 4 AdSubtract SE** 2423KB
Keep annoying banner ads from appearing while you're surfing.
- 5 PhotoJam** 1610KB
Combine your images with music to create a photo album or a music-video slide show.

1394 support to its chip sets before turning to USB 2.0. AMD says it will support USB 2.0, but not how or when.

With USB 2.0-capable hard drives and CD-RW, DVD-RAM, DVD-RW, and DVD-R drives coming from several vendors, USB 2.0 may become a standard feature on PCs in the next year or so. But for now, IEEE 1394 remains the better choice because it supports far more devices, especially digital video camcorders. —Sean Captain ■

Addonics 8X/4X/24X Pocket CD-RW

★★★★☆

Pricy, petite drive adds USB 2.0 support. Street price: \$389
find.pcworld.com/12200

Orange Micro OrangeLink+

★★★★☆

PCI card adds USB 2.0 and IEEE 1394 to PCs. Street price: \$110
find.pcworld.com/12201

TEST REPORT

USB 2.0: BUILT FOR SPEED

| STANDARD | Write 650MB from image file (min:sec) | Write 650MB on the fly (min:sec) | Install Microsoft Office (min:sec) | Extract 350MB of digital music (min:sec) |
|----------|---------------------------------------|----------------------------------|------------------------------------|--|
| USB 1.1 | 19:51 | 19:30 | 7:43 | 7:33 |
| USB 2.0 | 10:09 | 10:11 | 4:25 | 4:47 |



HOW WE TEST: We performed identical tests of the Addonics Pocket CD-RW drive using the built-in USB 1.1 interface on a standard test system and the USB 2.0 interface provided by Orange Micro's OrangeLink+ adapter card. We used our standard CD-RW drive test suite. For details, see "CD-RW ASAP" on page 110.



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With Peerless, you can back up an entire computer on a single disk. It's powerful enough to store all your files, fast enough to run applications straight from the drive, and versatile enough to go anywhere you do. And with up to 20GB on each disk, it has the capacity you want, plus the flexibility to expand easily and affordably.

Basically, Peerless offers all the space you need in one incredible, compact drive. It's the next big thing in removable digital storage. Would you expect anything less from iomega?



Peerless™ is compact (the entire drive fits in your hand), and tough, with built-in shock absorbers.



Peerless offers interchangeable 10GB or 20GB disks—there's always room to grow.



Read/write heads are integrated into each fully sealed Peerless disk, drastically reducing the risk of contamination.



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The Peerless drive supports modular connectivity—you can switch between FireWire® and USB interfaces.



LETTERS

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**HARD-NOSED COPY
PROTECTION**

**KEEPING UP
WITH CHANGE**

**FLAT-PANEL
DISPLAYS**



PRODUCT ACTIVATION DEBATED

I ADOPTED Office XP Professional Special Edition shortly after it was released ["Readers to Microsoft: Copy Controls? No Way!" *Top of the News*, August]. Office XP soon started refusing to save files. A call to Microsoft (after a very long wait on hold) reset the code. A few days later, with only minimal system changes, Office XP shut down. This time, about 20 minutes of surfing turned up a crack program for Product Activation. It worked.

While I feel no ill conscience—after all, I am only using what I legitimately paid for—I wonder how many others are already using this crack to pirate Office XP.

Tom Tcimpidis, via the Internet

WINDOWS XP's Product Activation procedure is very short and simple. I know this because I tried the preview version of XP. My computer has not frozen once in the month I've had it. I think people take the activation feature too seriously.

Josh Pyles, Gladstone, Oregon

I THINK YOU omitted a primary concern: Businesses need to support data formats indefinitely into the future, because of their investment in the data.

I want to be able to open my own files even after my current machine dies—as it will, someday. When that happens,

Microsoft's copy protection might stop me from opening my valuable files—for at least two possible reasons:

1. Microsoft may have gone out of business.
2. Microsoft may decide that I really need a software upgrade, so it won't support the older version. That is, it will refuse to unlock my re-

installation unless I upgrade or convert my installation to a subscription. Even if I accept such extortion, the new program might not open my files properly.

I readily concede that these scenarios probably won't happen. But do you want to bet your business's data on it?

J. G. Owen

Huntington Station, New York

HOT BUTTON

The PC at 20: Some Other Pioneers

YOUR ARTICLE discussing "The PC at 20" [August] missed two pivotal points in the PC's (and Microsoft's) evolution.

The first was the development of a legal, readily available clone BIOS. In May 1984, I was the "virgin" author (I provided consulting services) of the Phoenix Software Associates PC BIOS. Without a well-designed, bug-free BIOS that was available at a reasonable cost, the clone industry might never have taken off.

The second was the development of the first real clone of an IBM chip set—made by Chips and Technologies and available in spring 1986 in sample quantities. Without this clone chip set, cloning might have been too costly for many manufacturers.

Ira J. Perlow

Waltham, Massachusetts

HAVE YOU EVER lent or received a piece of licensed software? If you did, then you just stole. Now it's time to straighten up. Product Activation got off on the wrong foot, but it doesn't hurt to use it. Stop blindly whining and look at the facts.

Greg M. Topf, via the Internet

LICENSE AGREEMENTS, TOO

FROM YOUR article on the trend to accept the wording of End User License Agreements and Terms of Service as legally binding ["What Have You Signed Away Today?" *Top of the News*, August], it seems software vendors are not being realistic about how nonbusinesspeople use their products. Books are not purchased on a one-user-only basis—because only one person at a time can read a book. The same situation applies to most home users with more than one PC. I am ▶

I CAN'T BELIEVE that you omitted the Amiga, the first PC designed from the ground up for multimedia (32-bit preemptive multitasking OS in 1985, plug-and-play, and full color). IBM PCs and Macs were designed to be fancy typewriters that could do only one thing at a time—and adding multimedia to PCs has given us today's bloated operating systems.

Jim Patterson, Cleveland

Author's response: I meant no disrespect for the Amiga, which *PC World* once listed among the ten greatest PCs of all time. But "The PC at 20" was about the IBM PC/Wintel platform. As for multimedia, we noted that Creative Labs' SoundBlaster 16 popularized it for these machines.

—Lincoln Spector

the only user of my two computers. As a result, I find it hard to respect a EULA or TOS that unreasonably restricts my use of a product I purchased.

Barry N. Gorodetzer, Weston, Florida

'IT MIGHT AS WELL BE YOU'

STEPHEN MANES ["A Little Respect for a 20-Year-Old," *Full Disclosure*, August] has coined the business phrase of the millennium! "If somebody's going to devour

your business, it might as well be you" should be the mantra of all companies in all industries. Examples abound of companies trying to kill or ignore a trend or a new idea because it threatened the status quo, and then losing out to others that were willing to take a chance on it.

Too many of us fear change. Instead of updating our skills to learn XML or Java, we think we can get by on our knowledge of the old stuff—until the new replaces it,

and we are no longer an asset. Perhaps we should personalize Steve's phrase, and say to ourselves, "If somebody's going to take my job, it might as well be me."

David C. Everett, Urbandale, Iowa

WHY DISPLAY QUALITY VARIES

IN YOUR review of flat-panel LCDs [*Top 10 Monitors*, August], you comment on the varying picture quality of different brands' displays. Where do those differences come from? Is it the LCD panel? Or the image-processing chip?

Nelson Ko, Mill Valley, California

Editor's response: According to our test center, hardware variables affecting image quality include the panels (manufactured by different companies), the backlighting, the electronics, and the analog-to-digital converter.

—Rebecca Freed ■

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

CORRECTIONS

A SEPTEMBER *In Brief* item on 2-pound projectors (page 28) should have listed the model numbers as V-1080SF (XGA version) and V-807SF (SVGA).

In September's *New Products*, Falcon Northwest's Mach V system actually scored 197 on PC WorldBench 2000, while Alienware's Aurora DDR scored 193.

August's *New Products* should have listed the portable 20GB Pockey drive at \$330.

Contrary to August's "Smooth-Sailing Utilities," no shareware version of On-track's SystemSuite 3 is available from PCWorld.com's Downloads section.

August's *Top 10 Monitors* should have said Samsung's SyncMaster 570vTFT is 14.4 inches high; Samsung's on-site service and money-back guarantee apply only to 17-inch and larger models.

PC World regrets the errors.



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If your notebook's unlocked, your network is too[™]—regardless of other security measures you have in place. In fact, 57% of all network breaches originate on stolen PCs (FBI, 1998). And, replacing a notebook's data can cost your company up to 15 times the value of the original notebook itself. Luckily, protecting laptops is easy; most already come with our security slot designed especially for the Notebook MicroSaver[™]. So why take chances? Buy yourself some peace of mind instead. For purchase information contact your reseller, or visit www.microsaver.com.

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CONSUMER WATCH

ANNE KANDRA

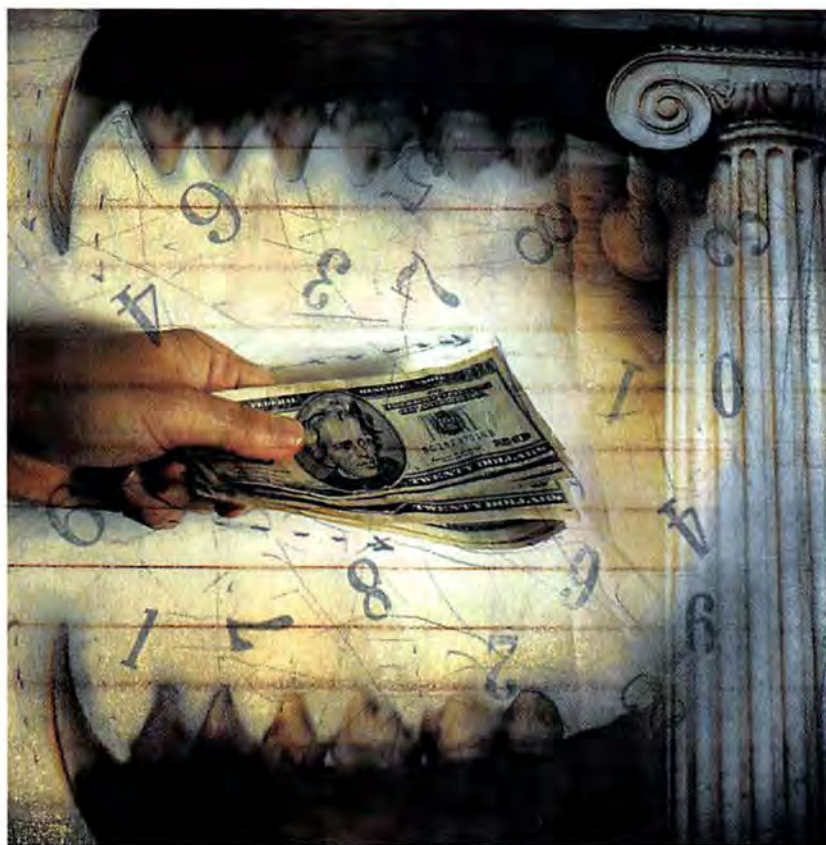
**CHOOSING AN
E-PAYMENT SERVICE**

**PRIVACY WATCH:
OPTING OUT**

**ON YOUR SIDE: SNAFU
WITH REFURBISHED PC**

Trusting Your Money to Strangers

Online payments are quick and easy, but what happens if there's a problem?



IT'S A GREAT IDEA, in theory: Send cash instantly over the Web. If you love online auctions, money-transfer services like PayPal and eBay's Billpoint mean you no longer have to take chances with money orders. And online bill-payment services like PayMyBills.com and StatusFactory save you from monthly writer's cramp.

But as users of e-payment services have discovered, if something goes wrong with a service that handles your money, you can suddenly feel very vulnerable.

Garth Gregson, a financial controller in Santa Cruz, California, opened a PayPal

(www.paypal.com) account when he won an auction for a notebook PC and wanted to pay the seller quickly.

PayPal verified his bank account without a hitch, but it could not verify his credit card. He tried another credit card and got the same error, but this time PayPal restricted his account, which meant he couldn't access it at all. "My credit cards were perfectly valid and my credit is good, so the whole situation made no sense," Gregson says. Unable to find a phone number for customer service on PayPal's Web site, he wrote an e-mail asking how

to lift the restrictions from his account.

After a frustrating round of unhelpful e-mail responses, Gregson got a customer service phone number. He called and the PayPal representative essentially told him that he was out of luck. "Once PayPal declines a credit card, it's declined forever—no questions asked or answered. I couldn't even close the account, since it had been restricted," Gregson says.

Gregson ended up sending the notebook seller a paper check, and PayPal eventually closed Gregson's account for him. PayPal officials won't comment directly on Gregson's case, but they say a credit card may be declined for many reasons—from the card issuer's address verification system being down to a customer's card having been frozen.

Gregson still bristles at the experience. "I was incredulous at [PayPal's] lack of customer service," he says. "I'm particularly bothered that I gave my financial information to a company that shows such indifference to its customers."

Unfortunately, it isn't terribly surprising to hear that a customer has received lousy service from a Web-based company. What sets PayPal and all other online bill-paying services apart is that they have access to your most sensitive financial information. And besides having your credit card and bank account numbers, they can take money directly from your checking account. When you can't get a straight answer from a company wielding that much power over your finances, you tend to get a little nervous.

Another example involves Jane Dwyer of Walden, New York. "I signed up with PayMyBills.com thinking it would do ►

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just that. But it didn't turn out that way." Dwyer says her bills got paid up to three weeks later than she expected.

Paymybills.com representative Laurel Cecilia asserts that the payments weren't truly late. Cecilia says PayMyBills doesn't take cash from a user's account until a payee actually cashes their check. That policy makes some users suspect their payments were made late, she says.

But Dwyer says that some companies charged her fees for late payments.

Confusing matters further, many electronic-payment services look and act like

banks—PayPal and its partners even offer ATM/debit cards, and a money market fund for accounts that hold a balance. But what looks and acts like a bank isn't always a bank. For instance, money kept in accounts at PayPal and other money-transfer services like Yahoo's PayDirect is not insured by the Federal Deposit Insurance Corporation, the agency that insures checking and savings accounts at banks.

Does that mean you should think twice about going online to pay your bills or to transfer money? Not necessarily. Chances are, you'll never have a problem. If ▶

PRIVACY WATCH

Opt Out to Protect Your Data

THIS SUMMER you probably received a fistful of privacy notices from the banks, brokerage houses, and insurance companies you do business with, online and off. The companies didn't suffer a simultaneous crisis of conscience, of course. They were required to send out these notices to comply with provisions of a federal law, the Gramm-Leach-Bliley Act.

The notices bulge with legalese such as "nonpublic personal information." But sorting through the gobbledygook is well worthwhile. By sending a well-crafted response (I'll give an example), you can clamp down on many of the companies that flood your e-mail in-box and your postal mailbox with annoying junk, or that call you with solicitations at the most inconvenient times.

Keep in mind that the new privacy laws do not err on the side of the consumer. If you don't respond to the privacy notices, the companies that send them are perfectly within their rights to continue selling your personal information to anyone.

But opting out is simple. Some companies include a reply form that you can use to restrict use of your personal information. Other companies post forms on their

Web sites. You need to send your own letter to companies that don't do either.

Here's how: Collect the Web and postal addresses you'll need. (If you no longer have the original notices, check the companies' Web sites or contact their customer service departments.)

The basic letter should read something like this (shorter is better):

"Re: Gramm-Leach-Bliley Privacy Opt-Out Notice

"To whom it may concern:

"This letter constitutes notice that I wish you to restrict the transfer, sale, trade, or barter of all information relating to my account(s) numbered [insert account numbers here] either to any subsidiary or to any nonaffiliated third-party business partner.

"Please also refrain from sending me marketing materials via postal mail and e-mail, and from soliciting me by telephone.

"My postal address is..., my telephone number is..., and my e-mail address is..."

Opting out is a chore. But done right, it will keep much of your personal information off the auction block and prevent some spam from reaching your in-box.

—Andrew Brandt



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you do, and your payment site is affiliated with a regulated financial institution—as the online bill-payment programs at most banks are—you'll be covered by the institution's own customer-protection policies, as well as by various state and federal consumer-protection laws.

ON YOUR SIDE

When They Send the Wrong PC

I BOUGHT a refurbished PC at Dell.com that was supposed to have an 866-MHz CPU, but it came with a 733-MHz processor instead. A Dell customer service representative told me that Dell's records showed I had ordered a 733-MHz machine. After I contacted the Texas Better Business Bureau, a second Dell rep called and acknowledged that I had been sent the wrong CPU. He promised that he would take care of it, but he never did.

Tom Perilstein, Seattle

But there are good reasons for caution in choosing and using an online payment service. I'll outline some of the concerns and then give you a few tips for picking a trustworthy bill-paying operation.

PayPal, which at press time said it had 10 million account holders, has struggled

with some sticky customer service problems since launching in October 1999. First it was broadsided by online-auction users, who opened accounts faster than the fledgling company could serve them.

Then the crooks moved in. "Online payment services are attractive targets to thieves with stolen credit card numbers," says Vince Sollitto, PayPal vice president of corporate communications. "Typically these fraudsters operate by setting up accounts using stolen numbers, sending payments to other accounts [they control], and withdrawing the money."

In an aggressive effort to control fraud on the site, PayPal administrators froze access to many accounts that they suspected were linked to fraudulent transactions. As a result, lots of legitimate PayPal users found themselves suddenly locked out of their accounts. Naturally they were furious, especially when they received only canned e-mail responses to their queries. "PayPal effectively held my ▶

PC World responds: When you order anything on the Web, keep a record of the transaction, including specifics about the product. Print the order confirmation page and the pages describing the item and the return policy. Perilstein's problem apparently stemmed from a miscommunication between Perilstein and a Dell phone sales rep, Dell spokesperson Bryant Hilton says. Dell offered Perilstein a credit toward a new PC plus free overnight shipping, a solution he's satisfied with. —Grace Aquino

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money hostage, and I couldn't do a thing about it," writes one former PayPal user, who asked not to be named.

PayPal has all but eliminated fraudulent transactions and has improved detection of possible cases, Sollitto says. "As we've gotten more sophisticated in our [anti-fraud] efforts, we've been able to substitute a scalpel for the meat cleaver," he says.

PayPal isn't the only e-payment site

that's stirred up customer dissatisfaction, of course. I've received complaints from users of most major online payment sites regarding late payments, errors in payment amounts, unresponsive customer service, poor-quality documentation, and confusing customer policies.

So if no e-payment site is problem-free, how do you know which to choose? Here are some points to keep in mind:

Stability: Since consumer-protection laws covering e-payment sites are shaky, you want a service that won't disappear.

"Look for a site sponsored, owned, or endorsed by a regulated financial institution or credit card company, or by a recognized Fortune 500 company," advises attorney Mike Nugent, who heads the New York law firm Heller Ehrman's financial technologies group. Paul Jamieson, director of banking and payment services at research firm Gomez, agrees. "There's always less risk in going with a trusted brand. Also, be sure to read the fine print. It can be tough to slog through all those terms and conditions, but you need to know your rights before you sign on."

The site should post physical addresses, phone numbers, and names of principals. Find out how long the site has been in business, and research the company's history at the Better Business Bureau Online (www.bbbonline.com).

Customer service: Ideally the site will offer 24-hour, seven-day toll-free telephone support. If it doesn't, e-mail a test question, and see whether you get a quick and accurate reply.

Security: Make sure the site uses 128-bit encryption; and don't divulge any information that's not absolutely required.

Fraud prevention: Some payment sites provide free insurance coverage and/or fraud-protection policies, but in the end most make no promises. Keep in mind that when you charge a purchase or payment to your credit card using an e-payment site, your credit card company may or may not pick up the tab if the purchase goes awry. I've heard from consumers who have had both experiences.

Customer feedback: Check out comments at sites like Epinions.com, EComplaints.com, and PlanetFeedback.com.

An online payment site can make paying bills more convenient. Just be sure that the service you choose will be there for you if something goes wrong. After all, your money is on the line. ■

Anne Kandra is a contributing editor, Grace Aquino an associate editor, and Andrew Brandt a senior associate editor for PC World.

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Why the rampant consumerism? Those companies will give me money to help send my boys to college. And they're not alone. I now eat at the neighborhood deli, use AT&T for long distance, and buy gas at ExxonMobil stations. I may even ask Coldwell Banker to sell my condo.

All those businesses are coughing up cash toward my kids' education because they're partners of UPromise (www.upromise.com), a terrific new free Web-based service that could end up being to college savings what the 401(k) account is to retirement savings.

UPromise sprang from an altruistic idea. Founder Michael Bronner, a successful Web entrepreneur, wanted to help kids get to college. He knew that saving for college is hard on parents, so he created a way to do it without really trying.

Enter UPromise. To set up an account, you give the site personal information, such as your phone and credit card num-

bers, so it can track your spending and credit your account. (You can register any credit card in your wallet, or all of them; the company says it won't share your personal data or use it for marketing purposes.) The UPromise site also serves as a starting point to reach 70 online stores that participate in the program. You can even invite family and friends to join your network so that part of their spending goes toward your children's education.

So what kind of money are we talking about? A dollar here and there, mostly—you get a rebate of between 1 and 15 percent of the cost of your purchases. You do need to be patient: I've found that money is usually credited promptly, but it takes a few weeks in some instances. And when I ordered some mail-order steaks, my rebate didn't show up until I e-mailed UPromise customer service.

Tools on UPromise's site estimate how much the service can help you save, based on your spending and your kids' ages. Assuming the service sticks around, you could easily pay for textbooks; with your friends and family chipping in, you might save tens of thousands of dollars.



Altruistic origins aside, UPromise is a business: Merchants pay it a finder's fee for steering customers their way. But my money won't vanish if it becomes another Web casualty—accounts are insured by the Securities Investor Protection Corporation. And I'm betting that the company will succeed. The list of participating merchants is already impressive. So is UPromise's board of directors, which includes former U.S. Senator Bill Bradley. In addition, you periodically roll money out of your UPromise account and into a state-sponsored Section 529 college-savings account. (For more on these plans' rules, benefits, and tax implications, visit www.savingforcollege.com.)

For now, UPromise really does offer free money for college. In the five months I've been a member, I've received \$250 from participating companies. And more merchants are joining in. By the time you read this, my boys will be eating McDonald's Happy Meals and pocketing more money for their future. ■

Contact PC World Contributing Editor Brad Grimes at websavvy@pcworld.com.

GIMME FIVE

Best Sites for Broadband Advice

1. **SpeedGuide.net:** A great site for tips and patches that can make your cable or DSL connection faster and more stable. www.speedguide.net
2. **Broadband Wizard:** This \$20 downloadable utility monitors and optimizes your connection; a 15-day trial version is free. www.broadbandwizard.net
3. **Cable-Modems.Org:** Everything from tutorials to Registry tweaks, plus advice

- on testing your cable modem's speed and security. www.cable-modems.org
4. **DSL Reports:** DSL and other broadband news, reviews, and facts; type in your zip code to get consumer feedback on local providers. www.dslreports.com
5. **GetConnected.com:** Check out this e-commerce site for details on cable and DSL plans, as well as special deals and shopping advice. www.getconnected.com

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Sony's new VPL-CS3 ultra-light (5lbs., 5oz.) Micro-portable Projector will make a weighty impression the moment you set it down. After your audience finishes admiring its innovative design with a stereo speaker panel that doubles as a lens cover, they'll marvel at the bright (700 ANSI Lumens*) picture and SVGA

resolution (800 x 600) delivered by its three 0.7" LCD panels. (Also available is the VPL-CX2 with 750 ANSI Lumens and true XGA resolution.) The VPL-CS3 is supplied with 4X digital zoom, digital keystone correction, remote control and custom carrying case. With all these features, insist on a Sony Micro-portable Projector. And make business a pleasure.

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A Counterespionage Guide to Spyware

Spyware. The very word makes me shudder. At home, Web sites can relay details of your PC habits and Internet escapades to who-knows-who. At work, software can record everything you type and report to your boss on which programs you use, as well as when and how you use them.

Feeling paranoid? Well, even if you aren't concerned about a snoopy spouse or a meddling manager, you need to know how these programs work and how to defeat them, if only to spot potential threats to your privacy. I've donned my trench coat and dark glasses to tell you about a few of the tools and strategies I use to watch (and foil) the watchers.

PC EAVESDROPPERS

ADWARE PROGRAMS, such as GoZilla, are freeware utilities that display banner ads to generate revenue. GoZilla manages your file downloads, but it also uses a small applet that interacts with the company's servers behind your back. The applet sends you new ads, and it tracks the ads you've seen, clicked, and viewed. While the data collected is anonymous, you wouldn't know it unless you read the vendor's 2500-word privacy policy. One cure is LavaSoft's AdAware, a free tool



Is your software tracking you? Want to know how to fight back?

that scans your hard drive and removes these hidden applets. Visit find.pcworld.com/12220 for a download of AdAware, as well as full or trial versions of other utilities I describe here.

ZoneAlarm, a freeware firewall from Zone Labs, alerts me when any program attempts to send or receive data, and it allows me to block or approve each attempt. For an intricate, real-time view of what the programs are transmitting—and who's sending and receiving the data—I rely on Tamosoft's \$50 CommView.

Keystroke-recording programs are also spyware. An ad for SpectorSoft's \$70 EBlaster 2 says it "automatically records everything your spouse, kids, employees, and consultants do online"—in secret, of course. EBlaster will send a snoop e-mail reports of all your Internet activity, including chat room conversations, instant messages, e-mail, and Web site visits.

CommView

★★★★☆

\$50; Tamosoft, www.tamosoft.com

Don't Panic 4

★★★★☆

\$20; Panicware, www.panicware.com

EBlaster 2

★★☆☆☆

\$70; SpectorSoft, www.spectorsoft.com

Invisible Folders

★★★★☆

\$20; Kissco, www.invisiblefolders.com

EYES ON THE SPIES

IF YOUR EMPLOYEES spend half their workdays surfing the Web and e-mailing jokes to their friends, spyware may be justifiable. But I'm not on anybody's payroll, so I'm going to pass along a few tricks to help you determine whether snoopware is on your PC. First, for a quick check on just what is running on your computer, press **<Ctrl>-<Alt>-<Delete>** simultaneously. A dialog box will list all currently running programs. Look for programs that contain suspicious or unfamiliar names. For help deciphering these names, see the November 2000 *Answer Line*, "Identify Mystery Apps Running in the Shadows" (find.pcworld.com/10660).

Want to stop something from loading when your PC boots? In Windows 98 and Me, select **Start>Run**, type **msconfig**, press **<Enter>**, and choose the **Startup** tab to see a list of the programs that start when Windows loads. Uncheck any that seem to be spyware. Windows 95 and Windows 2000 lack the Msconfig utility, so use Startup Control Panel, a freeware utility, instead.

Kissco's \$20 Invisible Folders is a nonsense tool that hides folders from snoopware and from prying eyes, either when you press a hot-key or automatically after a set time. Panicware's Don't Panic 4, also \$20, clears nearly all traces of your PC activity, including drop-down URL history listings, the Clipboard, and IE's AutoComplete and passwords.

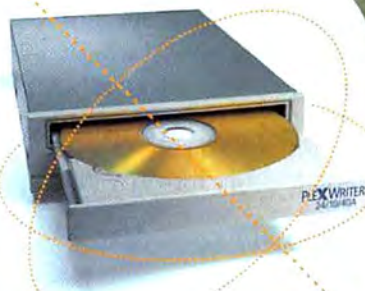
I would tell you more, but it's tough to type in this trench coat. I'll cover spyware blockers in more detail in a future Home Office newsletter, so sign up soon at www.pcworld.com/bass_letter. ■

PC World Contributing Editor Steve Bass runs the Pasadena IBM Users Group. He can be reached at steve_bass@pcworld.com.

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So is it any wonder people are burning to drive the PlexWriter 24/10/40A. See what it can do for you.



PlexWriter 16/10/40A
July 2001



PlexWriter 12/10/32A
September 2000



PlexWriter 16/10/40A
June 2001



PlexWriter 12/10/32A
August 2000



PlexWriter 12/10/32A
November 2000



STUART J. JOHNSTON

Security Scares With Microsoft Outlook



YOU'D LIKE to think that as some of the latest products offer you more control, you don't end up giving control away to someone else. Well, in the case of Microsoft Outlook 98, 2000, or 2002 (the version that ships with Office XP), the latest security threat opens up just that possibility.

The issue involves a new feature called View Control that uses ActiveX. View Control displays information from Outlook in a browser window, and it ships with Outlook 2002 in Office XP. But the feature also works with Outlook 98 and 2000—a fact, it turns out, that a malicious hacker can exploit, whether you have loaded View Control or not.

Bug expert Georgi Guninski discovered that a miscreant

can construct a Web page or an HTML e-mail that embeds

View Control. If you then click the control, the hacker can take over your system and delete files. Even if your PC does not have the View Control feature, once you click the control on a Web page, the program tries to download itself to your PC. However,

you do receive a prompt alerting you to the download first.

Microsoft has acknowledged the flaw and says it is working on a patch to plug the hole. Until the fix appears, you can work around the vulnerability by stopping ActiveX controls from running. Check out the Microsoft posting at find.pcworld.com/11666 to learn how to disable the controls.

SIRCAM NOT OVER YET

DO YOU remember the SirCam worm attack? This nasty piece of code replicated via e-mail. Once activated, SirCam randomly selected a document from a victim's computer, attached the document to an e-mail message, and mass-mailed itself to everyone in the victim's address book.

You may not think that your system was infected at an earlier time because the worm didn't cause immediate damage, but you could be in for a nasty surprise on October 16.

If you've set your system to use the European date format (day/month/year), and your PC gets contaminated, you run a 1-in-20 chance that SirCam will delete all the files on your hard drive on that date.

Here's how to tell whether an e-mail message is infected: The body of the text message begins with the innocuous "Hi! How are you?" or with its Spanish equivalent, "Hola como estas?" But the dead giveaway is the attached file that shows a double extension on the end of its name. As the e-mail is sent off, the worm appends an extra extension (.bat, .com, .lnk, or .pif) to the name of the file it selected. So a tainted file would become named "filename.doc.com,"

for instance. One way to tell if your computer is already infected: You'll find a file named SCam32.exe in the Windows\System directory.

Protect your PC by getting the latest virus definition file from your antivirus company. McAfee and Symantec say that their programs—armed with any virus definition file dated July 17 or later—will detect the SirCam worm in an incoming e-mail message and alert you. Visit find.pcworld.com/11663 for McAfee's instructions on how to remove the worm; see find.pcworld.com/11664 for step-by-step advice from Symantec. ■

Stuart J. Johnston is a contributing editor for PC World.

IN BRIEF

Holey Windows Media Player

MICROSOFT has fixed another security hole in Windows Media Player, affecting versions 6.4, 7, and 7.1. The vulnerability centers on Windows Media Station (or .nsc) files, which allow the Player to deliver streaming media. A hacker could craft .nsc files to wreak havoc on your PC. Go to find.pcworld.com/12120 to get the patch.

Problem Fixes for Palm, Handspring

PALM COMPUTING has released version 3.5.3 of its operating system. The update corrects minor glitches that prevented a few third-party programs from running properly and caused some users to lose data. Go to find.pcworld.com/11667 to get the 19KB download.

Handspring says that a small number of Visor Prism and Visor Platinum owners have had similar problems with some third-party apps. If you upgraded to Palm OS version 3.5.2H1.4 and you've encountered this problem, you should revert to the previous OS, 3.5.2H1, rather than getting version 3.5.3. Hop to find.pcworld.com/11668 for a link to the older OS.

BUGGED?

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



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NEW PRODUCTS

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Laptops: Low-Cost to Luxury



LAPTOPS AT \$999 EACH:
Sony's petite VAIO PCG-SR33 (with short-term rebate), left, and Gateway's sturdy Solo 1200.

NOTEBOOKS

TEST Center DO YOU NEED a lightweight laptop that won't bust your budget? Have you finally decided to treat your best employees (or yourself) to a top-of-the-line, wireless-ready model? One of four new portables that we tested—Gateway's **Solo 1200**, Hewlett-Packard's **Pavilion N5470** and **Omnibook 6100**, and Sony's **VAIO PCG-SR33**—just might fit the bill.

First up: Sony's new VAIO PCG-SR33, a laptop with a

good \$1099 price tag (before a \$100 mail-in rebate). In our tests, the shipping SR33 lasted twice as long on one battery charge as most subnotebooks we've looked at: just over 3 hours, using the standard six-cell power pack.

The SR33, which weighs 4.7 pounds with peripherals, features a Celeron-600 processor, 128MB of RAM, S3 Savage/IX8 graphics with 8MB of memory, a 10.4-inch active-matrix screen, a 10GB hard drive, a built-in 56-kbps mo-

dem, Windows Millennium Edition, a touchpad, and a Jog Dial pointing control.

This notebook also has a built-in Memory Stick slot for sharing digital photos and music, as well as an I.Link (IEEE 1394) port for high-speed digital downloads. The generous software bundle includes Sony MovieShaker, PictureGear, Microsoft Word 2002, and Quicken 2001.

It earned a respectable PC WorldBench 2000 score of 107. Its small screen was crisp

and bright, but we found the 9-inch-wide keyboard too cramped to type on for long periods. The bundled 8X-16X CD-ROM drive uses the notebook's only PC Card slot, leaving one USB port for other peripherals, and it has no parallel port, ethernet port, or included floppy drive.

Gateway's new Solo 1200, \$999 without rebate, is perfect for students and for budget-conscious consumers seeking a rugged, full-featured all-in-one. Our preproduction unit came with a Celeron-750 CPU; Gateway now sells it with a Celeron-800 chip.

The Solo 1200 runs Windows ME and has a 12.1-inch active-matrix screen, 128MB

Solo 1200

Gateway

(Preproduction unit, not rated)

A great laptop for students and others on a tight budget, but it's heavy and the battery life is poor.

Street: \$999

find.pcworld.com/11921

VAIO PCG-SR33

Sony

★★★★☆

A well-priced dream come true for digital editors and photographers who rely on the 1394 port or Memory Sticks. List: \$1099 (\$999 after rebate)

find.pcworld.com/11920

62 NOTEBOOKS Gateway Solo 1200, HP Pavilion N5470, HP Omnibook 6100, Sony VAIO PCG-SR33

64 PERSONAL FINANCE Intuit Quicken 2002 Deluxe, Microsoft Money 2002 Deluxe

66 PDA MODULES Symbol Technologies Wireless Networker, Xircom SpringPort Wireless Ethernet Module, Xircom Wireless LAN Module

66 LAPTOP ACCESSORY Kensington FlyLight Notebook USB Light

68 PROJECTORS InFocus LP290, Lightware Legend LS-8

STORAGE Toshiba MK5002MPL 5GB hard disk drive

70 DIGITAL AUDIO Compaq IPaq Music Center

UTILITY Farstone Technology Virtual Drive 6.1

70 DIGITAL VOICE RECORDERS Olympus DM-1, DW-90

72 PDA CMC Magnetics CyberBoy **BACKUP SOFTWARE** Roxio GoBack 3 Deluxe

76 STORAGE QPS Que SuperDisk 240MB

78 TELEPHONY Mindmaker Tell A Phone

of RAM, S3 Twister graphics with 8MB of memory, a 10GB hard drive, built-in floppy and CD-ROM drives, modem and ethernet jacks, two USB ports, a parallel port, a monitor connection, and a touchpad. Microsoft Works Suite 2001 also comes bundled. The 1200 is chunky, with a case that measures 1.8 inches thick and weighs 7.4 pounds, including the AC adapter. And its battery life was a below-average 1 hour, 43 minutes in our tests. One beef: This laptop's keyboard seemed too springy.

FULL MEAL DEAL

IF YOU CAN afford a faster laptop that's packed with entertainment features, check out the HP Pavilion N5470, one of the first models available with AMD's new Mobile Athlon 4-1000 processor.

Our shipping unit came with Windows Me, 256MB of RAM, a 15-inch active-matrix screen, a 20GB hard drive, built-in floppy and DVD-

ROM/CD-RW drives, Trident CyberBlade-XP graphics with 8MB of memory, a 56-kbps modem, a network connection, and a touchpad. Bundled

This laptop is \$2199 (\$100 less if you catch a current rebate). Rich, full sound and well-designed audio controls on the front panel, which can

215 running Windows 2000; it was a full 15 percent faster than the average of five PIII-1000 systems that were similarly configured (except that they had 256KB L2 caches). In our tests, the batteries in our preproduction unit lasted an impressive 4 hours.

The 6100 includes 256MB of RAM, a 15-inch active-matrix screen, ATI Radeon Mobility graphics with 16MB of graphics memory, a 30GB hard drive, an 8X DVD-ROM drive, a network connection, a built-in 56-kbps modem and both touchpad and eraserhead pointing devices. It also carries a built-in 802.11b wireless networking adapter and an on/off button for its integrated antennas.

Penny pinchers or college students should head straight for Gateway's Solo 1200 or Sony's VAIO PCG-SR33; power users may want to check out the HP Pavilion N5470 or its upscale sibling, the 1.13-GHz Omnibook 6100.

—Carla Thornton ▶

FASTER, FULL-FEATURED

HP notebooks: Pavilion N5470, left, and Omnibook 6100.

software includes Microsoft Works 6—an older version of the basic productivity suite that doesn't include Word—and Microsoft Money 2001.

The N5470 is reasonably quick, although its PC World-Bench 2000 score of 149 is slightly below the average of two similarly configured Pentium III-1000/700 systems that have half the memory. It's a tad heavy at 8.5 pounds, including the AC adapter, but it turned in a good battery life of 3 hours, 11 minutes.

be used to play CDs when the notebook is turned off, make the N5470 the perfect portable for music lovers.

Finally, well-heeled professionals will appreciate HP's new \$3699 Omnibook 6100. This handsome, slender one-bay notebook uses Intel's new 1.13-GHz mobile Pentium III Processor-M, the fastest notebook chip on the planet. Aided by the PIII-M's 133-MHz bus and its 512KB secondary cache, the 6100 racked up a PC WorldBench 2000 score of



Pavilion N5470

Hewlett-Packard

★★★★☆

Enjoy this laptop's near-Pentium III-1000 performance, DVD-ROM/CD-RW drive, and generous entertainment features, all at a good price. List: \$2199

find.pcworld.com/12020

Omnibook 6100

Hewlett-Packard

(Preproduction unit, not rated)

The perfect portable for the pinstripe set, this elegant notebook offers performance and panache to spare. Street: \$3699

find.pcworld.com/11922

Finely Tuned Money-Management Programs

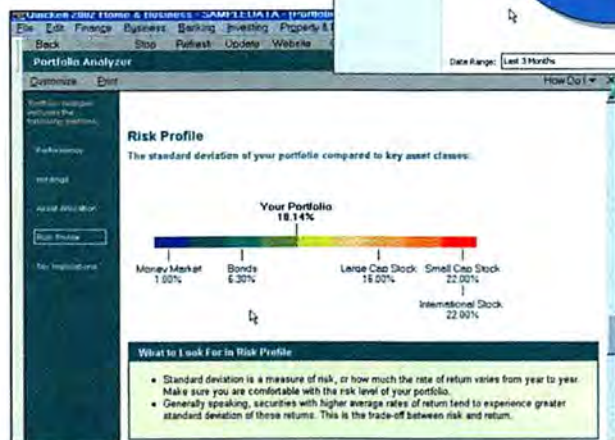
PERSONAL FINANCE

NEW VERSIONS of two highly popular money-management software programs—**Microsoft Money 2002 Deluxe** and **Intuit's Quicken 2002 Deluxe**—offer a handful of changes that enhance the apps' ease of use. They aren't, however, must-buy upgrades for owners of the 2001 editions. I looked at the beta 2002 versions of these veteran programs (Quicken is now in its seventeenth version, while Money is in its tenth). Both applications thoroughly cover almost every aspect of personal finance, including such areas as online banking, investing, budgeting, and tax planning.

EASY DOES IT

FOR EXAMPLE, consider how much time you spend on taxes alone. More than their previous versions, these programs help cut back on the drudgery. Improved online banking features in both programs expedite the electronic download and automatic categorization of your credit card, checking, and investment transactions, automatically matching most results to tax-form lines. They can also show what-if scenarios of different stock-sale combinations that would minimize capital gains; ferret out

tax deductions; and demonstrate how different financial choices affect your year-end obligation. In particular, with its 2002 edition, Money gains the kind of smooth data interchange with Kiplinger's Tax-Cut software that Quicken has always had with TurboTax, its sibling Intuit product. Using either program will help you



THE BUDGET planner in Microsoft Money 2002 Deluxe, above, has more customization options and views than its predecessor. In the newest version of Intuit's Quicken software, a bevy of familiar calculators and wizards are assembled on one page for easy use.

spend less time on tax chores.

Money and Quicken's budgeting and portfolio managers have gotten a similar touch-up. Now Quicken's capital gains estimator, asset allocator, and other relevant tools are on a single page called the Portfolio Analyzer. Likewise, budgeting tools are collected on a single page and offer a lot more helpful instruction—perhaps too much of it. Many Quicken pages are getting

awfully busy-looking. Money achieves enhanced usability by beefing up Advisor FYI, its ever-present intelligent wizard. It pops up here and there as needed, to warn you of a looming cash-flow problem or to suggest an investment strategy, for example.

The only truly innovative addition in Money 2002 is MoneySide, a browsing companion that's sort of a Web version of Advisor FYI. It chimes in whenever it thinks you need a credit card number, a can-I-afford-that calculation, or a little how-to investment advice.

But to use MoneySide and certain other new features, you must assemble the IDs and passwords to all the online financial accounts that you care to have interact with

Microsoft Money 2002 under Microsoft's new Passport system (which would let you type in only one user ID and password, admittedly a timesaver). You may want to think twice, however, about concentrating access to so much of your personal and financial information under one lock and key on a Microsoft server.

The bottom line: I simply can't imagine getting along without one of these money managers. If you don't already own one of these programs, however, I suggest purchasing Intuit Quicken 2002 because it is not as adamant about knowing your personal financial information as Microsoft Money 2002 is. In my opinion, though, there is not really enough new in either package to compel users of previous versions to upgrade.

—Mike Hogan ►

Microsoft Money 2002 Deluxe

Microsoft

(Beta software, not rated)

A good advanced money manager; some functions are curtailed if you don't use Microsoft's Passport access feature. List: \$65

find.pcworld.com/11981

Quicken 2002 Deluxe

Intuit

(Beta software, not rated)

A must-have for anyone who lacks such a program but wants to manage their money. This version contains too few new features to make upgrading worthwhile, however. List: \$60

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Other APC products for the VoIP/Rack environment:

- **KVM Switches** provide one centralized control point for up to 64 servers.
- **ProtectNet** rack-mounted data-line protection.
- **PowerNet Manager** collects UPS/power status information for fast problem diagnosis
- **Cable Interface Kits** provide direct communication between UPSs and desktops, workstations and servers.
- **2-Post Racks / 4-Post Open Frame Racks**



APC was named to the 2000 InformationWeek 500 ranking of the top IT innovators (09/11/00).



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Toss Your PDA Cables



WIRELESS HANDHELD OPTIONS: From left, Symbol Technologies' Wireless Network on a Compaq IPaq, Xircom's Wireless LAN Module on a Palm M500, and Xircom's SpringPort Wireless Ethernet Module on a Handspring Visor.

PDA MODULES

USING A wireless network has obvious benefits: You can browse the Web and send e-mail without worrying about cables. Now PDA users can enjoy such advantages, thanks to new adapters for Palm, Handspring, and Pocket PC PDAs that use the 802.11b wireless ethernet protocol.

I tested shipping versions of the Xircom **Wireless LAN Module** for the Palm M500 and the Xircom **SpringPort Wireless Ethernet Module** for Handspring Visor PDAs, both \$299, as well as a preproduction unit of Symbol Technologies' \$179 **Wireless Networker** on a Compaq IPaq with the optional CompactFlash sleeve.

The two Xircom devices are bulky: The SpringPort adds a large hump to the Visor; the Wireless LAN Module is of the same size and weight as the Palm M500 itself (somewhat defeating the point of such a sleek handheld).

By comparison, Symbol's Wireless Networker adapter is

only slightly bigger than a CompactFlash memory card.

Testing in a typical office environment, I found that the devices could connect up to about 90 feet away from the access point—the same range other 802.11b devices have—and worked well on various access points (which provide a bridge between the wireless network and the wired one).

Besides managing e-mail and Web browsing with it, you can use the connection to sync your PDA with a computer on the local network, but you can't sync over the Internet. The devices also allow roaming between different access points (if the network sup-

ports the capability).

The Xircom devices include built-in batteries and recharge at the same time as the PDA does, through the cradle. But the charge runs down faster for the adapters than for the PDAs: In my tests, both lasted around 2 to 3 hours with moderate use. The Symbol Wireless Network draws its charge from the battery of the PDA, bumping down the battery life of the IPaq from its usual 4 to 6 hours to a much skimpier 3 hours or so. Adapters that use the 802.11b standard can

send and receive data at up to 11 mbps. Handhelds lack the processing power to match that speed, so everything is much slower than on a PC. Web browsing on the IPaq or on any PDA using the Palm OS is frustratingly slow. Nor are the devices cheap. The Xircom units cost about as much as the PDAs they attach to.

Sending e-mail directly from a PDA without having to sync is useful. In addition, going wireless could bring a new dimension to instant messaging and make life easier for heavy PDA users, if the cost and/or the weight of a module is worth it to you.

—Richard Baguley ▶

QUICK TAKES

Little Laptop Light

Kensington's **FlyLight Notebook USB Light** is a nifty little glowworm mounted on a 18-inch flexible wand. In my tests, this featherweight laptop lamp was great for dimly lit meetings, darkened airplanes, and even working in bed, giving just enough light to see the keys. It might also be a suitable gift for a laptop-toting college-bound student. There are no moving parts—not even an on/off switch. Just slip the FlyLight's tail into your notebook computer's USB port, and its LED-powered head emits a focused 0.1-watt beam of bluish light. It's a



power miser too, requiring just 90 seconds per hour of a laptop battery's charge. The light's estimated lifetime is 100,000 hours, with a five-year warranty. The device's street price is \$20. Kensington, find.pcworld.com/11982, 800/235-6708.

—Frank Thorsberg

Wireless Networker

Symbol Technologies

★★★★☆

This light and easy-to-use adapter adds wireless networking to a Pocket PC, but for most users this addition won't overcome the price.

List: \$179

find.pcworld.com/11985

SpringPort Wireless Ethernet Module

Xircom

★★★☆☆

Allows Handspring Visor users to sync their PDAs and use the Internet without cables, but it's of limited use to most people.

Street: \$299

find.pcworld.com/11984

Wireless LAN Module

Xircom

★★★★☆

If you need it, this module brings the advantages of wireless networking to the Palm M500, but it adds substantial bulk and comes with a steep price tag.

Street: \$299

find.pcworld.com/12680

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Affordable Projectors for Home or Office



GOT POPCORN? The economical price of Lightware's Legend LS-8 makes this model a good choice for home theater budgets.

PROJECTORS

BUYING A portable data projector to show slides at a business meeting or to watch a large-screen movie used to be a very expensive proposition. But two new units, the **LP290** from InFocus and Lightware's **Legend LS-8** bring the cost of mobile presentations down



THE INFOCUS LP290 offers bright, colorful screens.

without sacrificing picture quality (other reviews and more information on using data projectors as home theater equipment may be found at find.pcworld.com/12580).

The InFocus LP290 offers rich, color-saturated images for small to medium-size con-

ference rooms at a competitive price. This 5.7-pound LCD unit provides a native XGA (1024 by 768) resolution that matches the typical resolution of the large-screen notebook PCs that it has been designed to accompany.

Delivering light output rated at 1100 ANSI lumens (the ANSI lumens rating describes relative brightness), the LP290 includes both a zoom lens and a remote for controlling the projector and the PC.

Best of all, the estimated street price of the LP290 is \$3499, which is about \$1400 less than competing LCD projectors, such as the 6-pound Epson PowerLite 715c, whose estimated street price is \$4879. (Note that the Epson projector's 1200 ANSI lumens rating does indicate that it is slightly brighter.)

Economy-minded buyers who want an even lighter projector and can get by with SVGA (800 by 600) resolution—which is common for

many older laptops—may prefer the Legend LS-8. This ultralight Digital Light Processing unit weighs only 3 pounds, and it features 800 ANSI lumens light output (enough for small- to medium-group presentations), as well as a standard remote for projector and PC control. And it costs just \$1795—less than half the cost of such similarly designed 3-pound models as Plus's \$3995 U3-880. The LS-8 is the first 3-pound projector to drop below \$2000, and you don't have to give up any features for that price.

EASY SETUP

I TESTED SHIPPING versions of both projectors and found each of them easy to set up and use with a laptop computer for displaying either PowerPoint presentations or cable-TV source images.

The LP290, however, produced a brighter, more color-saturated picture; images from PowerPoint slides and TV commercials displayed warmer, more vivid colors and crisper details than did images shown on the LS-8.

The LS-8's fixed-focus lens also required me to set it up at a specific distance to fill the screen, which was less convenient than using the InFocus projector's zoom lens.

Lightware's economical and compact LS-8 may be just the ticket for delivering both business presentations and home theater entertainment if your budget is limited. If you need more flexibility and precision, however, the InFocus LP290 is worth a look.

—Richard Jantz ►

QUICK TAKES

Big Storage, Tiny Package

WHAT STORES 5GB of data, weighs just 1.94 ounces, and fits in a Type II PC Card slot? Toshiba's credit card-size **MK5002MPL** hard disk drive. Notebook users take note: Salespeople can easily transport bulky presentations without adding weight to their load; and music and media buffs can store nearly eight CD-ROMs worth of MP3s, movies, and pictures.

I tested a shipping version of the MK5002MPL on two different portables: an IBM X20 and a Sony VAIO 505TX, both of them running the Windows 98 operating system. Installation went relatively smoothly: Each laptop found the MK5002MPL immediately, but the X20 did not assign a letter for the



drive until I updated its drivers. I found that I could transfer 1.6GB of music files from my IBM's hard drive to the device in about 30 minutes.

At \$399, the MK5002MPL could be a bit pricey for most consumers, but it is a viable storage option for businesspeople on the go. Toshiba, find.pcworld.com/11986, 949/457-0777

—Mariaelena Robles

InFocus LP290

InFocus

★★★★☆

Well priced if you need this quality of projector; shows images bright enough to please most small to medium-size audiences.

Street: \$3499

find.pcworld.com/11924

Legend LS-8

Lightware

★★★★☆

This ultralight projector performs well in a small group or home theater setting—at a great price—but it has a fixed-focus lens.

Street: \$1795

find.pcworld.com/11923



Sends documents straight to the Web.

Self-diagnoses problems and helps you (or whomever you want) fix them.

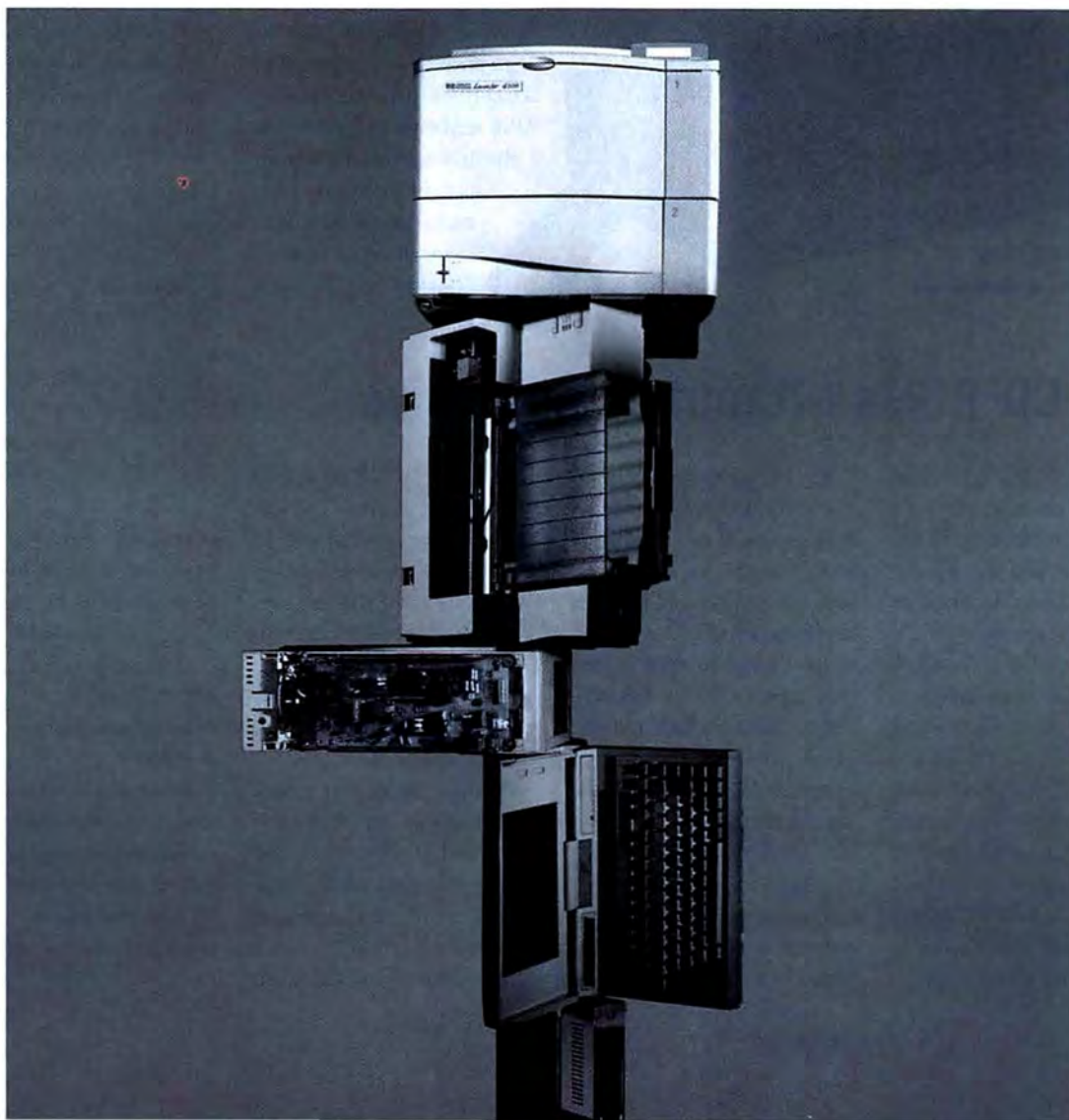
Monitors supplies with hp smartprint supplies and notifies users when attention is needed.

Unstresses IT managers.

Uninhibited by the name Printer.

The new evolved printers from hp.

So evolved, it feels weird to still call them printers.



Find Your Musical Center

DIGITAL AUDIO

WHEN YOU own more than 500 music CDs, a little disorder can become chaos. Compaq's **IPaq Music Center** is an appealing fix: All your music lives digitally on its hard drive, so you can access any track with the click of a button—either on the remote control or the unit's front panel.

Organizing up to 5000 songs doesn't come cheap: The Music Center is \$800—about twice as much as a typical 400-CD jukebox. Still, for a first iteration, this shipping unit is a well-thought-out consumer device. You connect it

to a TV to see setup screens, playlists, songs, and album covers. Playlist info also displays on the unit's LCD panel.

Copying music is easy—just insert a CD, press the Record button on the remote twice, select individual tracks or the entire CD, and go. In my tests,

IPaq Music Center

Compaq

★★★★☆

Device offers an easy way to digitize, organize, and play music from a large audio-CD collection, but it's pricey and lacks a CD-RW drive. List: \$800

find.pcworld.com/11826



THE IPAQ Music Center is about as large as a DVD player.

generating 128-kbps MP3 copies of all the tracks on a typical CD took 7 to 10 minutes, and I generally found the sound quality to be good.

The unit connected to my ISP via a built-in 56-kbps modem; it then accessed Gracenote's CDDb, an online CD database, and imported the track and title information for each album (it did have trouble with non-English characters such as accent marks). This import feature doesn't work with America Online or free ISPs, but it does work with Home PNA networking. The most tedious part is using the cramped buttons on the unit's remote control to enter your text information.

There's a lot to like about the IPaq Music Center. But its high price, as well as its lack of a CD-RW drive and a bundled USB keyboard (which would eliminate having to enter data through the remote), makes me want to wait for the next version.

—Melissa J. Perenson

QUICK TAKES

New Recorders Let You Dictate, Dance

If you prefer to talk your way through to-do items, proposals, and e-mail, the new **Olympus DM-1 Digital Voice Recorder** may help. The elegant shipping model that I looked at weighed a mere 3.1 ounces, including its batteries.



After you have recorded your vocal ramblings (the recorder can hold up to 22 hours of speech), you can save the file to your computer. The device doubles as a good-sounding MP3 music player, too. But with a street price of \$299, the DM-1 is expensive. If you can live without music playback, consider the \$99 **DW-90**, an affordable but very basic option that Olympus (www.olympusamerica.com) says can log up to 90 minutes of recorded speech.

—Aoife McEvoy

Play CD-ROMs Without Using a Drive

UTILITY

IF YOU'VE ever waited for a CD-ROM to catch up to the action while you play a game on your PC, you'll appreciate Farstone Technology's CD emulator, **Virtual Drive 6.1**. A CD emulator copies data from a CD to a virtual CD-ROM drive on your hard drive and then plays the data back, making the CD-ROM unnecessary and game play much quicker. This is handy if you travel: You can have your CD-ROMs available without having to tote the actual discs.

Virtual Drive works in all flavors of Windows except 3.1 and costs \$40 downloaded (I saw a shipping version). It creates up to 23 virtual CD drives on your computer and assigns a drive letter to each. When you copy a CD, the software creates a virtual CD, and you "load" and "eject" it via the program's Virtual Drive Manager. A virtual CD can contain any kind of data, including music files and databases.

You'll need plenty of space on your hard drive for Virtual Drive, as a virtual CD can eas-

ily take up 1GB. And not all CDs can be copied. Though the software worked well in Windows 98, on a PC running Windows 2000 it had problems with Microsoft's Combat Flight Simulator 2—the game wouldn't start because of the copy protection encoded on the original discs.

Farstone claims that Virtual Drive can give you an effective CD speed of up to 200X, and in my informal tests, game play was indeed a great deal smoother. Virtual Drive 6.1 isn't essential software, but

it's worth your attention if your aim is convenience or better game performance.

—Ramon G. McLeod

Virtual Drive 6.1

Farstone Technology

★★★★☆

Works well as a CD emulator and is handy for gamers and travelers because you don't need to carry the original CD-ROMs, but it is not must-have software.

List: \$40 for download version

find.pcworld.com/11840

The new evolved printers from hp.



hp LaserJet 1220:

best choice for personal results | one-click color document image sending via e-mail | convert documents to digital with edit, store and manage abilities | send color images and documents to the web



hp LaserJet 2200:

optimum versatility for small work groups | includes web-enabled remote and print management | infrared port for wireless printing from mobile devices such as cell phones and PDAs



hp LaserJet 3200:

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hp LaserJet 4100:

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hp LaserJet 9000:

sets a new performance standard in its class | includes web-enabled remote and print management | ideal for high-volume transaction printing applications

for more information on which printer best suits your office needs,
please visit www.hp.com/go/printers-us

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CyberBoy: The Multitalented Handheld

P D A

PACK A personal digital assistant, a digital camera, an MP3 player, an FM radio, and a voice recorder into one device, and you get CMC Magnetics' **CyberBoy**. This sleek—albeit slightly chintzy—handheld offers fun and useful tools for gadget fanatics.

You can download MP3s from a PC via a USB connection, and store them in the CyberBoy's 8MB flash memo-

ry or in an optional SmartMedia card that inserts into the device's external memory slot. (I'd recommend buying at least a 32MB SmartMedia card, which is about \$30.) The CyberBoy also comes with 8MB of SDRAM.

Navigating the on-screen controls is relatively easy, and the playback quality of MP3s is quite nice, but I found radio reception to be inconsistent.

The built-in digital camera takes color photos at up to 640 by 480 resolution—adequate for Web posting. However, framing shots on the poor-quality, gray-scale screen was difficult. When the CyberBoy is attached to a PC, it can serve as a bare-bones Webcam that

can capture still photos and videos.

The CyberBoy includes a to-do list, an address book, a calculator, a memo pad, and a calendar. You can enter data through the on-screen keypad or by using a proprietary handwriting recognition function (I found my shipping unit's directions for this feature difficult to follow). You also can sync data between the device and a PC. Note: The CyberBoy has its own operating system, so you can't use software written for more-mainstream PDAs.

At \$349, the CyberBoy is pricey, but still a decent five-



FROM THE front, the CyberBoy looks like any PDA. Its digital camera lens is on the back.

in-one handheld, especially for younger people who may make more use of its fun features. By comparison, a Handspring Visor Deluxe PDA with a digital camera and an MP3 module costs almost \$600. But that has better software and more PDA functions.

—Grace Aquino

CyberBoy

CMC Magnetics

★★★★☆

Despite all its cool multimedia tools, it still costs too much.

List: \$349

find.pcworld.com/11841

Accident Insurance for PC Users With Roxio's GoBack

BACKUP SOFTWARE

SOFTWARE THAT protects you from yourself: How many utilities promise that? By backing up changes to your hard drive in real time, Roxio's \$50 **GoBack 3 Deluxe** can restore your drive to virtually any recent state, whether the damage is a destroyed report or an unsta-

ble system caused by a virus attack or a software installation.

I used my shipping copy of GoBack on a PC with a 650-MHz Athlon processor, 64MB of RAM, and Windows 98 SE. Compatible with Windows 9x, Me, NT 4, and 2000, GoBack runs in the background and requires no intervention, but

it does require at least 32MB of hard drive space. It uses 10 percent of your hard drive at installation (you can adjust the program's size, but Roxio says that choosing 10 percent lets the average user return a drive to a state two weeks in the past). Launching the program from the system tray and choosing a Safe Point restores your hard drive to an earlier configuration. GoBack keeps a comprehensive log to use if you're unsure of the exact point when things went wrong. You may also restore files individually without disturbing other changes.

GoBack works exceedingly well for everyday computing tasks, and on a 500-MHz or better system you probably won't notice a performance

hit. But if you perform heavy-duty graphics, audio, or video work, you will notice a slowdown, and such files quickly overwhelm GoBack's undo cache. Also, the software is incompatible with third-party boot managers like System Commander, and it is no substitute for backing up. For ordinary data accidents, however, GoBack could be just what the doctor ordered.

—Jon L. Jacobi

GoBack 3 Deluxe

Roxio

★★★★☆

This software is a great safety net for everyday computing tasks, though it degrades the performance of slower systems.

List: \$50

find.pcworld.com/11560

| GoBack Drive - Drives C: and D: | | | |
|---------------------------------|-------------|--|------|
| File | Size | Time | Path |
| System Start | 10:12:00 AM | C:\Program Files\Roxio\GoBack\GEMenu.exe | |
| System Safe Point | 10:12:07 AM | C:\Windows\System.dat | |
| File Modified | 10:12:26 AM | C:\Windows\Desktop\2001 Ink to C:\Recycled\ink | |
| File Created | 10:12:26 AM | C:\Program Files\Accessories\INTERNET\IE5 | |
| System Safe Point | 10:12:36 AM | C:\Windows\System.dat | |
| File Modified | 10:12:36 AM | C:\Windows\System.dat | |
| Process Start | 10:12:41 AM | C:\Windows\System.dat | |
| System Safe Point | 10:12:57 AM | C:\Windows\System.dat | |
| File Modified | 10:12:57 AM | C:\Windows\System.dat | |
| System Safe Point | 10:13:11 AM | C:\My Documents\GoBack1.bkp (new) | |
| File Created | 10:13:11 AM | C:\My Documents\GoBack1.bkp (new) | |
| File Created | 10:13:13 AM | C:\Windows\Recent\GoBack1.bkp | |
| Process Start | 10:13:10 AM | C:\PROGRAM FILES\ROXIO\GOBACK\GEMENU.exe | |
| System Safe Point | 10:13:26 AM | C:\Windows\System.dat | |
| File Modified | 10:13:26 AM | C:\Program Files\Roxio\GoBack\GEMenu.exe | |

A COMPREHENSIVE log displays the GoBack Safe Points.

2.0GHz.
my friends
are envious.
my enemies
are scared.



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- 3D Positional Sound with Wavetable
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- Internal 56K Capable* FaxModem
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- Upgrade to 8X CD-RW Drive, add \$120

DELL™ INSPIRON™ 4000

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- 192MB 100MHz SDRAM
- 20GB* Ultra ATA Hard Drive
- Modular 8X Max DVD-ROM Drive
- 8MB AGP 2X ATI Rage Mobility 128™ 3D Video
- 3D Positional Sound with Wavetable
- 26.5 Whr Li-Ion Battery with ExpressCharge™ Technology
- Internal 56K Capable* FaxModem
- MS® Works Suite 2001
- MS® Windows® Me
- 1-Yr Mail-in Service, 1-Yr 24x7 Phone Support
- 6 Months DellNet™ by MSN® Internet Access™

\$1829 or as low as **\$55** per mo. 45 mos.†

No payments for 90 days.† E-VALUE Code: 00039-800918m

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- Add a Notebook Surge Protector, add \$29

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- 3D Positional Sound with Wavetable
- 59Whr Li-Ion Battery w/ExpressCharge™ Technology
- Internal 56K Capable* FaxModem
- MS® Works Suite 2001
- MS® Windows® Me
- 1-Yr Limited Warranty,* 1-Yr Mail-in Service
- 1-Yr 24x7 Phone Support
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No payments for 90 days.† E-VALUE Code: 00039-800924m

- Upgrade to 2nd Bay 8X CD-RW Drive, add \$179
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Invigorate Old Floppies

STORAGE
IF YOU'D like to use those 3.5-inch floppy disks you have left over from the mid-1990s, then you might fancy QPS's **Que SuperDisk 240MB** external drive. The \$179 USB unit supports 240MB and 120MB SuperDisk media as well as stan-

dard 1.44MB disks—in fact, it lets you cram 32MB of data onto each old floppy.

True, most desktop users are probably better off with one of today's affordable CD-Recordable drives and their roomier media. But notebook owners, especially those with

thin-and-light models that lack a built-in floppy or CD-R drive, may find more to like. Plus, the sub-1-pound Que SuperDisk 240MB draws its power through the USB port, which means you have no extra power cords to carry.

I tested a shipping unit on a desktop PC; the USB installation was a breeze. You really can store 32MB on a regular floppy, thanks to the included SuperWriter 32 software, which allows the drive to write data closer together and with more compression.

However, you can access that data only by using another SuperDisk 240 drive with the SuperWriter 32 software.

QPS throws in Dantz's robust Retrospect Express back-

up software, which costs \$49 when purchased alone. Also included is the Que D2D DVD-authoring program. Remember that a standard 1.44MB floppy reformatted to 32MB capacity will hold just over 3 minutes of low-quality video or about 1 minute of DVD-quality video. This software will be more useful with the 240MB SuperDisks, which each hold about 28 minutes of DVD-quality video.

—Tom Mainelli



QPS'S QUE SUPERDISK 240MB drive reformats 1.44MB floppies to hold 32MB each and supports SuperDisk 120MB and 240MB media.

Que SuperDisk 240MB

QPS

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Offers multiple options for the storage-deprived, but makes little sense for desktop users.

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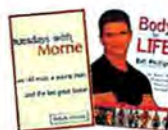
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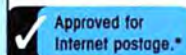
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TELEPHONY

DON'T FEEL like looking up phone numbers? If you install Mindmaker's **Tell A Phone** system, you won't have to.

The \$100 Tell A Phone turns your phone book into a voice-enabled dialer for all phones on a single line—with help from a box about the size of a desk stapler. I looked at a

Tell A Phone

Mindmaker

(Preproduction unit, not rated)

Could be useful in a small or home office, but the price and the PC power requirement make it less convenient for home use.

List: \$100

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preproduction unit. You connect the box to any phone jack and then to your PC's USB port with the included cable.

After you install the software from a CD-ROM, you either type in the names and phone numbers you want to use or let the program's wizard assist you in importing existing phone listings from a Palm PDA or from Microsoft Outlook, Lotus Organizer, GoldMine 4, or Symantec Act database files. You can also import listings from other applications, using comma-separated value files. Installation took only a few minutes.

You can identify your contacts by first name (Bob), last



TELL A PHONE'S small box connects the PC to a phone line.

name (Smith), full name (Bob Smith), nickname (Babe), or name of business (Pizza Hut).

Once setup was completed, I simply picked up any phone on that line and spoke the name clearly—Tell A Phone did the dialing. However, your computer must be on for the system to work, which makes

this product more feasible for a small or home office than for personal use. Tell A Phone requires a PC with Windows 98 or later, a USB port, and a minimum of 32MB of RAM. Linux and Mac users are out of luck. The program works on any normal analog phone.

—Frank Thorsberg ■

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PRESENTATION CHIC



PETER SERLING

Participation and interaction is the key for keeping your audience calm, says Rebecca Mazin, president of Recruit Right in Larchmont, N.Y., and a training consultant at Westchester Community College.

New technologies meet traditional techniques to make presentations more natural, more interactive, more productive, more FUN

"I was making an internal presentation for the first time to a group of my peers. Once we got going, I realized I was using an old version of my presentation. This one was riddled with the wrong information, and it queued the wrong content at the wrong time."

So recounts John Cassese, a principal with New York City-based Concentric Communications (www.ketchum.com/about/), and a veteran in the field of presentations and training seminars. There are lots of potential pitfalls when it comes to presenting before an audience, but most of them can be remedied or avoided with hassle-free equipment, a calm demeanor and a sense of humor.

Your ability to handle problems gracefully will ingratiate you with the audience, Cassese says.

Continued on page 3

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Continued from page 1

He notes that if it's a fear of public speaking that's gripped you, there's another emotion that's strong enough to counter your fright. "Think of something that makes you angry, [since] your anger is a primal instinct that will diminish your fear."

There's a lot of misguided, if well meant, advice aimed at public speakers, presenters, and trainers. What's important is to trust your instincts, says Cassese. "There is no magic in public speaking; it takes practice – and lots of it – to prevent anxiety."

MANAGE YOUR AUDIENCE

Nor is anxiety confined to the presenter. It can ripple through an audience and become a major inhibitor to audience participation. Ultimately, it could undermine the success of your presentation.

Just as you have techniques to minimize your anxiety or apprehension, you should also have techniques to calm your audience. "Participation and interaction is the key," says Rebecca Mazin, president of Recruit Right in Larchmont, N.Y. (www.recruitright.net), and a training consultant at Westchester Community College. Mazin uses a team-building technique she calls peer-to-peer fusion. By encouraging the audience to find some unity with one another they start to lower their guard and are more likely to participate in discussions.

"In one team-building exercise, I ask 15 or so people in the audience to stand and form a circle. Then I ask non-personal questions such as, 'who wears glasses' or 'who likes chocolate.' All the people who fit that profile [then] step into the center of the circle. After a short time, everyone in the group has revealed one or more similarities that help them relate to the other participants."

WE BE THE THREE

Once you move beyond the "getting to know you" icebreaker stage, and you're standing in front of the audience ready to begin your presentation, training or speech, you need to deal with the three universal components that underpin all public speaking: content, delivery and technology.

The goal of content creation is to skillfully blend words, sound and graphics into a free-flowing, eye-catching symphony of ideas.

After you've sweated over developing and pol-



ishing your content, it's planning that makes the delivery a success. Before you ever step in front of your audience, you'll have thought about body language, hand motions that discreetly enfold the audience, maintaining eye contact, voice modulation and stepping away from the safety of the lectern. Here too, is where you put into practice the best of the well-meaning suggestions for keeping your voice steady – such as taking deep breaths and drinking lukewarm (never cold or hot) water with a squirt of lemon before you take the stage.

If creation and delivery sound like they require a lot of hard work, it's because they do. But the third

Continued on page 5

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Canon KNOW HOW™

Continued from page 3

component lets you indulge in the fun part and use the newest technology and products to help make your ideas shine.

TECH IT EASY

One such product line is Mitsubishi's LCD-based line of XGA- and SVGA-resolution microportable projectors. Delivering a tremendous 1,000 ANSI lumens, the entry-level XL1 and SL1 projectors offer Mitsubishi's award-winning ColorView Natural Color Matrix, sRGB color compliance, IRIS (Intelligent Room Illumination Sensor) control, plus digital keystone adjustment, manual zoom and focus lens.

ColorView Natural Color Matrix, a groundbreaking technology based on a patented algorithm for controlling color, provides consistently rich, saturated colors. ColorView's innovative six-axis color control function produces accurately reproduced colors that are especially well suited for computer graphics and video displays.



MITSUBISHI'S XL1 microportable projector controls color with the company's award-winning ColorView Natural Color Matrix technology.

The sRGB Color Profile (a Microsoft Windows' standard) built into the XL1 and SL1, allows presenters to more accurately match the projected colors with the colors on the CRT monitor they used when creating the slides. Flesh tones and natural colors are equally realistic on both computer and video displays thanks to this technology.

Capitalizing on its television technology expertise, Mitsubishi's IRIS control sensor automatically senses room brightness. It instantly adjusts the projector's contrast and image controls to create the best image under existing lighting conditions no matter how fast conditions change. So, for example, if someone opens a door or a window shade that changes a room's ambient light level, IRIS automatically increases or decreases the projector's illumina-



SYNERGY SOLUTIONS' SlideShow Commander lets you command presentations from your PDA.

tion to maintain optimum clarity and image integrity.

These improvements in illumination and color accuracy will literally display your content in the best light. Now, you need to do your part with delivery techniques that will create a lasting impression, boost retention and maintain the audience's interest.

A NEW VIEW

Another team-building technique that Recruit Right's Mazin uses to heighten the audience's interest is to personalize the training and encourage participation. In her presentation and training classes she asks random participants to relate some personal experiences as consumers. By seeing one another as customers, as well as co-workers and employees, Mazin says, it changes their attitude and lets them see a process from the other person's point of view.

Mazin is always prepared to use one of her team-building, icebreaker or unifying strategies as soon as she sees the need. "I use them to draw the people out, to enliven them," she says. "I do not wait until their eyes glaze over and they are among the waking dead."

Here too, delivery technique and technology complement one another to help the presenter persuade and enlighten the audience. For example, owners of personal digital assistants (PDAs) that use the Palm OS, such as the Palm Pilot, IBM WorkPad and Handspring Visor, will appreciate Synergy Solutions' SlideShow Commander. Here's one of those "I gotta have it" practical products that let you concentrate on your message instead of your equipment. A free demo of the low-cost time-saver is available at www.synsolutions.com.

By putting your entire presentation at your fingertips, SlideShow Commander allows you to move around the room for a more natural interaction between you and your audience. What's more, you can

Continued on page 7



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Continued from page 5

view a thumbnail of the current slide, use the PDA's buttons to navigate forward and backward, jump to any slide instantly, and generate a black screen at any time during a pause.

In addition, SlideShow Commander increases interactivity by letting you use the Palm Pilot's Scribble feature to mark text on the PDA screen (such as circling a word or point for emphasis) that is immediately displayed on the projected image.

SlideShow Commander provides a flexible 15-foot serial cable that connects your PDA to the PC or laptop to control the presentation. The newest version replaces the cable with wireless commands if your PDA is Bluetooth equipped. A Compaq iPAQ Pocket PC-compatible version of SlideShow Commander that works over 802.11b wireless LANs is also expected to be available at the time of this writing.

LOSE THE LAPTOP

For the ultimate in untethered mobility, try checking out Sony's (www.sony.com/professional) family of ultraportable SuperLite LCD projectors. The family now includes the VPL-CX3, the first digital projector featuring Sony's Memory Stick removable media technology for PC-less presentations. This revolutionary projector lets presenters and trainers save their files directly to a Memory Stick and then import presentations or image files directly into the VPL-CX3, thereby eliminating the need for a PC. Talk about a weight savings!



SONY'S VPL-CX3 SuperLite LCD projector is the first to feature Sony's Memory Stick removable media technology for PC-less presentations.

Sony's solid-state Memory Sticks use no moving parts, which make them an ideal media for travelers. In combination with Sony's VPL-CX3 projector, Memory Sticks significantly simplify transporting your ideas in a shirt pocket, whether it's across the hall or across the globe. Currently available in capacities up to 128Mbytes, Memory Sticks will store and transfer image, MPEG video, graphics, presen-



LIGHTWARE'S Traveler projector is connected to Handspring's Visor PDA using the Presenter-to-Go Springboard expansion pack from MARGI Systems, creating a complete presentation package weighing less than six pounds.

tation and digital files quickly and easily.

The VPL-CX3, along with two other models in the SuperLite family (the VPL-CX2 and VPL-CS3), weighs in at a shoulder-saving 5.5 pounds. All three feature a retractable pop-up front cover to protect the projector lens and twin stereo speakers. The VPL-CX3 and VPL-CX2 models offer true XGA (1,024x768 pixels) resolution at 900 and 750 ANSI lumens, respectively. The VPL-CS3 unit offers SVGA (800x600 pixels) resolution at 700 ANSI lumens.

The SuperLite line of projectors employs Sony's Multiscan technology, which allows the units to accept a variety of video inputs in addition to PC signals. The units display images ranging from 40 to 150 inches of viewable area (measured diagonally).

Other key features standard in each projector include a four-times digital zoom and a remote control unit with joystick for direct control of digital zoom and freeze functions, as well as control of RGB video and PC signals.

BEARABLY LIGHT

Smaller, lighter and brighter are the hallmarks of presentation equipment today. And customers are the fortunate recipients of vendors' ongoing quest to reduce the cost and raise the quality of their products – for example, using a Handspring Visor to control Lightware's Traveler and Scout multimedia projectors.

With more and more mobile professionals emailing with various handheld devices, lugging a PC around just to drive presentations can be annoying. For this and other reasons, mobile professionals whose livelihood depends upon delivering world-class presentations welcomed the announcement of an innovative presentation solution from Beaverton,

Continued on page 11



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Every presentation, training session or public speech consists of three elements – content, delivery and technology. How you combine these elements will determine how memorable – or forgettable – your presentation is. To finish with the best results, you must start with the best products, and this means choosing vendors not only with integrated product lines, but also with experience and market savvy.



CANON'S PR-200 sheet scanner connects directly to Canon projectors, allowing PC-less scanning.

One such vendor is Canon USA (www.canondv.com). Its recently announced Presentation Products Initiative (which groups popular Canon products together) is designed to help you enhance message impact and retention as well as boost audience response. Products include its digital video camcorders (which let you capture eye-catching video footage and import it to your PowerPoint presentation), LCD projectors, high-quality digital cameras, high-resolution digital document cameras, a new sheet scanner that connects directly to Canon projectors, and

Internet/intranet tools.

Canon's lineup of presentation products and tools are designed to help fuel your creativity while maximizing productivity. The company has created three image acquisition and delivery systems, consisting of complementary product groups selected with input from professional presenters and trainers.

MIX, MATCH AND MASTER

Look over the integrated components in Canon's Economy presentation package and you'll see the only thing entry-level about this collection is the price. It includes Canon's sub-six-pound SVGA LV-5100 multimedia projector, plus the ZR25 MC digital camcorder, which can capture both still images and digital video.

Other components include a multifunction tabletop video presentation camera and the PR-200 Presentation Assistant scanner, which attaches to a Canon projector and allows documents, photos and overhead transparencies to be projected instantly. Since the PR-200 does not require a PC for scanning, it gives you the freedom to leave your laptop behind.

Need more capability and advanced features? Canon's Wide-Use presentation package features its XGA LV-7105 multimedia projector. Complementary components include a digital camcorder offering three recording modes when shooting digital video or still photos, a multifunction tabletop video presentation



CANON'S XGA Turbo Bright LV-7345 multimedia projector, part of the company's Hi-Resolution system, offers optional removable storage.

camera with zoom lens and pan/tilt/zoom, plus the PR-200.

For the highest level of image quality, check out Canon's Hi-Resolution system, designed for capturing and displaying high-precision images. It uses the company's razor-sharp XGA Turbo Bright LV-7345 multimedia projector with dual brightness levels, plus an optional Compact Flash Media Card for removable storage. Other components include the XL1S professional digital camcorder, the PR-200 and the DZ-3600U high-resolution (1,900x1,424 pixels) tabletop digital video presentation camera, which can capture hard-to-read details on charts, blueprints and physical objects.

EVERYTHING YOU NEED

With integrated product sets such as those in Canon's Presentation Products Initiative, you don't have to worry about the technology component of your presentation – and that's the way it should be. Increase your focus on content and delivery, and for your next presentation your audience will sit up and take notice.

Bells.



Whistles.



Introducing the new InFocus® LP™530 with expansion module. Think of it as the projector that grows with your needs. Right out of the box, the new LP530 gives you more projector for your money. Less than six pounds, 2000 lumens, Faroudja™ video, XGA resolution, and state-of-the-art DLP™ technology by Texas Instruments for unsurpassed image quality. And if you decide you need more inputs, simply snap in the optional expansion module for a conference room powerhouse. More modules will come along as technology becomes available. So while other projectors become obsolete, your LP530 will just keep getting better and better. For more details, including a 3-D view, visit www.infocus.com/pwd or call 1-888-InFocus.

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Continued from page 7

Ore.-based Lightware (www.lightware.com/). Working with MARGI Systems of Fremont, Calif., Lightware has married its ultraportable projectors to Handspring PDAs to eliminate the need for a laptop when making bright and clear presentations. This new combination gives users a complete presentation package weighing less than six pounds.

The solution connects Lightware's Traveler and Scout multimedia projectors to Handspring's Visor PDA using the Presenter-to-Go Springboard expansion pack from MARGI. Presenter-to-Go incorporates desktop software to create presentation materials from any printable program, such as Microsoft PowerPoint or HTML Web pages. Before leaving the office, presenters use a simple link-up between their PC and the Visor PDA to store their presentation materials. Once on the road, presenters then connect the PDA to any one of Lightware's ultraportable pro-

jectors. Included software for the PDA lets presenters rearrange slides on the go, just as they would on a laptop. The new package gives mobile executives the utmost benefit in traveling light without sacrificing presentation quality.

IT'S ABOUT CONTROL

What today's technology options give you, more than anything, is increased flexibility and control over presentation content and delivery – features that make it easier to both prevent horror stories and send your audience away with your intended message.

"Nobody wants to see things go wrong; it's like watching a car accident," says Cassese. "Your ability to deal with technical glitches smoothly will put everyone at ease," and enable you to concentrate on the fruits of your labor.

Continued on page 188

When Less Is More

Bigger is better may apply to sport utility vehicles and action movie stars but not to projectors. Just ask the presenters and public speakers who carry the projectors from place to place, along with their laptops, personal digital assistants, and cell phones. For them, less is more.

InFocus (www.infocus.com), a vendor long associated with the introduction of pioneering features in microportable projectors, is at the head of the class with its premium lightweight, the LP130.

NO COMPROMISES

Delivering a brilliant 1,100 lumens of illumination (bright enough to overcome ambient light), full multimedia functionality and true XGA resolution (1,024x768) at a sharp 400:1 contrast ratio, this three-pound package asks for no compromises in convenience or image quality. The LP130 uses Texas Instru-



INFOCUS' LP130 premium lightweight projector delivers 1,100 lumens and true XGA resolution.

ments' Digital Light Processing (DLP) technology to project a crisp distortion-free image. What's more, with its zoom lens and digital keystone correction, your audience never needs to strain to see the content you worked so hard to produce.

Measuring just 6.7 inches by 8.6 inches by 2 inches, this powerhouse is smaller than most laptop PCs, making it ideal for multimedia shows as well as traditional business presentations. The LP130 supports a wide range of image input sources including HDTV, DVD players, camcorders and gaming consoles. Other premium features include 2,000 hours of lamp life and USB connectivity.

Protected against the bumps and bruises of travel by a rugged, lightweight magnesium case, the LP130 achieves a new plateau in projector portability.

Lose weight instantly.



Trash those extra pounds. Lightware, Handspring™ and Margi Systems now have the easiest way for you to lose 10 pounds instantly. Simply load your presentation onto your Handspring and leave your laptop at the office.

Look great. No laptop, no extra bag and no extra cords means you'll feel 10 pounds lighter. Not lugging around all that extra weight means you'll have more energy for a winning presentation.

Eat whatever you want. This is not a fad diet. It's fact. You'll keep the weight off as long as you use this amazing combination for your presentations. Visit www.lightware.com/nodiet now or call 1-800-211-9001 to get rid of the unwanted pounds that you have been carrying around for years.



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For those who've experienced that certain sinking feeling during a presentation, we offer the Epson PowerLite® projector series. Not only are they easy to set up but, weighing as low as 5.8 pounds, they're just as easy to carry. Your audience is sure to love the image quality and clarity that comes from our industry-leading 3-LCD projectors.

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PC Deals

You Better Shop Around

BY DANIEL TYNAN ILLUSTRATIONS BY LOU BEACH

Prices are fantastic, but where should you buy your next PC? We went undercover to help you find the best merchants—and avoid the worst salespeople.

I'M STANDING in a Circuit City in coastal North Carolina; Richard—
young, tan, and friendly in a false-
ly ingratiating way—is helping me
buy a computer. Behind him,
Christina Aguilera shimmies on a
bank of video screens. Richard
shows me a fully loaded 1-GHz
Compaq Presario going for
around \$1000, not including a
monitor. A truly terrific deal, but
he doesn't appear to know that.

"These here are your drivers," he
says, indicating the floppy, CD-
Rewritable, and DVD-ROM drives,
"and it comes with a 16-bit graph-
ics card, which goes well with your
NEC Mitsubishi monitor."

It's bad enough that Richard
confuses the graphics card with the
sound card and says "Mitsubishi"
when he means "MultiSync," but
then he commits the cardinal sin
of lame computer salespeople: He

presses the DVD drive's button, slides out the tray, and tells the coffee cup holder joke. His advice is as bad as his jokes, and when I walk out of the store with the Compaq, he seems almost as amazed at the sale as I am. But I have a good excuse for buying a new computer from Richard the annoying: I was on a mission from *PC World*.

TALKING SHOP

PC PRICES have fallen to new lows, but figuring out where to buy your next PC is still a challenge. So on one long weekend last May, we set out to find the best and worst places to purchase a computer. Five undercover shoppers in California, Illinois, Massachusetts, North Carolina, and Texas each visited ►



Some of the phone reps we talked to really knew their stuff. With others, we wondered how they survived high school.



eight retail stores: Best Buy, Circuit City, CompUSA, Costco, Gateway Country, Office Depot, Staples, and an independent retailer, also known as a mom-and-pop. We browsed the Web sites of six online merchants (Buy.com, Dell, Gateway, Hewlett-Packard, PC Connection, and Polywell), then called each one's sales line to check out their phone sales force. We bought one computer from a representative mom-and-pop store and one from each other vendor (14 in all), plugged them in to make sure they worked, then returned them and waited for the refunds.

Our target PC was a 1-GHz system with 128MB of RAM, a 30GB hard drive, DVD-ROM and CD-RW drives, a V.90 modem, a 32MB NVidia graphics card, an office suite, and a 17-inch monitor. And our firm price limit was \$1500, not including shipping. Last year it would have been impossible to get that configuration for that price; these days it's a cakewalk.

Along the way we rated the seller's computer selection and the sales staff's knowledge, courtesy, and efficiency. We tossed in red herrings—asking questions such as “Can I get this system with 200MB of memory?”—to see if they'd swallow the bait. We also rated the vendor's service when we returned the PCs, tracking how long it took each company to refund our money, and noting the lengths to which the vendor would go to keep the sale. Finally, we picked the best and worst channel—retail, phone, or Web—for price, selection, service, and more.

The best choice in nearly every category was the Web. And small wonder: Web shopping allows you to compare a broad selection of brands and systems, mix and match components, and get scads of information at any hour of the day or night. The benefits are so compelling that retail outlets have tried to duplicate them. Nearly every computer retailer we visited

had a Web-based kiosk at which you could configure systems and have them shipped directly to you. (The Circuit City outlet we visited in North Carolina also had one, but the sales rep, Richard, could not figure out how to use it.)

Even the phone sales reps we talked to seemed to be clicking through the lists of specifications available on their company Web sites. Meanwhile, Gateway and HP have addressed one of the key drawbacks of Web shopping—the lack of human contact—by adding live chat capability to their online stores.

As in the past, Dell's site is best overall. It's easy to navigate, and the company offers highly configurable PCs and useful buying advice. But getting our refund from Dell took the longest—30 days.

With online stores like Dell's at your fingertips, why leave the house?

SITES AND SOUNDS

BEST: Web

WORST: Retail

SHOPPING FOR a PC is a sensory experience that can be good, bad, or (on occasion) surreal. One of our undercover PC shoppers, Sofia Martinez of Austin, Texas, observes that CompUSA is “bright, clean, and stinks of plastics.” The same could be said for the megastores, from cavernous Costco warehouses to raucous consumer electronics shops such as Best Buy. The bigger stores often cram systems together on shelves, and provide little information about them beyond the stickers on the sides of the machines. Visiting a store can even prove dangerous. Reporter Tom Spring's visit to a Costco in Massachusetts resembled Hitchcock's *The Birds*, as he dodged chickadees dive-bombing from the rafters.

Some retailers did offer a more comforting experience. The mom-and-pop Chicago Cyber Exchange, for instance, has “a coffeehouse feel with high ceilings and upbeat music,” says undercover PC shopper Katharine Dvorak. And every Gateway Country store is like a mini-Ikea showroom, with workstations displayed to reflect different digital lifestyles.

By contrast, dealing with phone and

Web-based vendors is much more sedate. Aside from differences in hold music and voice-mail menus, the phone-based merchants were nearly identical. But Web sites varied as widely as the retail outlets, from the uncluttered, well-organized sites of Dell, Gateway, and HP to the densely packed home page of Buy.com. Dell's site offers several handy features, including three ways to look at your system configuration (a page with drop-down menus for each component, a page that lists all your options at once, and a concise, print-

able summary page), as well as the ability to buy some of the items in your shopping cart but save others for later.

Unfortunately, Web shopping can be frustrating, too. Polywell's site, for example, contains more specs and acronyms than an engineering manual, making it a geek's paradise and a novice's nightmare. We found a bug in PC Connection's System Selector: Specify any hard disk size and only 10 percent of the vendor's desktops show up. (We notified the site of the error, but when we checked back more

than a month later, it had yet to be fixed.) We also encountered temporary shopping cart glitches at both Gateway's and HP's sites. But minor annoyances aside, we still prefer the quiet, relatively pressure-free atmosphere of the Web.

FREEDOM OF CHOICE

BEST: Web

WORST: Retail

RETAIL OUTLETS have historically offered the broadest selection of computer brands, but that's starting to change. The vast majority of desktops on store ▶

COMPARISON

BEST AND WORST PLACES TO BUY A PC

| | COMPANY | PC brands | Standard warranty: parts/labor/on-site (years) | One-way shipping cost ¹ | Time from purchase to delivery ¹ | Return policy ² | Restocking fee | Wait for refund ^{3,4} | Our verdict |
|-------------|---|--|--|------------------------------------|---|----------------------------|------------------|--------------------------------|---|
| Retail | Best Buy 888/237-8289 www.bestbuy.com | Compaq, EMachines, HP, MicronPC, Sony | Varies by manufacturer | n/a | Same day | 14 days | 15% | Same day | Informative salespeople helped us find a PC within our budget. But some clerks gave a hard sell on the extended warranty. ★★☆☆☆ |
| | Circuit City 877/932-2225 www.circuitcity.com | Compaq, EMachines, HP, Sony | Varies by manufacturer | n/a | Same day | 14 days | 15% | Same day | The McDonald's of consumer electronics had a reasonable selection of PCs, but sales help ranged from mediocre to pathetic. ★★☆☆☆ |
| | CompUSA 800/251-2665 www.compusera.com | Compaq, CompUSA, EMachines, HP, Sony | Varies by manufacturer | n/a | Same day | 14 days | 15% | Same day | Big selection, good deals, and fairly knowledgeable sales reps—provided you can get their attention. ★★☆☆☆ |
| | Costco 800/774-2678 www.costco.com | Compaq, HP, MicronPC | Varies by manufacturer | n/a | Same day | Unlimited | None | Same day | Few PCs to choose from but great deals, and its 100 percent money-back guarantee can't be beat. \$45 membership fee. ★★☆☆☆ |
| | Best Buy Gateway Country 800/846-4208 www.gateway.com | Gateway | 3/3/1 ⁴ | \$127 | 7 days | 30 days | None | 17 days | Tech-savvy sales team gladly showed us their PCs and peripherals. Expect to wait seven or more days for a system to arrive. ★★☆☆☆ |
| | Office Depot 888/463-3768 www.officedepot.com | Compaq, EMachines, HP | Varies by manufacturer | n/a | Same day | 14 days | None | Same day | Returning a PC was a breeze, but sales help ranged from good to awful, and the store carried a limited selection of PCs. ★★☆☆☆ |
| | PCs for Everyone⁵ 617/395-7200 www.pcsforeveryone.com | PCs for Everyone | 1/1/n/a | n/a | 3 days | 14 days | 4% | Same day | Expert help made us think of guys hanging around an auto parts store talking about souping up their Chevy. ★★☆☆☆ |
| Phone & Web | Staples 800/378-2753 www.staples.com | Compaq, HP, Toshiba | Varies by manufacturer | n/a | Same day | 14 days | 15% ⁴ | 5 days | Great place to buy a gross of paper clips. But PC selection and sales help were ho-hum. ★★☆☆☆ |
| | Buy.com 949/389-2000 www.buy.com | Acer, Compaq, EMachines, HP, IBM, NEC, Sony | Varies by manufacturer | \$44 | 6 days | 30 days | None | 3 days | Easy purchase and return procedures but a horrible selection of home PCs—most of which were out of stock. ★★☆☆☆ |
| | Best Buy Dell 800/915-3355 www.dell.com | Dell | 1/1/1 | \$95 | 12 days | 30 days | None | 30 days | Lots of component options; Web site and sales reps offer a wealth of information. But getting a refund took weeks. ★★★★★ |
| | Gateway 800/846-4208 www.gateway.com | Gateway | 3/3/1 ⁴ | \$132 | 9 days | 30 days | None | 15 days | Plenty of choices for components, plus generous three-year standard warranty. But we paid a premium for shipping. ★★☆☆☆ |
| | Hewlett-Packard 888/999-4747 www.hpshopping.com | HP | 1/1/1 | \$35 | 10 days | 30 days | None | 1 day | Helpful service and hassle-free returns (HP even paid for shipping a PC back), but shopping advice can be hard to find on the site. ★★★★★ |
| | PC Connection 800/800-0011 www.pcconnection.com | Acer, Compaq, Epix PC, HP, IBM, NEC, Sony, Toshiba | Varies by manufacturer | \$51 | 7 days | 30 days | 15% | 12 days | PCs posted in its disorganized, buggy Web site were geared for business users. We received spotty service, too. ★★☆☆☆ |
| | Polywell 800/999-1278 www.polywell.com | Polywell | 3/5/1 | \$120 | 14 days | 30 days | 15% | 24 days | Infinitely customizable systems marred by infinitely geeky site and sales help. Worse, we couldn't order online. ★★☆☆☆ |

n/a = Not applicable. ¹ Based on our experience. ² From date item was received. ³ On credit card payment. Refunds on cash or check payments may take several days. ⁴ Home PCs only. ⁵ Independent PC retailer in Cambridge, Massachusetts, from which we purchased a PC for this article. ⁶ On built-to-order systems.



Reporter Tom Spring's visit to Costco resembled Hitchcock's *The Birds*, as he dodged chickadees dive-bombing from the rafters.

shelves bear the logos of Compaq and HP. Bigger chains, including CompUSA and Circuit City, carry some Sony and Apple computers, plus a smattering of older EMachines and MicronPC systems. Otherwise, nada.

The big Web- and phone-based merchants aren't much better. PC Connection and Buy.com offer a broader selection (including Acer, IBM, and NEC) than their brick-and-mortar rivals, but many of the systems have bare-bones features. At Buy.com, more than half the systems that met our criteria were out of stock. On the plus side, PC Connection provides a nifty chart that lets you compare specs side by side for up to five systems at a time.

Still, the Web takes this category hands down. It's the only channel that lets you easily compare a Dell PC, say, to a Gateway, a Compaq, or virtually any other PC. Even if you have to visit a dozen sites, it's a lot easier than schlepping from store to store, or calling half-a-dozen merchants.

HAVE IT YOUR WAY

BEST: Web

WORST: Retail

IF YOU'RE PICKY about the parts that go into your PC, you probably won't walk out of a retail store with the machine of your dreams. Most stores sell off-the-shelf systems as is—unless you buy a piece of hardware separately and have the store's service center install it the same day. But the retailers are starting to catch up to the flexibility of Web and phone vendors. Most chains feature "build-to-order" kiosks where you can custom-configure a Compaq and/or HP system and have it shipped to your home (shipping charges and taxes will likely apply). In most stores, it was the only way to get a PC with the graphics board we wanted.

But such kiosks offer no advantage over doing it yourself on the Web. At an Office Depot in Wilmington, North Carolina, a

sales rep named Elton quickly realized that the system we wanted was not in his store, marched over to the Compaq kiosk, and configured a Presario 7000Z that matched our specs exactly. The price was \$1394, plus shipping charge and sales tax (\$65 and \$87, respectively). Elton claimed customers get a better price through Office Depot's system than they can on the Web. But when we checked Compaq's site, we configured an identical Presario for the same base price.

Mom-and-pops and many phone-based vendors also build PCs to your specifications, but in both cases you're relying on the sales rep to present all your options.

In the realm of customization, the Web is king: You can see your options and browse the online aisles for as long as you like. But not all sites are equally flexible. At Polywell.com you can specify everything but the type of screws they use to put the PC together. But you can't order it online; the company takes orders only via phone. At Gateway.com, on the other hand, you can specify options like memory or hard drive size, but you have to pick a preselected combination package for the graphics board, sound card, and network interface card. Buy.com and PC Connection offer you no way to customize systems online. (PC Connection can custom-configure a system if you order by phone.)

HELP IS HARD TO FIND

BEST: Web

WORST: Retail

TALK TO ENOUGH computer salespeople and you start to question whether Darwin was right. Some folks we talked to, like the sales reps on Dell's and HP's phone lines, really knew their stuff. We wonder how others survived high school.

For example, when shopper Tom Spring asked a sales rep at the CompUSA in Cambridge, Massachusetts, if he could control a PC with his cell phone, the rep

swallowed the hook. Sure, he said, you could use it "kinda like a wireless mouse." Tom asked salespeople at other Boston-area stores whether that was true. It turns out that sales staffers at Staples and the local store PCs for Everyone also subscribe to the cell-phone-as-mouse theory.

But staffers in retail stores had no ►

TIPS

GUIDE TO SAVVY SHOPPING

- 1. Know what you want:**
Don't expect the salesperson to know more than you. Know what you want to do with your PC and how much you can spend.
- 2. Find the right staff:**
The quality of a merchant's sales staff can vary from store to store and from person to person. If you don't find your salesperson helpful, find another one.
- 3. Hunt for special deals:**
The vendor may be offering freebies or discounts the salesperson doesn't mention.
- 4. Buy the monitor separately:**
You may get a better deal if you buy a different brand's screen. Even if you order the PC online, buying the monitor locally will save shipping charges.
- 5. Get the scoop on taxes:**
Some online or phone vendors may not collect sales tax in your state (though, legally, you are required to inform your state tax board about it).
- 6. Examine extended warranties:**
Most are profit centers for stores, and prices vary wildly. The best warranties are usually those that system manufacturers provide.
- 7. Browse while you gab:**
When shopping via phone, go to the company's Web site—it may have more options than the sales rep mentions.
- 8. Get the return policy in writing:**
Ask if the money-back period starts at the time of purchase or when the PC arrives. Ask about restocking fees. If you're buying through the mail, find out if you're liable for shipping costs one way or both ways.
- 9. Comparison shop:**
Most stores will match prices from other retailers (not necessarily Web sites). Know what other stores charge for the same PCs.
- 10. Play hardball:**
Ask the salesperson if there's anything she or he is willing to toss in to close the deal.

—Tom Spring and Daniel Tynan



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monopoly on ignorance and questionable advice. When Tom called PC Connection, he was put on hold *nine* times while sales rep Jennifer hunted down answers to his questions. "You can only think about so many things at the same time before your brain can't process things anymore," she said.

A call to Gateway's 800 number was answered, in Spanish, by a salesperson named Sirena. (During peak times, calls roll over to Gateway's bilingual sales line.) She explained that her name meant "little mermaid"—but was quickly in over her head. She had no idea what DSL was, and when we asked about the difference between Intel and AMD, she put us on hold to find out (her answer: Intel spends more on advertising).

At the opposite extreme was Polywell's Ivy, The Woman Who Knew Too Much. Hopelessly geeky, she tried to outfit us with a hard disk mirroring system for our home office, blithely tossed around ac-

Watch out for sly salespeople: One Circuit City rep added \$270 to the bill for a four-year extended warranty—hoping we wouldn't notice.



ronyms like RAID and DDR, and never asked what we wanted to do with the computer or how much we wanted to spend.

How to escape less-than-helpful salespeople? Your best bet is to politely get off the phone (or out of the store) and try your luck with another rep. But you'll get more—and more accurate—sales information on the better Web sites. On Gateway's system configuration page, you can click a button to make windows appear that contain information about each component. Dell goes one better with its Desktop Buying Guide, full of easy-to-understand advice and a godsend for anyone lost in a sea of acronyms. Gateway's and HP's Web sites offer live chat with salespeople. Gateway even e-mails you

the transcript shortly after you log off. Our results were mixed: One shopper found the live chat helpful, the other did not. Still, the future looks promising for this kind of sales assistance.

Your best solution may be the Web/phone combo plate: Do your shopping online to get the exact configuration you want, and then call to make the final purchase. That way you get a chance to haggle and ask questions, as well as a rep's name and extension in case something goes wrong with your order.

TRY BEFORE YOU BUY

BEST: Retail **WORST: Web and Phone**

ONLY RETAIL STORES let you kick a PC's tires—or check out its monitor, keyboard, and speakers—before you drive it away. The best place to test-drive a system is Gateway Country, which offers sleek workstations complete with printers, groovy-looking (if uncomfortable) stools, and even live Internet connections. In a pinch, you could probably use the store as a second office—at least until the salespeople became suspicious. Still, it's just a showroom: There's no way to walk home with your favorite PC, and it took about ten days for us to get the system we ordered from Gateway's retail store.

Meanwhile, at Costco, the computers can double as babysitters. At the store in Durham, North Carolina, we found a freckle-faced, 12-year-old boy—who had escaped from his parents—merrily playing backgammon on a MicronPC. Other stores are less inviting, however. CompUSA, Office Depot, and Staples do offer free access to their PCs. But at CompUSA, the computers and monitors sit on different shelves, making it hard to figure out which display to look at. At Best Buy, you can run only the demo program they've installed on every system. Circuit City password-protects its PCs. If you ▶

PC PRICE PLUNGE

WHAT A DIFFERENCE A YEAR MAKES

COMPUTER PRICES are lower than ever. Nowadays, you can get a system with a faster CPU, double the hard drive capacity, and free Internet access to boot—all for about \$500 less than what you would have paid last year.

| | This year ¹ | Last year ² |
|-----------------------|--|---|
| System | HP Pavilion (custom) | HP Pavilion 9600A-700 |
| CPU | AMD Athlon-1000 | AMD Athlon-700 |
| Memory | 128MB of DDR SDRAM | 128MB of SDRAM |
| Hard drive | 40GB | 20.4GB |
| DVD-ROM drive | 12X | 10X |
| CD-RW drive | 8X/4X/32X | 8X/4X/32X |
| Graphics board | NVIDIA GeForce2 MX with 32MB of SDRAM | Asus AGP-V6800 with 32MB of DDR SGRAM ³ |
| Operating system | Windows Me | Windows 98 SE |
| Monitor | 17-inch HP V70 | 17-inch HP M70 |
| Warranty | One year of parts and labor, no on-site service | One year of parts and labor, no on-site service |
| Freebies | One year of America Online | None |
| Price | \$1235.16 | \$1699 |
| Tax ⁴ | \$101.90 | \$140.17 |
| Shipping ⁵ | \$34.95 | \$65 |
| Total | \$1372.01 | \$1904.17 |
| Key differences | Fast CPU, big hard drive, fast DVD-ROM drive, free Web access for a year, cheaper shipping | Slower CPU, smaller hard drive, slower DVD-ROM drive, no Web access, pricier shipping |

¹ Specs and prices as of June 5, 2001. ² Specs and prices as of July 14, 2000. ³ Uses NVIDIA GeForce2 GTS. ⁴ Based on California sales tax of 8.25 percent. ⁵ Flat rate, based on price of product, not location.

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COMPUSA



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Some stores may be very resistant to PC returns. A sales rep at a mom-and-pop we visited in Chicago put it this way:
 "If you drop the PC and it breaks...
 you own an awkward paperweight."

want to test-drive one, you must first talk to a rep. At the bottom of this heap: mom-and-pop shops, most of which had little if anything to look at, let alone try out.

A BUYER'S MARKET

BEST: A three-way tie **WORST:** None

THE GOOD NEWS: These days you can get an amazingly good deal on a PC. The bad news: It's hard to figure out which deal is really the best.

System specs vary from one model to the next, making apples-to-apples comparisons difficult. The cheapest PC we ended up purchasing was EMachines' EMonster 1000B, which we snagged from Buy.com for a hair under \$1100, including the monitor. But it lacked the DVD-ROM drive, the storage space, and the graphics card we wanted, and it's not a brand we'd recommend.

Otherwise, the systems and prices were remarkably uniform, ranging from about

\$1400 to \$1600 no matter where we bought them. The differences often came down to shipping charges and sales tax. Most of the online and phone vendors that we visited collect tax in only a few states. Shipping costs may vary depending on where you live and the items that come with the system; freight charges ranged from HP's thrifty \$35 to the \$125 charged by Gateway.

If you're looking at buying a widely available system such as HP's Pavilion 7855—which is available via phone, Web, and brick-and-mortar stores—you might save a few bucks on shipping by buying it from a nearby store. Just be careful where you do so: We found that the same Pavilion cost \$1099 (without monitor) in every store we visited but at a Circuit City in the Chicago suburb of Downer's Grove, Illinois, where it went for \$1299.

All the salespeople we asked say the stores will match prices for equivalent

systems, so it pays to shop around. And remember to play hardball. When *PC World* Associate Editor Grace Aquino declined the extended warranty at CompUSA in San Francisco, her sales rep, Alain, sweetened the deal so much that she ended up receiving unadvertised discounts on the PC, the monitor, and the extended warranty.

We found large price differences between monitors. Models sold by HP and Compaq were often \$100 to \$200 more expensive than equivalent displays sold by NEC, Samsung, and ViewSonic.

Even if you buy the computer online, though, getting the monitor locally will save you money because you won't have to pay to ship that big, heavy item.

The moral? Before you hand over the plastic, stop and do the math.

THE WARRANTY FACTOR

BEST: Web and Phone **WORST:** Retail

EVEN THE BEST PC manufacturers sometimes build a lemon; your surest protection is a solid warranty and good support policies. These days, most PCs come with one year of coverage for parts and labor and 24-hour, seven-day phone support. Gateway has the best standard warranty—three years of parts and labor and one year of on-site service. Polywell also offers a generous warranty: Most parts are covered for a year, except for the hard drive and the monitor, which are guaranteed for three years; labor is covered for a whopping five years, and Polywell includes a year of on-site service.

If your PC vendor can't match that, then you might consider ponying up for an extended warranty. Again, Gateway offers one of the best deals: \$99 for three years of on-site service and around-the-clock phone support. Many stores will fix your PC only if you bring it in (so-called depot service); some, like Best Buy, offer a choice: three years of on-site service for \$200 or three years of depot service for \$150. And depot service may have a gotcha: If the store doesn't have a service center on the premises (many don't), you could be without your PC for weeks ►

THE JARGON ♦ **Athlon:** AMD's high-end processor. ♦ **Celeron:** Intel's value processor. ♦ **Double Data Rate SDRAM:** Doubles the speed of SDRAM; competes with RDRAM. ♦ **Duron:** AMD's value processor. ♦ **Gigahertz:** One GHz equals 1 billion cycles per second. Microprocessors that run at 1 GHz or more, as most of the latest do, are ready to process data 1 billion or more times per second. ♦ **Pentium 4:** Intel's high-end processor. ♦ **Rambus DRAM (RDRAM):** Memory used in P4s; it can be speedier, but also more expensive, than SDRAM. ♦ **Synchronous DRAM (SDRAM):** The most common type of memory; plenty fast for most tasks. It comes in 100- and 133-MHz varieties.

TIPS ♦ **Power users, gamers, and digital video buffs:** Aim for the fastest CPU you can afford, with at least 128MB, preferably 256MB, of memory. ♦ **If you do mostly word processing, e-mail, Web browsing, general spreadsheets, or presentations,** nearly all processors currently on the market will suffice. ♦ **If you buy a PC equipped with an Athlon CPU,** look for one with 266-MHz DDR SDRAM memory, the fastest version. ♦ **With P4 systems,** get speedy PC800 RDRAM, not PC600. For this month's *Top 10 Power PCs*, *Top 10 Value PCs*, and *Top 15 Home PCs*, flip to our *Top 100* section, beginning on page 166.

—Anush Yegyezarian

THE JARGON ♦ **24X/10X/40X:** 24X is the speed writing to a CD-R, 10X is the speed writing to CD-Rewritable (CD-RW), and 40X is the speed reading CD-ROMs. ♦ **Buffer underrun compensation:** Prevents interruptions in data that can ruin disks; known by brand names Burn-Proof, JustLink, Seamless, SafeBurn. ♦ **Double-Density:** Standard used by Sony for writing up to 1.3GB of data per disc.

TIPS ♦ **Pay the most attention to write speed.** The state of the art is 24X to CD-R disks, but 16X is sufficient for most users. Most drives write

to CD-RW disks at 8X or faster. ♦ **If you want the latest and fastest drive,** consider buying it separately from your computer. PC makers are often behind the curve. ♦ **Get a drive with buffer underrun compensation technology** to avoid "burning coasters." ♦ **If you buy a drive that writes at 16X or higher,** keep in mind that you'll need to buy CD-R discs that are rated for those speeds.

Read more in this month's roundup of CD-RW drives on page 110.

—Melissa J. Perenson

THE JARGON ♦ **Digital Video Interface (DVI):** An alternative to the standard 15-pin analog graphics-out port that most cards include; usually used with LCDs. ♦ **Dolby 5.1:** The latest sound cards can handle this Surround Sound standard that supports five speakers and a subwoofer. ♦ **Integrated graphics and sound:** Many PCs ship with these tasks built into the motherboard, which is fine for most office applications. ♦ **Video-in, Video-out (VIVO):** Lets you capture analog video on your PC (Video-in) and run your PC's output to a TV (Video-out).

TIPS ♦ **If you need 3D performance for graphics or games,** and Surround Sound for games or music, integrated graphics and sound won't do. You'll need separate graphics and sound cards. ♦ **Most graphics cards**

come with 32MB of DDR SDRAM. Serious gamers will want 64MB.

♦ **Speakers are still the most important part of your sound system** and worth spending money on if great sound is vital to you. The best advice: Listen before you buy. ♦ **If you're using a monitor with a digital input port (usually LCDs),** get a card with a DVI-out port. ♦ **If you use two monitors,** get a graphics board that has dual-monitor support. ♦ **If you want to capture video,** or send a DVD movie from a PC to a television, choose a graphics board with Video-in and Video-out support. ♦ **If you want to watch TV on your PC,** get a card with a TV tuner.

For this month's *Top 10 Graphics Boards*, go to page 185.

—Eric Dahl

THE JARGON ♦ **Aperture grille:** A CRT monitor that uses thin vertical wires to focus the electron beam; best for graphics. ♦ **CRT:** Cathode Ray Tube, the technology in the cheapest and most common type of monitor. ♦ **LCD:** Liquid crystal displays, also known as flat panels; smaller than CRTs and more energy-efficient, but also more expensive. ♦ **Shadow mask:** A CRT monitor that uses a mask with holes to focus the electron beam; best for text. ♦ **Resolution:** The number of pixels horizontally and vertically on the screen. Resolution of 800 by 600 means 800 pixels on 600 lines. ♦ **Viewing angle:** The maxi-

mum angle at which you can see images on an LCD screen.

TIPS ♦ **A 17-inch CRT is the best buy for Web surfing and simple word processing.** If you edit images or video, opt for a 19- or 21-inch CRT for extra workspace. ♦ **LCDs save space on cramped desktops** and use 72 percent less energy. ♦ **If you stare at your screen for hours,** consider a flat CRT—you'll get brighter colors with less glare. ♦ **Look for a model with a refresh rate of at least 70 Hz.** At a lower rate, the image flickers.

For this month's *Top 10 Monitors*, go to page 183.

—Kalpana Narayanamurthi

THE JARGON ♦ **10Base-T, 100Base-T, and 1000Base-T:** Maximum data throughput of 10 mbps, 100 mbps, and 1000 mbps, respectively. ♦ **Auto Switching:** The ability to recognize and work with networks of more than one speed. ♦ **Fast Ethernet:** Another term for 100Base-T. ♦ **Full duplex:** The ability to transmit and receive data at the same time. ♦ **Gigabit Ethernet:** Another name for 1000Base-T. ♦ **RJ-45:** The port on the card to which you connect a standard network cable. ♦ **Wake-on-LAN:** This feature allows an administrator to boot the system remotely over a network.

TIPS ♦ **Auto-switching 10/100 mbps cards are the best buy for most users.** Stick to PCI network expansion cards. ISA cards are slow and limited. ♦ **Wake-on-LAN is useful for large offices** or if you want to start your home PC from the office; otherwise, you don't need it. ♦ **If you're installing a card to connect to someone else's equipment,** say a university or a broadband provider, check with them first to see what brands they recommend (and support). ♦ **If you're using Linux,** make sure to get a card that operating system supports.

—Alan Stafford



Some vendors will bend over backward to keep you from returning your PC: A sales rep from Gateway offered to knock off \$440.

while it's shipped to and from a regional service center.

Because retailers can reap big profits from extended warranties, some sales reps push them aggressively. Prices for plans are usually based on the cost of the PC, and the warranties often come in a confusing matrix of options, so it pays to take your time before deciding.

And be wary of slick sales maneuvers. At Circuit City in Wilmington, North Carolina, for example, sales dude Richard automatically added \$270 to the bill for a four-year extended warranty (apparently hoping we wouldn't notice), then whined when we asked him to remove it.

But that's better than shopper Sofia Martinez's experience with Jason, a persistent salesman at a Best Buy in Austin. First he led her into the service center, where technicians were conducting an autopsy on a dead PC. "Anything you see there is not covered by the manufacturer's warranty," he intoned (which, incidentally, was not true). When Sofia refused—for the umpteenth time—he marked "NO service plan" on her sales form.

A few minutes later Jason pulled her out of the checkout line and offered \$40 of free labor for a graphics card upgrade if she purchased an extended warranty. Once again she said no. The clerk at the checkout counter said, "You don't want the service plan?" And when she went to the service center to have the techs plug in the PC to make sure it worked, she got another sales pitch: "You know, manufacturers only give out one-year warranties for a reason...."

To borrow a line from a famous Texan: Read our lips.

Ultimately, whether to purchase an extended warranty depends on how good the manufacturer's standard warranty is, how long you plan to keep the PC, and how comfortable you are troubleshooting

problems over the telephone. If you feel more secure bringing the computer to a service center, then a retail store's warranty is probably your best bet.

REFUND RUNAROUND

BEST: None

WORST: Web and Phone

IF YOU BUY a system and change your mind later, it'll usually cost you, either in restocking fees (from 4 to 15 percent) or in shipping charges. Or, in Polywell's case, both—returning the PC cost us \$467 (ouch!). At retail shops, we typically got our money back the same day, but with Web and phone vendors we had to wait weeks to get a refund. Dell was the worst, making us wait 30 days for our money. But some vendors will bend over backwards to get you to keep your PC, which can translate into a sweet deal.

A few retail outlets (such as CompUSA) didn't charge restocking fees even though their policies said they did; others tried to charge us when their policies said they didn't. For example, Best Buy charges restocking fees only for notebooks, not desktops. That was apparently news to the salespeople in Austin, who started to knock 15 percent off our refund until our shopper pointed to the sign posted above their heads with the policy clearly stated.

Some vendors quietly accepted our returns; others treated us like pariahs when we returned to the store. But nobody tried harder to keep our business than Gateway Country. When we called Gateway's customer service line, the clerk who answered made a half-hearted effort to get us to change our minds, then put us on hold. Five minutes later another clerk, Joseph, came on the line and asked what he could do to "help facilitate you keeping this system" and "address whatever needs you have in your life right now." Did we want to delay payments for a few months? Get a free printer or scanner? Knock \$100

off the price? We said thanks, but no thanks. Okay, Joseph said, how about \$300 off? Very tempting, we said, but no. Joseph put us back on hold. Four minutes later he returned with a final offer: \$440 off the price—a 33 percent discount—if we kept it. Alas, we could not.

Equally astounding was Costco's return policy, which states you can return any item with a receipt at any time for a full refund. Refusing to believe this, we asked Costco clerks in three cities if this meant that we could buy a PC, use it for a year, then return it and get our money back. That's right, they all said, provided we returned it with all parts. (Yes, Virginia, apparently there is a Santa Claus.)

Some stores may be very resistant to returns. A mom-and-pop we visited in Chicago had no return policy at all. Joe at Chicago Cyber Exchange explained it this way: "If you walk out the door and drop the computer over some railroad tracks on your way home and something breaks ...you own a very awkward paperweight."

TOPS IN SHOPS

BEST: Web

WORST: Retail

AT THIS POINT it's no surprise that we think the Web is the way to shop. It's convenient, it's open all night, and it's free of annoying salespeople like Richard and Jason. If you want to gauge how sharp a monitor looks or how mushy a keyboard is, thorough research will also involve a trip to a retail store. And if you're uncomfortable sending your personal information over the Net or you just want to resolve any lingering questions with a real person before you put down your money, use the Web to research your options, and then pick up the phone. That way you have the best of all possible worlds. ■

Contributing Editor Daniel Tynan is an avid PC shopper in Wilmington, North Carolina. Tom Spring is a senior reporter for PC World. Grace Aquino, Eric Dahl, Kalpana Narayana-murthi, Melissa J. Perenson, Alan Stafford, and Anush Yegyezarian are PC World editors. Katharine Dvorak and Sofia Martinez also contributed research for this article.



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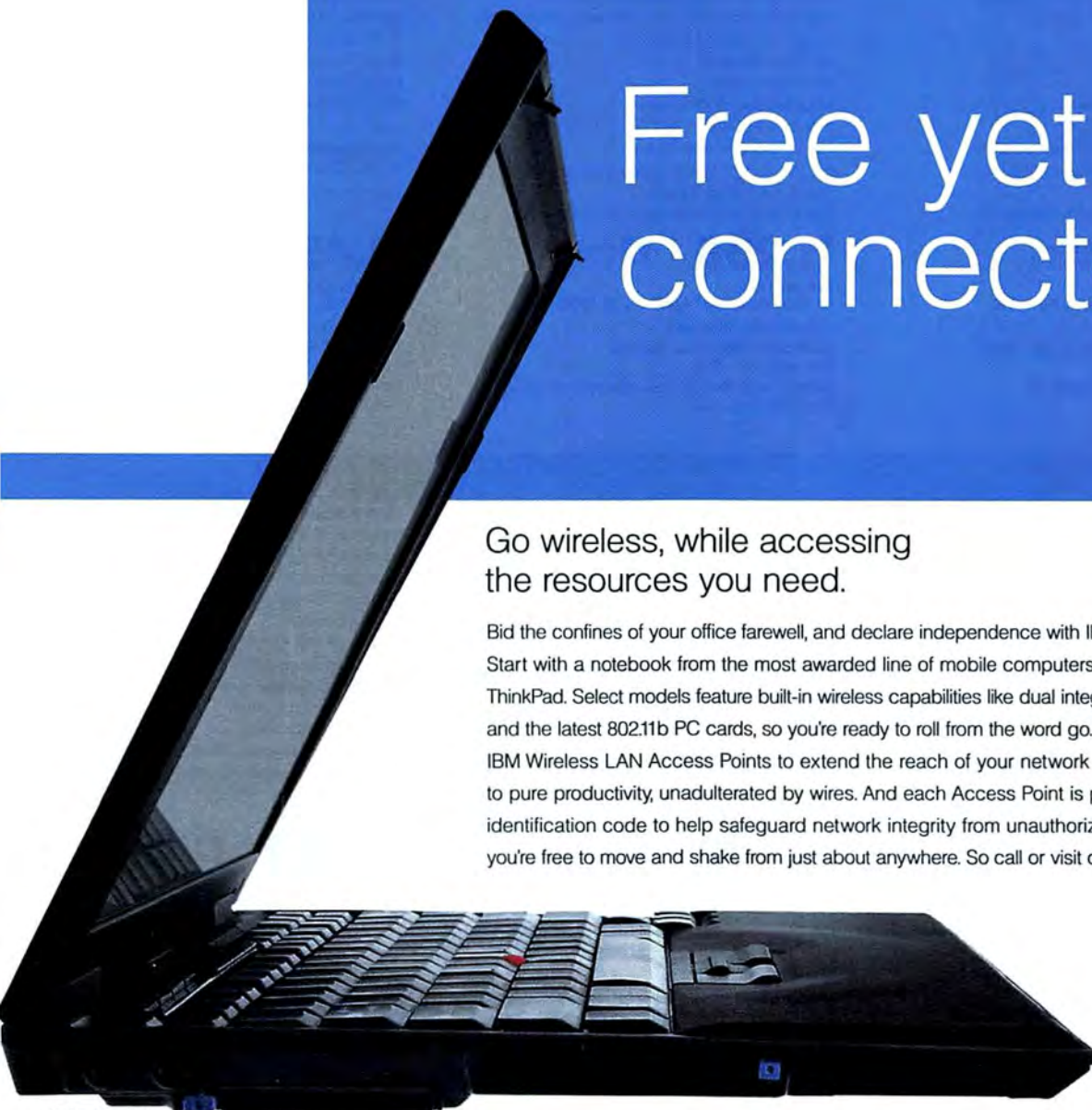
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video. Accessible system memory may be up to 16MB less than the amount stated, depending on video mode. *Certain Microsoft® software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM cannot be responsible for photographic or typographic errors. IBM makes no representations or warranties regarding third-party products or services. SuccessLease and all IBM product names are registered trademarks or trademarks of International Business Machines Corporation. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM company. Intel, the Intel Inside logo and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2001 IBM Corp. All rights reserved.

CD-RW ASAP

WAIT NO MORE: Today's CD-Rewritable drives are faster than ever before, and are excellent tools for saving data and music to CD media. The most recent generation

of CD-RW drives—rated at 24X for writing to a CD-Recordable disc—improve markedly on their 8X-rated predecessors, taking less than half as much time to fill a CD-R disc with data.

As speeds increase and as drive technology progresses, users are recognizing the versatility of this Swiss Army Knife of storage. Market research firm IDC predicts shipments of more than 53 million CD-RW drives worldwide this year. And IDC expects that number to grow by

The new CD burners deliver speed to spare. Our tests of 30 drives reveal the best deals in a crowded field.

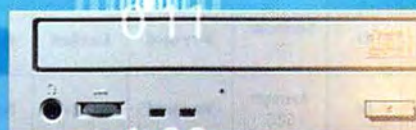
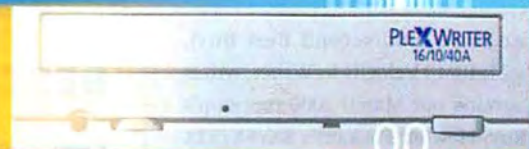
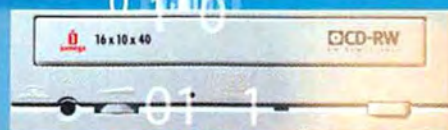
35 percent to 81 million in the next year.

According to IDC, CD-RW drives are most popular for saving data, digital images, and video, as well as for recording

audio CDs. CD-RW drives are also handy for copying CD-ROMs and for creating disaster-recovery discs so you can reboot and restore your hard disk drive.

CD-R and CD-RW have distinct advantages over other formats: Write-once CD-R and multiple-write CD-RW discs—both of which are available in 650MB or 700MB capacities—hold far more data than either 240MB SuperDisks or 250MB Iomega Zip disks can. And the media is sturdier and more reliable than ►

BY JON L. JACOBI
PHOTOGRAPHS BY GEOFF SPEAR



FROM TOP:
Imation 16x10x40,
Plextor 16/10/40A,
TDK 16/10/40 VeloCD,
Imation CRW1208A,
TDK 24/10/40 VeloCD,
Sony Double Density,
Yamaha CRW2200EZ,
Teac CD-W516E,
LG CED-B120B,
Sony CRX1611/82U.

removable cartridges such as Iomega's 2GB Jaz and Castlewood's 5.7GB Orb. But CD media's real ace in the hole is its compatibility: CD-R discs can be read by almost all of the installed base of 600 million CD-ROM drives worldwide, as well as by most current home audio and DVD players. CD-RW discs are less compatible with commercial audio-CD players and older CD-ROM drives than CD-R discs are. On the other hand, CD-RW media has one big advantage: You can write (and rewrite) to a disc up to 1000 times.

SPEED JUMP

NOT SURPRISINGLY, the near ubiquity of drives that can read CD media means that CD-R and CD-RW are fast becoming the de facto floppy disk replacement. And with such a huge market at stake, it's no wonder that manufacturers continue to raise the bar for performance. Our num-

ber two drive (and second Best Buy), TDK's 24/10/40 VeloCD ReWriter, writes rings around our March 2000 roundup's Best Buy, Hewlett-Packard's 8X/4X/32X CD-Writer Plus 9110i. TDK's 24/10/40—an internal drive, as are the other drives reviewed here—has a vendor-rated speed three times that of last year's HP at CD-R burning, and it's more than twice as fast at CD-RW recording. Though older, slower drives like the CD-Writer Plus 9110i are available at bargain prices, faster models have long since overshadowed them.

The three slowest drives to make our chart this time have rated speeds of 12X/8X/32X; five others are rated at 16X/10X/40X; and the remaining drives are our two Best Buys—TDK's 24X/10X/40X model and Yamaha's top-ranked 20X/10X/40X drive, the LightSpeed CRW2200EZ.

You may pay a little extra for faster performance, but CD-RW drives are more

BEST BUYS

Best Buy OUR TWO BEST BUY CD-RW drives, the \$230 Yamaha LightSpeed CRW2200EZ and the \$245 TDK 24/10/40 VeloCD ReWriter, are also the fastest drives we tested. You'll have to pay a little more for the higher level of performance, but these drives proved their worth in both audio and data CD burning tasks. Both CD-RW drives come with an impressive software bundle and a friendly user manual, too.

affordable than ever. Tight competition among manufacturers, coupled with the sluggish economy, is pushing prices lower and lower. Industry experts expect that by this fall we'll see 12X (CD-R rating) drives priced under \$100, 16X drives at \$149, and 24X drives at about \$200.

FEATURES

TEST Center

TOP 10 CD-RW DRIVES

| | CD-RW DRIVE | Overall rating | Street price (7/23/01) | Performance ¹ | Features | Installation | Support policies | Bundled software |
|----|--|----------------|------------------------|--------------------------|-----------|--------------|------------------|---|
| 1 | Best Buy Yamaha LightSpeed CRW2200EZ find.pcworld.com/11146 | 89 | Expensive: \$230 | Excellent | Excellent | Very good | Very good | Ahead Nero Burning ROM 5.5 and InCD 2.11; Neato Labeling; Adobe PageMill, PhotoDeluxe, and ActiveShare; MusicMatch Jukebox |
| 2 | Best Buy TDK 24/10/40 VeloCD ReWriter find.pcworld.com/11142 | 89 | Expensive: \$245 | Excellent | Excellent | Excellent | Very good | Ahead Nero Burning ROM 5.5 and InCD 2.12; Adobe Acrobat Reader and ActiveShare; MP-Frees; MusicMatch Jukebox; TDK Digital MixMaster |
| 3 | Plextor PlexWriter 16/10/40A find.pcworld.com/11130 | 88 | Average: \$185 | Very good | Excellent | Very good | Good | Adaptec Easy CD Creator 4.03 and Direct CD 3.03; Plextor Manager 2000 |
| 4 | TDK 16/10/40 VeloCD ReWriter find.pcworld.com/11141 | 88 | Average: \$180 | Very good | Very good | Very good | Very good | Ahead Nero Burning ROM 5.0 and InCD 1.75; MusicMatch Jukebox; Adobe ActiveShare |
| 5 | Sony CRX1611/82U find.pcworld.com/11136 | 87 | Average: \$200 | Very good | Very good | Very good | Very good | B's Recorder Gold 1.99 and Clip; Dantz Retrospect Express; MusicMatch Jukebox 2.12; ArcSoft PhotoBase, Photo Impression, and Video Impression |
| 6 | Iomega 16x10x40 Internal CD-RW find.pcworld.com/11128 | 87 | Expensive: \$210 | Very good | Excellent | Very good | Very good | Adaptec Easy CD Creator 4.03 and Direct CD 3.03; CD Ware; MusicMatch Jukebox; Adobe ActiveShare |
| 7 | Teac CD-W516E 16x10x40 CD-RW find.pcworld.com/11143 | 86 | Average: \$155 | Very good | Very good | Very good | Satisfactory | Roxio Easy CD Creator 5.0 and Direct CD 5.0 |
| 8 | Sony Double Density CRX200E/A1 find.pcworld.com/11138 | 86 | Average: \$190 | Good | Very good | Very good | Very good | Sony CD Extreme 1.5 and AbCD 1.6; Sony Sprezza Liquid Player; Dantz Retrospect Express |
| 9 | LG Electronics CED-8120B find.pcworld.com/11129 | 85 | Inexpensive: \$140 | Good | Very good | Very good | Very good | Adaptec Easy CD Creator 4.02 and Direct CD 3.01 |
| 10 | Imation CD Burn-R CRW1208A find.pcworld.com/11124 | 83 | Inexpensive: \$150 | Good | Good | Very good | Very good | Adaptec Easy CD Creator 4.02 and Direct CD 3.01; Out-of-Bounds MP3's; Apple QuickTime |

Overall ratings are based on performance (35 percent), price (25 percent), features (20 percent), tech support policies (10 percent), and ease of installation (10 percent). See find.pcworld.com/10860 for details on PC World's Star Ratings. ¹ See the test report on page 114 for actual performance results.



YAMAHA LIGHTSPEED CRW2200EZ (top) and TDK 24/10/40 VeloCD ReWriter.

This price war provides a great buying opportunity because eventually—perhaps by the end of the year—supply will level off and prices will creep back up, experts say. But even if prices stabilize, they may not stay that way for long: New technologies are just around the corner (see page 119).

BUYING SMART

WHEN YOU SELECT a new CD-RW drive, you'll need to weigh the product's price, features, support and reliability, and bundled software. To start your decision-making process, think about how you intend to use the drive.

For burning audio CDs, archiving data, or distributing data, fast CD-R write performance is paramount. Audiophiles should also consider how fast a drive can extract tracks from an audio CD, since fast digital audio extraction (also known as "ripping") can save you time when you create custom audio-CD mixes or add to your MP3 collection. If you already have a fast-extracting CD-ROM drive on your system, however, the audio extraction speed of a CD-RW drive is less important.

If data backup is your primary focus, CD-RW write speed means more to you than CD-R speed because you can repeatedly use the same CD-RW disc for backups—a cheaper solution in the long run than using CD-Rs. CD-RW speed is also important if you want to take advantage of Universal Disc Format (UDF) packet writing to use CD-RW discs as if they were giant floppies. If you prefer to use mastering software to write (and later erase) an entire CD-RW disc, the drive's write performance will closely resemble its performance with CD-R discs.

The latest 20X and 24X (CD-R rating) drives differ from previous generations of CD-RW drives in that their X-ratings represent only a maximum speed. Before this generation, all CD-RW drives used constant linear velocity to vary the spin rate of a disc so that data could be written at the same rate on the inner tracks of the disc as on the outer tracks. But the fastest of the new drives use one of two variations on this technology—Zone CLV or Partial CAV—that limit the top speed according to how far from the inner track the drive is writing data.

Most drives that write to CD-R at 16X or faster now include buffer underrun protection—a technology that's helped boost drive reliability significantly since our ►

GLOSSARY

CD Basics

THE NUMBERS that describe a CD-RW drive's rated performance speeds are easy to decipher. A 24X/10X/40X drive writes to CD-R discs at up to 24X, writes to CD-RW discs at up to 10X, and reads CD-ROM discs at up to 40X. CD X-ratings are multiples of 150 KBps—the transfer rate of a 1X CD-ROM drive or an audio-CD player.

Here are some more definitions of CD-RW terms you'll hear banded about:

Constant angular velocity (CAV): The result of spinning a disc at the same speed at all times. Data on the outer tracks of the disc is read or written faster than data on the inner tracks.

Constant linear velocity (CLV): The result of varying the spin rate of a disc so that data is read or written at the same rate on the outer tracks of the disc as on the inner tracks.

Image: A single file that's composed of all the files to be written to a disc. An image is handy when you're burning multiple copies of a CD.

Mastering: The process of gathering files from your hard disk and writing those files to a CD-R or CD-RW disc.

On the fly: Using a small hard-disk cache to write files to disc without first creating an image file; writing on the fly requires a faster system.

Packet writing: The process of writing data to a CD-RW disc in small blocks using the Universal Disc Format (UDF), which is supported by all contemporary operating systems. Packet writing allows you to treat a CD-RW disc as you would a floppy, so you can add and erase—as well as access—files at will.

Comments

This speedy drive blazed through our CD-RW tests (where it logged the fastest time)—and it was a fast CD-R writer too. It also has a terrific software bundle. ★★★★★

The vendor-rated CD-R write speed of 24X makes this the fastest drive on the market—and it shows in the drive's topflight performance in our tests. ★★★★★

Solid CD-R performance and the inclusion of drivers for drag-and-drop extraction of CD audio tracks make this an excellent pick for audio enthusiasts. ★★★★★

A good value at \$180, this drive comes with a handy installation video and useful music software; it's the fastest 16X drive at writing 650MB from an image. ★★★★★

Ranks as a good overall performer—in spite of its sluggish times for installing Office and writing an image to CD-R. Bonus: Includes backup software. ★★★★★

A good general-use model, this drive features easy installation and better-than-average digital audio extraction times. ★★★★★

Though not the fastest performer on our chart, this inexpensive drive is the only internal model we tested that uses Roxio's latest, Easy CD Creator 5.0. ★★★★★

Like the LG drive, this Sony model relies on an 8MB buffer instead of underrun protection. It is best suited for users who value additional capacity foremost. ★★★★★

This value-priced drive's large 8MB buffer makes up for its lack of buffer underrun compensation technology. Also has a sturdy tray mechanism. ★★★★★

A low price makes this drive a viable option for the budget-conscious, though its CD-R and CD-RW write speeds are slightly slower than average. ★★★★★

March 2000 roundup. A buffer underrun occurs when a CD-RW drive's buffer (or memory cache, typically 2MB to 8MB in size) runs out of data, and the drive must shut down its write laser—resulting in a coaster (techie slang for a bad disc).

Buffer underrun protection gives a drive the smarts to realign its laser and resume writing where it left off—virtually eliminating the chance of burning a bad disc. It also lets you freely use your PC for other tasks while you're recording a CD, since you don't have to worry about disrupting the burning process.

More than half the drives we looked at—and eight of the ten best drives—offer buffer underrun protection, using a technology such as Ricoh's JustLink, Sanyo's BurnProof, or Yamaha's SafeBurn. Sony's Double Density CRX200E/A1 and LG

Electronics' CED-8120B proved to be consistent burners in our tests, even though they use a large 8MB buffer in lieu of true buffer underrun protection. To gauge whether a drive's buffer underrun protec-

Buffer underrun protection lets you freely use your PC without disrupting the burning process.



tion works, we throw a number of tasks at our test system while we burn a disc.

Before settling on a drive, consider whether its included software suits your needs. All the drives in our roundup—and any drive you can buy off the shelf—include software such as Roxio's Easy CD Creator or Ahead's Nero Burning ROM, which can be used for creating audio and

data CDs and performing packet writing. However, some of these packages lack certain features, such as recording from an image, writing Video CDs, and writing a disc with CD Text. If a drive doesn't do

what you need out-of-the-box, you may want to upgrade. (See our review of CD-mastering software on page 129.)

In a few years, bundled CD-mastering and packet-writing software may grow less important as support for writing to both media gets integrated into other applications. Windows XP will include rudimentary CD-R-writing (but not packet-writing) functionality for audio and data based on the Roxio burning engine. And ECI's technology can be integrated into productivity applications, so users will be able to save files to CD without having to start a separate program.

BURNING RING OF FIRE

WE PUT THE 30 drives in our roundup through the wringer. Assignments included copying a 650MB image file, writing 650MB of files on the fly, using packet writing to copy 100MB of data files onto disc, installing Microsoft Office 2000 Small Business Edition, extracting audio from a music CD, and multitasking while burning a CD. All of these tasks and more were performed on our test system—a Dell Dimension 4100 Pentium III-933 with 128MB of RAM, running Windows 98 SE—and we enabled the IDE driver's direct memory access settings for drives whose manuals recommended it.

All 30 CD-RW drives we tested for our roundup are internal drives that use an IDE interface (if you're considering an external drive for portability, see "The Best USB ▶

TEST REPORT

TEST Center

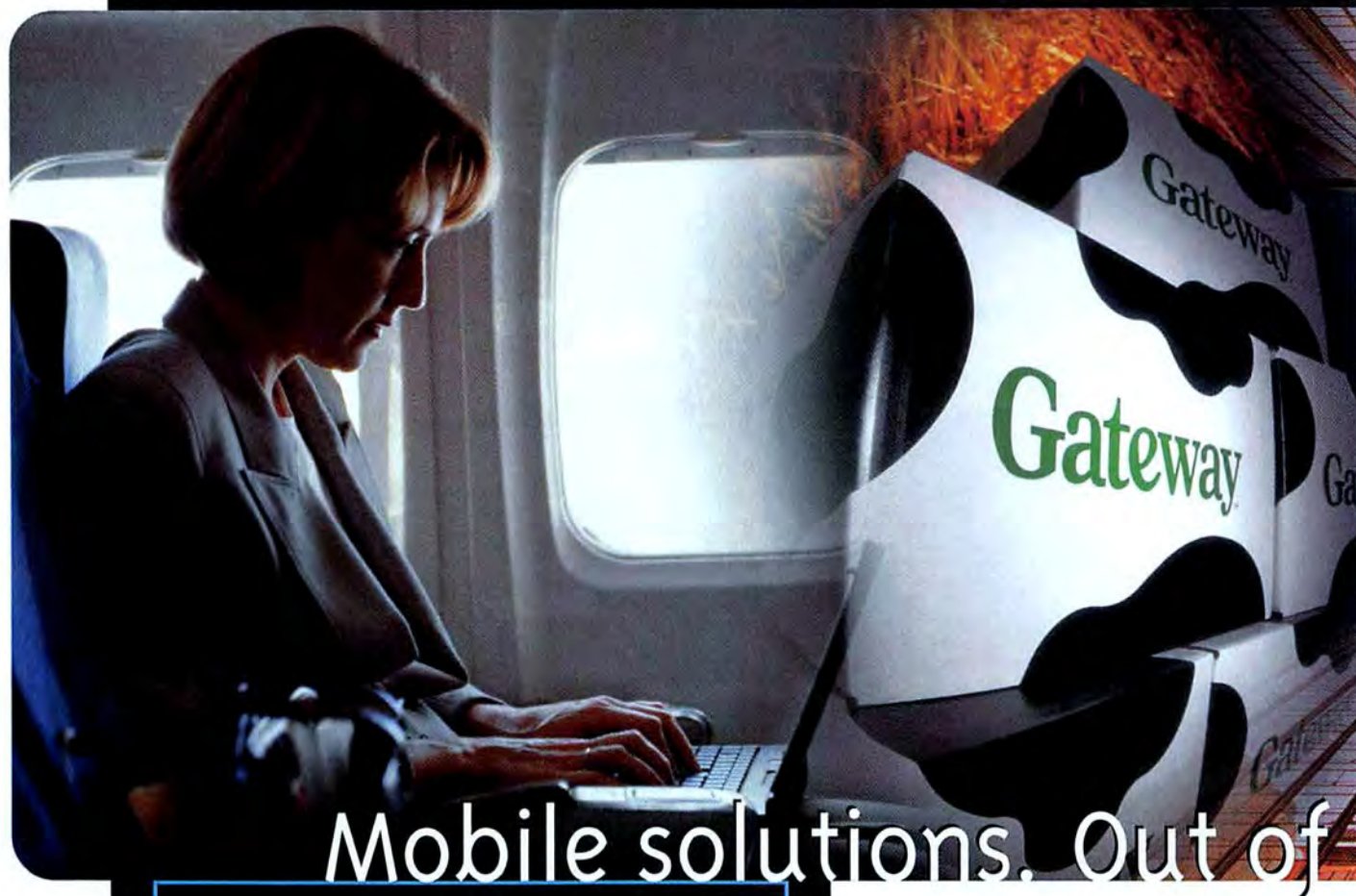
TOP 10 CD-RW DRIVES

| | CD-RW DRIVE | Rated speeds ¹ | Write 650MB to CD-R from an image/ on the fly (min:sec) | Write 100MB to CD-RW ² (min:sec) | Install Office 2000 (min:sec) | Digital audio extraction ³ (min:sec) |
|----|--|---------------------------|--|---|-------------------------------|---|
| 1 | Best Buy Yamaha LightSpeed CRW2200EZ find.pcworld.com/11146 | 20X/10X/40X | 4:41/4:49 | 1:16 | 3:48 | 1:47 |
| 2 | Best Buy TDK 24/10/40 VeloCD ReWriter find.pcworld.com/11142 | 24X/10X/40X | 4:00/4:12 | 1:20 | 3:33 | 2:00 |
| 3 | Plextor PlexWriter 16/10/40A find.pcworld.com/11130 | 16X/10X/40X | 5:35/5:38 | 1:49 | 3:38 | 1:58 |
| 4 | TDK 16/10/40 VeloCD ReWriter find.pcworld.com/11141 | 16X/10X/40X | 5:18/5:31 | 1:37 | 3:39 | 2:05 |
| 5 | Sony CRX1611/82U find.pcworld.com/11136 | 16X/10X/40X | 6:35/5:36 | 1:21 | 4:01 | 2:02 |
| 6 | Iomega 16x10x40 Internal CD-RW find.pcworld.com/11128 | 16X/10X/40X | 5:33/5:37 | 1:45 | 3:35 | 1:58 |
| 7 | Teac CD-W516E 16x10x40 CD-RW find.pcworld.com/11143 | 16X/10X/40X | 6:10/6:12 | 1:33 | 3:16 | 4:37 |
| 8 | Sony Double Density CRX200E/A1 find.pcworld.com/11138 | 12X/8X/32X | 7:03/7:13 | 1:54 | 3:32 | 2:55 |
| 9 | LG Electronics CED-8120B find.pcworld.com/11129 | 12X/8X/32X | 7:07/7:03 | 1:42 | 4:59 | 3:34 |
| 10 | Imation CD Burn-R CRW1208A find.pcworld.com/11124 | 12X/8X/32X | 7:26/7:42 | 1:53 | 3:43 | 3:03 |

HOW WE TEST: To gauge CD-ROM read performance we time how long it takes to install Microsoft Office 2000 SBE (disc one). To determine CD-R write performance, we burn data to CD-R discs from an image file and on the fly. We evaluate digital audio extraction speed by extracting 320MB of musical tracks from an audio CD to our hard drive. We measure CD-RW performance by copying 100MB of files to a CD-RW disc, then rewriting the same data to the same disc. ¹ Vendor's speed ratings, listed in order: CD-R write/CD-RW write/CD-ROM read. ² Using packet writing. ³ For 320MB of tracks.

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Drives," page 120). A handful of manufacturers, such as Yamaha, continue to offer SCSI drives, but most have phased out that connection interface since SCSI no longer offers a sizable performance gain.

We encountered only two unusual in-

stallation issues during our tests, both with TDK's drives. Though its performance and features boosted it into the number two spot on our chart, the TDK 24/10/40 VeloCD ReWriter wouldn't work to its full potential with our test system

until we downloaded the latest Intel IDE driver (version 6.10). Not every user will encounter this problem, however, and TDK does address the issue on its Web site. Meanwhile, oddly, we had to install TDK's fourth-place 16/10/40 VeloCD ▶

STORAGE

TAKING CAPACITY UP, UP, AND AWAY

IF YOU NEED MORE SPACE than the 650MB to 700MB a CD can hold, but you want the reliability of optical media, you may be ready for one of the higher-capacity technologies now available. DVD-RAM has been around for several years now, and faster, more-compatible solutions like Sony's double-density CD-R/RW and Pioneer's DVD-R/RW drives arrived on the scene earlier this year. Still to come are drives based on the long-promised DVD+RW standard and Calimetrix's exciting MultiLevel Recording technology.

Today the least expensive, most compatible route to greater optical capacity is our eighth-ranked drive, Sony's \$190, 12X/8X/32X Double Density CRX200E/A1. This CD-RW drive writes to Sony's specially formulated 1.3GB CD-R and CD-RW media, which are priced at about \$2 and \$3 apiece, respectively.

The proprietary double-density discs are more expensive than the 50-cent CD-R and \$1 CD-RW single-density media used by standard CD-RW drives, which the CRX200E/A1 can read and write to as well. But considering that each disc holds twice as much, the price is not unreasonable. As you'd expect with a new format, a double-density CD can be played back only on a double-density drive.

DVD-RAM may have enjoyed a three-year head start on the competition, but it hasn't made much of a splash in the optical storage pool—despite its enormous 4.7GB-per-side capacity. And it isn't going to catch on anytime soon: DVD-RAM's transfer rate is slow, about 700KBps or 4.5X with verification enabled, and the media is both costly (a 4.7GB disc costs \$35 to \$40) and incompatible with nearly all DVD-ROM drives and home DVD players. On the plus side, the media is rated for up to 100,000 rewrites, compared with the relatively modest 1000 rewrites promised by CD-RW and DVD-R/RW. DVD-RAM is a good choice only for people who plan to rewrite data repeatedly to a single disc and who don't need to share discs with others.

If cost isn't a concern for you, you'll love the speed, capacity, and flexibility of Pioneer's \$800 DVD-R/RW drive, the DVR-A03. Included in some systems from Compaq and Apple, this drive's \$10, 4.7GB DVD-Recordable discs can store home movies or still images that are viewable in the vast majority of DVD-ROM drives and home DVD players. DVD-Rewritable discs cost around \$20 and are great for backups, but they aren't as backward-compatible. The DVR-A03 writes to a 4.7GB DVD-R disc at a speedy 2.76 MBps, to a DVD-RW disc at 1.38 MBps, to CD-R at 8X, and to CD-RW at 4X. LaCie and QPS also offer DVD-R/RW drives.

After three years of tantalizing announcements, the DVD+RW drive technology from HP, Philips, and Sony is now promised for this fall, when HP is scheduled to release the first drive. DVD+RW uses a slightly different technological approach to carve out the same 4.7GB of rewritable storage that DVD-RW offers. Plus, its proponents claim that this format has even greater backward compatibility with home DVD players—though this remains to be seen. DVD+RW sounds promising, and Dell plans to offer systems with the new drive. But early adopters beware: It remains unclear which of the competing rewritable DVD standards will come out on top.

The technology that threatens to reshape the affordable optical storage market is Calimetrix's MultiLevel Recording. Not only does MultiLevel triple a standard CD's capacity to 2.1GB using readily available media technology, but it triples write speeds, too. MultiLevel works its magic by writing and reading marks made in eight color gradations instead of one, allowing the laser to read and write more information within the same space. Even better, MultiLevel drives will be backward-compatible (both reading and writing) with current CD media, so your existing stockpile of CDs won't be rendered obsolete. Mitsubishi Chemical, Panasonic, Plextor, Sanyo, and TDK are all on board the MultiLevel bandwagon. Products are due out in the first quarter of 2002.



PIONEER'S DVR-A03 (top) and Sony's CRX200E/A1.

ReWriter as master, not slave, on our test system, requiring some additional steps during setup (all of the other drives in this roundup were connected, or "slaved," to the system's existing CD-ROM drive). We

packet writing, using Adaptec DirectCD 3.0; QPS's Que CD-RW, which has the same hardware and software, performed similarly. Neither Yamaha nor QPS could provide a fix or an explanation for this

performance of our Best Buys, Yamaha's CRW2200EZ (rated at 20X/10X/40X) and TDK's 24/10/40 VeloCD. The three 12X drives that make the grade do so thanks to great documentation and either a bargain price (the ninth-ranked, \$140 LG Electronics CED-8120B and the tenth-ranked, \$150 Imation CD Burn-R CRW-1208A), or outstanding capacity (Sony's Double Density CRX200E/A1, in eighth).

We required that drives be available through October 2001 to be eligible for placement on this month's chart; this proviso disqualified several good performers (and good values) from our test batch of 30. But the models now in their sunset months have made past charts; go to find.pcworld.com/11340 to read more about CD-RW. Many of these drives will still be available through online retailers when you read this story; they'll probably be inexpensive too, since newer technologies—including the coming flood of 20X and 24X drives—will crowd the field. ►



The 12X drives that make the grade do so thanks to bargain prices or outstanding capacity.

had no difficulty installing the drive when it was slaved to another TDK CD-RW drive. TDK could not explain why that happened (and we've also seen it occur with drives from other vendors); most users should not have any difficulties.

With other drives, some aberrant test results indicated potential software compatibility issues. For example, the \$180 Yamaha LightSpeed CRW2100EZ took an abysmal 2 minutes, 44 seconds (about a minute longer than the average drive) to copy 100MB of files to CD-RW disc with

anomalous performance. All of Pacific Digital's drives performed poorly in our CD-RW write tests too, taking two to three times longer to write 100MB to disc using NTI FileCD. NTI confirmed that some CD-RW drives take longer than others to close a write session using FileCD.

THE SPEED PACK

DRIVES RATED AT 16X and faster (for CD-R) dominated our Top 10. Not surprisingly, drives like HP's 12X/8X/32X CD-Writer 9510i couldn't match the write

TEST REPORT

THE BEST USB DRIVES

IN SOME SITUATIONS, an external drive that users can share between computers may be just what the spin-doctor ordered. The main difference between external drives involves their interface.

We tested eight external drives, in each case using the drive's USB 1.1 interface—the most common interface on today's PCs. USB

drives are easy to install but don't run fast, due to USB 1.1's limited bandwidth. All eight external drives were significantly slower and many are more expensive than the internal drives in this roundup. Our top pick in this category—Micro Solutions' Backpack Triple Play CD-Rewriter— isn't the cheapest, but it is the most versatile.

| | EXTERNAL CD-RW DRIVE | Street price (7/10/01) | Rated speeds ¹ | Write 650MB to CD-R / Write 100MB to CD-RW ² | Comments |
|---|--|------------------------|---------------------------|---|--|
| 1 | Best Buy Micro Solutions Backpack Triple Play CD-Rewriter find.pcworld.com/11182 | \$250 | 4X/4X/6X ⁴ | 19:56/3:41 | It's not particularly pretty or portable, but this reasonably priced hot-pluggable drive is a good choice for notebook users, as it can achieve faster speeds with the bundled PC Card cable. The drive also connects to a USB or parallel port. ★★★★★ |
| 2 | Sony Digital Relay CRX10U/A2 find.pcworld.com/11137 | \$300 | 4X/4X/6X | 20:34/3:35 | The sleekest, most portable drive we tested, this pricey USB unit can run off a standard Sony camcorder lithium battery. It also has an 8MB buffer to eliminate skips during audio CD playback, and can play MP3 CDs too. ★★★★★ |
| 3 | Hewlett-Packard CD-Writer 8230e find.pcworld.com/11181 | \$185 | 4X/4X/6X | 20:06/3:17 | HP took the time to give its full-size USB drive a more rounded, attractive case. This bulky model would work best on a desk, not on the road. Its bundled software doesn't support writing from an image file. ★★☆☆☆ |
| 4 | Acer Mini-RW 6424MU find.pcworld.com/11180 | \$199 | 6X/4X/6X ³ | 20:36/3:36 | Despite CD-R performance slower than the vendor's speed rating, this drive wins points for its compact form and its optional PC Card (\$43) and IEEE 1394 (\$59) connections. The only external drive we tested with buffer underrun compensation. ★★★★★ |
| 5 | Imation CD Burn-R 4x4x6 find.pcworld.com/11125 | \$150 | 4X/4X/6X | 20:09/3:34 | Imation doesn't do anything to dress this drive up; essentially an internal drive with a USB interface and a plain-vanilla chassis. It's also the cheapest external on the block. ★★★★★ |

HOW WE TEST: To gauge CD-ROM read performance we time how long it takes to install Microsoft Office 2000 SBE (disc one). To determine CD-R write performance, we burn data to CD-R discs from an image file and on the fly. We evaluate digital audio extraction speed by extracting 320MB of musical tracks from an audio CD to our hard drive. We measure CD-RW performance by copying 100MB of files to a CD-RW disc, then rewriting the same data to the same disc. All five ranked drives earned overall ratings within one point of each other. Overall ratings were based on performance (35 percent), price (25 percent), features (20 percent), tech support policies (10 percent), and ease of installation (10 percent). See find.pcworld.com/10860 for details about PC World's Star Ratings. ¹ Vendor's speed ratings, listed in order: CD-R write/CD-RW write/CD-ROM read. ² From an image; time in min:sec. ³ Using packet writing; time in min:sec. ⁴ Drive rated at 8X/8X/24X when it uses included PC Card interface. ⁵ Drive rated at 6X/4X/12X when it uses included PC Card interface, and 6X/4X/24X when it uses IEEE 1394 interface.

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Our number one drive and Best Buy is Yamaha's 20X/10X/40X speedster, the \$230 LightSpeed CRW2200EZ. This unit was the fastest drive on the chart at using packet writing to copy data to CD-RW and at extracting digital audio; it was the second-fastest at writing our 650MB test

image to CD-R. The CRW2200EZ finished a disappointing eighth in installing Microsoft Office, but that wasn't enough to prevent it from capturing the top spot. Yamaha enhances the drive's appeal with a terrific software bundle: Ahead Nero Burning ROM, Adobe PageMill, Adobe

PhotoDeluxe, and MusicMatch Jukebox.

Nipping at the LightSpeed's heels is our other Best Buy, TDK's \$245 24/10/40 VeloCD ReWriter. This roundup's fastest overall performer, it wrote our 650MB image file to CD-R in 4 minutes—more than 40 seconds faster than the Yamaha

CD MEDIA

AMAZING TECHNICOLOR MEDIA

GOLD, SILVER, BLUE, GREEN... How does color affect the longevity of CD recording media—and the integrity of your data? Read on.

A CD-R disc has a reflective layer and a dye layer. The composition of the reflective and dye layers might influence the disc's longevity, but considerable debate persists over which combinations will last longer, and for how long. Accelerated life tests—necessary since CD-Rs have been around only for the past decade—suggest that a CD-R disc will last between 60 and 100 years at room temperature, inside a dust-free jewel case, at normal or low humidity, with no exposure to UV rays or sunlight (which can cause the dye to fade).

The color of the disc's writing surface will vary based on the combination of the dye and the reflective layer used. While many experts believe that a gold (colored) reflective layer will last the longest, few vendors use gold any longer—except in their premium discs. Today's silver reflective layers are considered by many to be as good as if not better than gold. A silver reflective layer is less expensive to produce, and it has a higher reflectivity value than gold, making it inherently more compatible with the lasers currently being used in CD-RW drives.

The vast majority of CD-Rs sold today use a silver reflective layer and phthalocyanine dye. (Some disc manufacturers use a silver reflective layer with silk-screened gold coloring on top of that.) Also popular are cyanine dye and Azo dye (distributed by Verbatim and used in the mass production of DVD-Rs).

The latest manufacturing trend is to make CD-Rs more fashionable by producing them in different colors, ranging from bright red to sleek black. Disc producers start with a colored plastic disc and then apply the reflective layer and the dye to it. Opinions differ as to whether colored media will affect the reliability and longevity of the disc. Black discs are generally accepted to be on par with standard silver discs in both reliability and longevity.

Reusable CD-RW discs have a shorter life span—estimated at 30 to 50 years, if you record to them many times. But they're more rugged than CD-R discs: Their phase-change dye layer renders CD-RW discs less sensitive to light and heat than regular CD-Rs.

SHOPPING TIPS

WHEN BUYING CD-R MEDIA, you should treat the speed rating as your primary concern. There is some room to be flexible, though:

we've successfully written at 16X to older 4X-rated media and we've used 16X-rated media to write at 20X. For

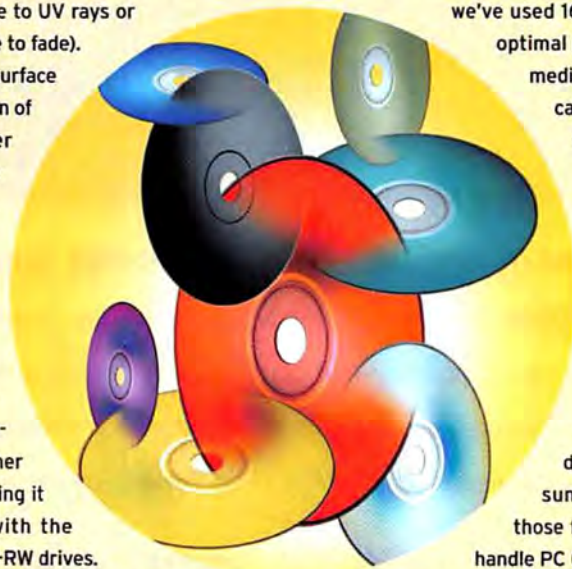
optimal performance, you're best off buying media rated at least as fast as your drive can handle. This is especially true of the newer 20X and 24X drives, since dye reaction time is more important in these fast drives. Moreover, discs rated to write CD-Rs at 24X have different dye formulations than do lower-rated CD-Rs.

Be wary of CD-R discs labeled as being specifically for music or audio use: Though they work fine with computer CD-RW drives, such discs are intended for use with consumer audio-recording decks—such as those from Pioneer and Philips—which can't handle PC CD-R media. These discs are stamped with a code that identifies them as music CD-Rs; and

their price is higher than standard CD-R discs, since the media manufacturers pay a 3 percent royalty to the U.S. Copyright Office.

Common 80-minute, 700MB discs will work most of the time because of the leeway built into the laser mechanism of many drives. You may, however, encounter drives or consumer audio players that can't read the extra data. Despite the popularity of 80-minute discs, the official industry standard for discs remains 74 minutes of audio run time and 650MB of data capacity.

If you're planning on archiving data, we recommend buying certified discs, which are subjected to more-rigorous quality control than the generic-branded media you'll find in a 50-spindle pack.



CRW2200EZ, and over a minute faster than the average 16X-rated drive. The 24/10/40 VeloCD took only 4 minutes, 12 seconds to write the same 650MB on the fly—37 seconds less than the Yamaha and over a minute less than the average 16X-rated drive. The drive kit comes with a great software bundle and has one of the best installation routines we've seen (including a how-to video).

Plextor's \$185 PlexWriter 16/10/40A is a strong third thanks to easy installation, good performance, and a well-deserved reputation for reliability and media compatibility. Another plus is the PlexWriter's excellent software bundle: It includes Plextor's AudioFS drivers—for extracting audio via the standard Windows interface—which are part of Plextor Manager 2000, a handy system tray toolbox.

In fourth is TDK's \$180 16/10/40 VeloCD ReWriter. A strong all-around performer, this drive was hurt by an installation glitch (discussed earlier) that forced us to install the drive only as master.

Our fifth-ranked drive is Sony's \$200 CRX1611/82U, another general-use 16X/10X/40X drive. This model's most noteworthy feature is its inclusion of excellent software for backing up your system.

BEST DRIVES FOR AUDIO USE

MUSIC LOVERS need a drive that has good CD-R write performance, fast audio extraction, and support for CD Text (the song title, artist name, and other information that displays on CD Text-enabled players). CD Text eliminates the need to search an online database every time you play a CD on your computer, and it's convenient if you lose the disc's jewel case.

Standouts for audiophiles are the 16X/10X/32X and faster drives from Plextor, TDK, and Yamaha. All feature fast audio extraction, and support for CD Text; Yamaha adds an audio cable you can attach to an external source, such as a tape player, while TDK offers its Digital MixMaster audio software. Plextor's AudioFS software makes it easy to extract individual tracks from an audio CD by using Windows Explorer—an enticing feature when

coupled with the drive's second-place digital audio extraction time. Still, we give the nod in this category to the faster TDK 24/10/40 VeloCD ReWriter; not only is it fast, but it carries its own audio utility.

BEST DRIVES FOR BACKUP

YOU HAVE EVEN more good CD-RW choices if you plan to use your drive mostly for backing up data. Since 10X is as fast as any current drive can write CD-RW, you can opt for a priced-to-move 12X/10X/32X drive without feeling that you're buying a hopelessly outdated model.

Our top choice for a drive to use for system backups is Sony's Double Density CRX200E/A1. Sony stands out from the pack because it includes the complete version of Dantz's Retrospect Express (which is the only program most users need to keep their data safely backed up) with its 12X and 16X drives. This software also supports disaster recovery, so you can restore your boot partition to its original state. Subtract the \$50 retail price of Retrospect Express from the street price of Sony's drives, and they become an outstanding value.

Besides shipping with backup software, Sony's Double Density drive supplies 1.3GB of space on each of its double-density discs—thereby halving the disc swapping required during the backup process. Our only complaint is that the drive writes CD-RW at only 8X—though it outperformed like-rated drives. If speed is your game, step up to the 10X CD-RW rating of Sony's 16X CRX1611/82U. ■

San Francisco-based freelance writer Jon L. Jacobi contributes regularly to PC World. PC World Test Center analyst Thomas Luong conducted all performance tests.

BURNING TIPS

Slash and Burn

IF YOUR CD-RW DRIVE acts more like a coaster factory than the reliable burner it should be, try these tricks gathered from CD-writing pros.

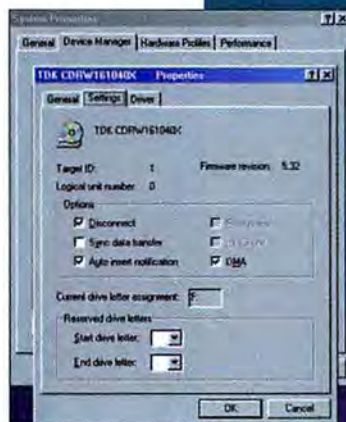
Don't interrupt the write process. Turn off Auto Insert Notification in *Control Panel\System*Device Manager*CDROM*Your Drive*Properties*Settings*. The better mastering software packages offer to do this step for you.

Turn on DMA. While you have the CD-ROM settings open, enable direct memory access (unless your documentation specifically warns

against it). Nearly every drive made in the last two years will read faster and burn more accurately with DMA enabled. If possible, switch on DMA for your hard drive as well. Some IDE bus drivers automatically enable DMA, in which case you may not see an option for this or the box will be grayed out.

Keep your BIOS current. Update the BIOS for your CD-RW drive; most vendors offer an update on their Web sites. Check with the drive's vendor to see whether it recommends updating your system drivers, including the IDE drivers and motherboard BIOS, in order to achieve optimal performance.

Burn just one file. On slower systems, defragment your hard drive and then create an image file to write your disc from. A single contiguous image file on the hard drive reduces data-flow glitches caused when the hard drive seeks numerous small files.



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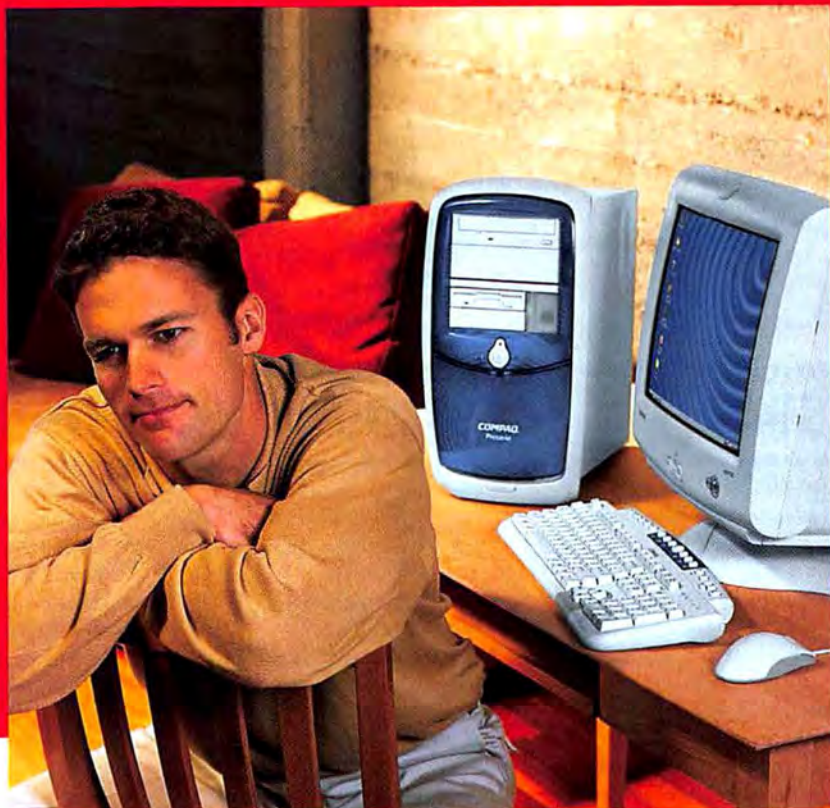
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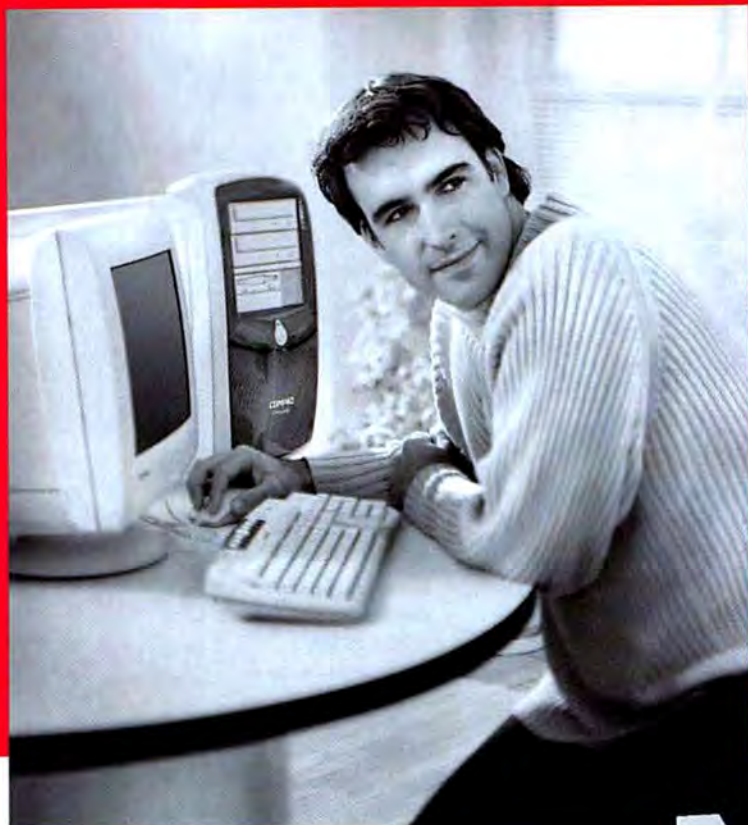
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achievable download transmission rates are currently unknown, may not reach 56 Kbps, and will vary with line conditions. *16X DVD-ROM drives read a minimum of 5545 Kbps and a maximum of 21540 Kbps. †These PCs meet the minimum hardware requirements to run Microsoft Windows hardware drivers. Free Windows XP Home Edition offer eligible on purchases of a Compaq Presario 5000T. Offer valid from 09/01/01 through 09/24/01. Shipping and handling included. See www.compaq.com/winupgrade for rebate coupon. To qualify for this offer, you must be a legal U.S. resident 18 years of age or older. Promotion is void where prohibited or restricted by law. Compaq reserves the right to modify or withdraw this promotion at any time. Microsoft® Windows® Millennium Edition installed. Compaq, the Compaq Logo, Presario, and Inspiration Technology are trademarks of Compaq Information Technologies Group, L.P. Intel, the Intel Inside Logo, Pentium, and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft, MSN, and Windows are registered trademarks of Microsoft Corporation. Products and company names mentioned herein may be trademarks and/or registered trademarks of other companies. ©2001 Compaq Computer Corporation 9876/10/01

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Better Burning

BY MELISSA J. PERENSON PHOTOGRAPHS BY GEOFF SPEAR



A CD-RW drive is only as good as its software. We take five feature-rich mastering packages for a spin.

SO YOU'VE PURCHASED a CD-Rewritable drive—maybe one of those reviewed in our roundup on page 110? What you can do with your drive depends on the software that runs it. Often, the software bundled with the drive provides only basic functions such as burning data to a CD-R or performing packet writing. And that bundled software may be a somewhat older or stripped-down version; for example, many drives this summer were shipping with Adaptec Easy CD Creator 4.0, the predecessor of Easy CD Creator 5. Drive vendors may also bundle their own, branded programs; Hewlett-Packard, for instance, supplies its basic HP MyCD software with its drives.

Whether you're a neophyte who values simplicity or a power user who wants more features and more control, changing your software can help you to get the most out of your new or existing CD-RW drive.

Is such an upgrade worthwhile? The answer is a conditional yes. ►

If you simply want to write computer data onto a CD-R or CD-RW disc, the package bundled with your drive may be sufficient. On the other hand, if you want to do more than that (such as making audio CDs from digital audio files) or if you find the bundled software difficult to use, the programs we review here can supply the features you need and make the process of burning discs easier.

With upgraded software, a CD-RW drive can do so much more than straightforward data backup. For example: Easy CD Creator 4.0 Standard (bundled with many drives) can't edit audio tracks or create Video CDs, but the 5 Platinum version can do all that and more. And whereas NTI's CD-Maker 2000 (bundled with 16X/10X/40X Pacific Digital drives) won't allow you to make MP3s from CD audio or record live audio, the same company's CD-Maker Professional Edition will.

But a CD is a CD is a CD...right? Not exactly. You can use a variety of CD formats and pick from a plethora of options as to how to burn them. A multisession CD, for example, lets you add data to a disc after the first burn. Other formats include Mixed-Mode CD (which stores audio first and data second, letting you play the disc on a CD player and read the

SIMPLI THE BEST

Best BUY SIMPLICD ISN'T the most powerful or the most full-featured product in our roundup, but it balances form and function very well. And at \$65 (\$50 for the downloadable version), it's a reasonably priced upgrade.

data on a CD-ROM drive); the aforementioned Video CD format, which enables you to store up to 1 hour of MPEG-1 compressed video on a standard CD; Macintosh-compatible HFS CD; and hybrid CDs (which can be read on both PCs and Macs). Many of the basic packages that come with CD-RW drives omit some or all of these specialized formats.

BURNING TALES

FOR THIS REVIEW, we tested the speed of writing data to a CD-R disc using each of the programs, but we found the programs' speed differences to be minimal. So we judged the programs on features

and ease of use. We did not test the speed of writing to a CD-RW disc.

Although all of the programs we reviewed perform most of the same tasks, each has a different range of features. Stomp's \$50 Click'N Burn 2.0 is the least

expensive product, while the priciest is Roxio's \$80 Easy CD Creator 5 Platinum (Roxio is an Adaptec spin-off company). Rounding out the field are Oak Technology's \$65 SimpliCD, Ahead's \$69 Nero Burning ROM 5.5, and NTI's \$70

CD-Maker Professional Edition.

Most of today's CD-RW drives conform to the industry-standard Multimedia Command set. MMC determines how the software controls the drive, so any CD-RW mastering program should work with almost any drive. However, the software will take advantage of a drive's full capabilities only if it supports that drive; with such support, the software can understand how to use specific features, such as buffer underrun compensation technology (discussed in "CD-RW ASAP" on page



SOFTWARE FEATURES

CD-RW MASTERING PACKAGES COMPARED

| PROGRAM | Street price (7/6/01) | Wizard to create data or music CD | Disc-at-once/track-at-once CD copy | Audio encoder (MP3/WMA) | Sound editor | Creates audio CD from MP3s | Creates Video CDs | Supports bootable CDs/hybrid CDs | Packet-writing software | CD database source |
|---|-----------------------|-----------------------------------|------------------------------------|-------------------------|--------------|----------------------------|-------------------|----------------------------------|-------------------------|--------------------|
| Ahead Nero Burning ROM 5.5 find.pcworld.com/10984 | \$69 | ● | ●/● | ○/○ | ● | ● | ● | ●/● | INCD | Freedb |
| NTI CD-Maker Professional Edition find.pcworld.com/10983 | \$70 | ● | ●/● | ●/○ | ● | ● | ● | ●/○ | FileCD | Freedb |
| Best BUY Oak Technology SimpliCD 1.0 find.pcworld.com/10982 | \$65 ² | ● | ●/● | ●/● | ○ | ● | ● | ●/● | SimpliCD ReWrite | Gracenote |
| Roxio Easy CD Creator 5 Platinum find.pcworld.com/10980 | \$80 | ● | ●/● | ●/● | ● | ● | ● | ●/● | DirectCD 5 | Freedb |
| Stomp Click'N Burn Pro 2.0 find.pcworld.com/10981 | \$50 | ● | ●/● | ○/○ | ● | ● | ○ | ○/○ | Veritas DLA | None |
| Adaptec Easy CD Creator 4.0 Standard | Bundled | ● | ●/● | ○/○ | ○ | ○ | ○ | ●/● | DirectCD 5 | Freedb |

● = Yes ○ = No

¹ Includes demo version of MP3 encoder that encodes only 30 files; full encoder costs an additional \$15.

² Boxed version; downloadable version costs \$50.

110). It's a good idea to visit a software vendor's Web site and see if your drive is supported before you buy a package.

In our tests, we found that the best overall package was Oak Technology's SimpliCD 1.0—it's the winner of our Best Buy award. Close behind SimpliCD is Stomp's Click'N Burn 2.0, a powerful program with an easy-to-follow interface, although some of its features (such as burning a CD from a hard-disk image) are clumsy to use. The streamlined interface of NTI's CD-Maker Professional Edition helps that program do a better job of burning from an image, but it doesn't do a good job of creating audio CDs, as you can't shift tracks around once you add them to the burn queue. Power users who want complete control over the burning process may prefer Ahead's Nero Burning ROM 5.5. Roxio's Easy CD Creator 5 Platinum offers the largest number of features, but it is the most expensive package we reviewed.

Ahead Nero Burning ROM 5.5

What's Hot: The strangely named Nero Burning ROM 5.5 offers a vast number of options, all of which the well-written help

file covers. For example, the program enables you to write to hybrid CDs and to Macintosh-compatible HFS CDs, and it has an integrated MPEG-1 encoder for creating Video CDs. Other features include Nero Imagedrive, which creates a virtual CD-ROM drive that lets you view the contents of an image file without having to burn the image to disc.



THE DIGITAL MEDIA RECORDER component of SimpliCD has a rigid interface that some users may find confusing.

What's Not: The wizard that takes you through the burning process points you in the right direction but still leaves you mostly on your own in a sea of bewildering options. Between the complex interface and the project wizard, you frequently end up clicking through numerous screens to do tasks that other programs let you do in one or two screens.

What Else: Nero Burning ROM 5.5 comes with an MP3 encoder, but it will encode only 30 files in total. To do more, you have to buy the full version of the encoder, which costs \$15 extra.

Upshot: Users who want flexibility and don't mind a challenging learning curve will get the most out of this program.

NTI CD-Maker Professional Edition

What's Hot: Every task in CD-Maker Professional Edition uses the same simple, two-step interface, which keeps things easy. Drop-down menus for the source and destination drives make this software the least complicated means of copying a CD. The program also allows you to save

an image of a CD to your hard disk and then burn that image to another CD.

What's Not: You can't simply click on audio track names or file names and edit them directly while they're queued for recording; instead, you have to right-click on each track, select *Properties*, and then edit the name in that window.

What Else: The program requires you to turn off Windows' auto-insert feature, which tries to run a program from a disc when you insert it (other packages either don't require that auto-insert be turned off or automatically disable the feature). In addition, the software enables its write-verify option by default, which lengthens the time to burn a CD but tells you whether the procedure succeeded or not. To disable this default, you must hunt around under a menu. When you record from audio inputs (such as a tape player connected to the line-in socket of the sound card), the audio is recorded to the hard drive as a .wav file or directly to the CD-R.

Upshot: CD-Maker's user-friendly interface is a major plus for beginners and for those who don't want to click through multiple screens to get the job done.

Oak Technology SimpliCD 1.0

Best Buy **What's Hot:** SimpliCD takes a different approach to creating data CDs. While the other programs make you select the data to put onto the CD from within their interfaces, SimpliCD puts a "SimpliCD ROM" folder on your desktop that you can access through Windows Explorer. When you find a file you want to copy to a CD, you either drag and drop the file into this folder or right-click on the file and select the *Send To* command. When you're ready to burn the disc, open the folder, click the burn button on the toolbar at the top of the screen, and follow the simple instructions.

What's Not: Although SimpliCD has enough features to satisfy most users, it doesn't give you the level of control over every aspect of the burning process ▶

| | Comments |
|--|---|
| | Plenty of features to control every aspect of the burning process, but it has a poor interface, and a full-version MP3 encoder costs extra. ★★★☆☆ |
| | Can record live audio direct to CD, and includes filters for enhancing audio from vinyl or tape. No support for hybrid CDs. ★★★☆☆ |
| | Very easy to use and has a straightforward interface. Integration into Windows makes creating data CDs a breeze. ★★★★★ |
| | SpinDoctor component enhances sound recorded from vinyl LPs or tape, but various components have different interfaces. ★★★☆☆ |
| | Relatively easy to use, but no Video CD encoder or CD track information. Can burn to up to four drives simultaneously. ★★★☆☆ |
| | Bundled with a range of drives. Many features are missing or are easier to use in other software packages. |

that Nero Burning ROM does. The only downside to the interface is its colorful Digital Media Recorder, which is fixed in size and doesn't make viewing full audio track and title names easy.

What Else: Context-sensitive help walks you through spots you don't understand. You can access tasks—such as making a Video CD or slide show, ripping digital audio from a CD, or creating an audio CD—from the Windows system tray. When you make audio CDs with songs from multiple CD sources in guided compilation mode, the application stores the songs temporarily on your hard disk so you don't have to swap discs.

Upshot: SimpliCD's unique approach makes burning discs a more intuitive process. The program is easy enough for neophytes to learn, yet it will appeal to experienced users as well.

Roxio Easy CD Creator 5 Platinum

What's Hot: Version 5 Platinum features a sleek, revamped interface with an easy-to-navigate project selector for choosing what type of disc to burn. You'll also find

plenty of audio-specific features: an MP3 encoder to convert CD audio to MP3; a normalizer that can help moderate the loudness of the tracks in a batch; a sound editor; and Spin Doctor, which the company claims will clean up the clicks, pops, and hisses you sometimes encounter when recording from vinyl or tape. The MP3 CD Project feature automatically generates a playlist, in .M3U format, for CD players that can play MP3 files. The software supports Video CD creation, but you must use a separate, included application to perform the video encoding.

What's Not: The full installation of Easy CD Creator 5 Platinum takes a whopping 220MB of hard disk space. For the program to remember your settings between sessions, you may need to download an upgrade patch. You also have to use different interfaces for different tasks; that can be confusing when you switch between tasks. To make audio CD mixes, you must swap your source CDs throughout the burning process—Easy CD Creator can't copy the audio tracks temporarily to your hard disk.

What Else: If you're

seeking artist and track data for audio CDs, you need to download a patch as well, because Roxio switched from supporting Gracenote's online CD database to supporting Freedb's. Be sure to check Roxio's Web site for another patch before using the software with Windows 2000: A bug in the shipping version caused problems on some systems that users could fix only by reinstalling Windows 2000.

Upshot: Home users who plan to record CDs with tracks extracted from alternate sources (such as vinyl) will get the best value out of Easy CD Creator.

Stomp Click'N Burn Pro 2.0

What's Hot: Click'N Burn 2.0's interface is a good compromise between simplicity and power. The starter wizard lets you easily pick the type of disc you want, with options for audio CD, data CD, and CD copying. A sound editor is included.

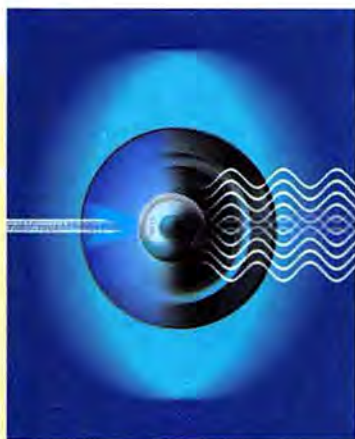
What's Not: The option for converting a disc into an image file is hidden in right-click menus. The software doesn't include an MPEG-1 encoder for Video CDs.

What Else: The menu and right-click options are context sensitive, so you get only the choices appropriate to the particular screen you're viewing. The \$50 Click'N Burn Pro 2.0 supports writing to as many as four drives simultaneously—a boon for people who need to produce lots of CDs for distribution.

Stomp also produces a \$20 cut-down version called Click'N Burn Plus; it lacks some capabilities, such as creating Video CDs and recording live audio to CD.

Upshot: A strong runner-up, Click'N Burn Pro 2.0 is a good fit not just for consumers but also for business users who have multiple CD-RW drives. ■

Melissa Perenson is a PC World associate editor who regularly covers CD-RW topics.



BURNING AUDIO CDS

RIP IT UP AND MIX IT UP

ONE POPULAR APPLICATION of CD-RW drives is to create custom music-mix CDs by ripping (that is, reading the digital data off individual tracks) from audio CDs and burning the tracks onto a CD-R disc. All the applications we reviewed can handle this job (as can some that come bundled with the drives), but if this is all you want to do, you can get by with one of several cheaper options.

MusicMatch Jukebox Plus 6.1 (find.pcworld.com/11200) costs \$20 and can rip audio files and create mix CDs. It also has a sound equalizer, a playlist editor, and a printing utility for making CD labels and jewel-case covers.

RealJukebox 2 Plus (find.pcworld.com/11201) packs a lot for \$30. It can burn audio CDs too, though you must download a free plug-in to handle this. The software allows you to fade one song into another; and like MusicMatch Jukebox, it offers CD-label and jewel-case-cover printing. Microsoft's Windows Media Player 7 (find.pcworld.com/11202) is free and supports CD burning, but it isn't as versatile as the other two packages.

The \$17 shareware program MP3 CD Burner (find.pcworld.com/11203) lets you trim silences or implement fades between songs, and it can create playlists in .M3U and .PLS formats for CD players that can play MP3 files from a CD-R disc. MP3 CD Burner's biggest drawback: The software won't print CD labels or jewel-case covers.

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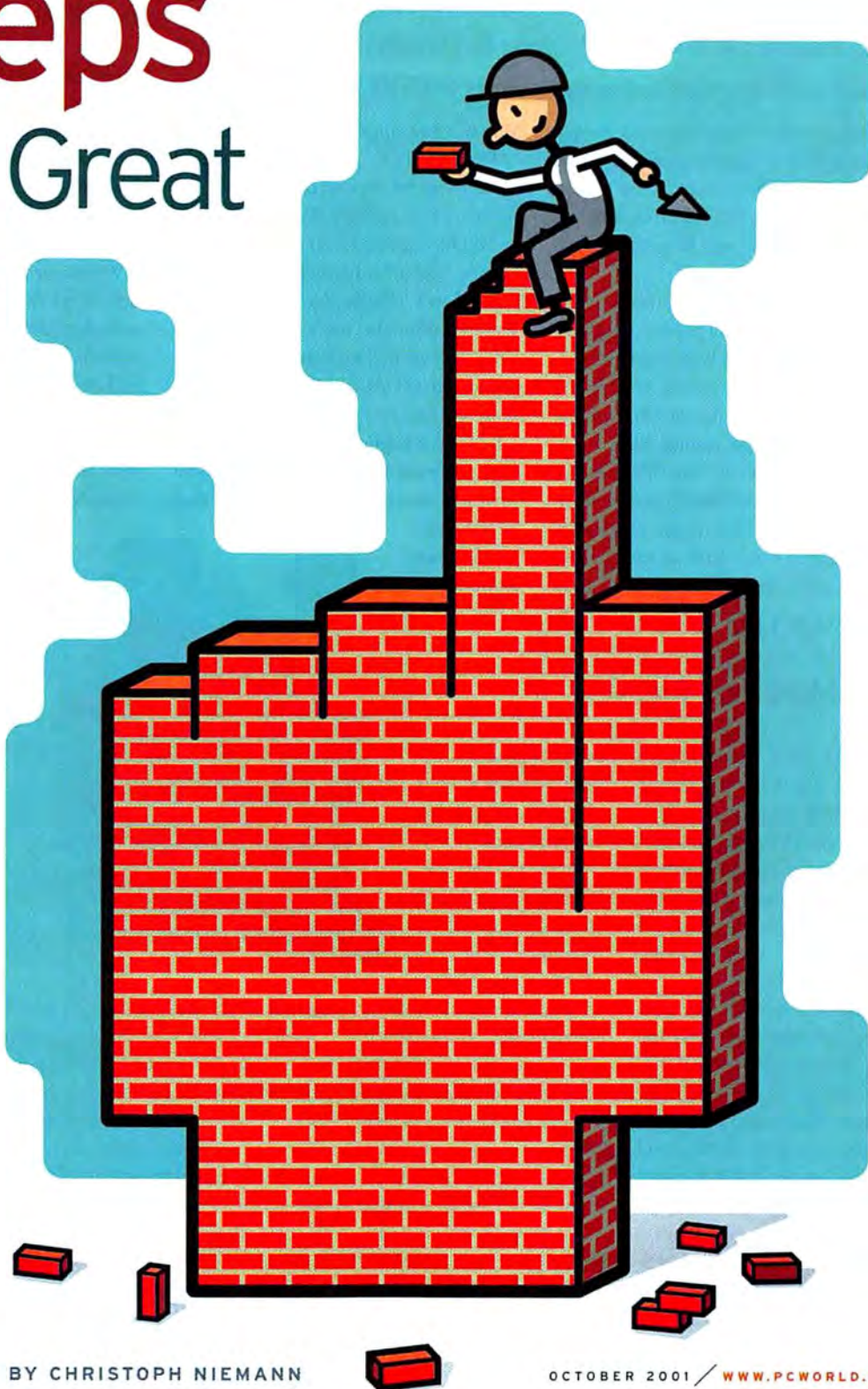
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Easy Steps to a Great Site

Tips, tricks, and tools that will help you spruce up a dowdy home page—or build a brand-new one. ►

BY DENNIS O'REILLY



Next year the World Wide Web will reach its 13th birthday, which in Internet years is pushing middle age. The Web is no longer a novelty—it's a part of everyday life. And that makes it both easier and harder to establish yourself online, whether for personal or for professional reasons. Building a Web site is easier these days because of the profusion of high-quality Web tools and services, many available at little or no cost.

But it's also more difficult because simply having a Web site isn't enough anymore. Your site has to be *good*, and it has to keep growing. In fact, maintaining and upgrading your site may be greater challenges than creating it.

If you're just starting out, this month's *Step-By-Step* (page 196) provides a primer on building a simple Web page. But getting that first page posted is only the beginning. It's the upgrades to your site that will keep people coming back.

That's where we can help. We created a basic Web site (see **FIGURE 1**) and beefed it up with a message board, two JavaScripts (a navigation menu and an image slide show), and a shopping cart (see "Road

Map to a Site Upgrade" on page 139).

We created our 11-page Web site and got it online for the cost of a Web hosting service, which handled the registration of our domain name for an additional \$32 (see the sidebar "A Host of Hosts" below). We did not have to use any advanced Web-development tools or techniques, either. All we had to do was tweak some preexisting HTML and JavaScript (see "A Mini Site Makeover" on page 138).

Before you begin building pages, decide who you want to bring to your site and what you want them to do there. The goal of our simple site was to introduce

people to potential pets currently housed in shelters. The steps we followed are applicable to all sorts of business and personal sites, however.

Think of site visitors as your guests. The design of your site should make them feel welcome and should help them find the information they're looking for quickly. That's why the interface and navigation elements are so important, even on a site that consists of just a handful of pages. Prioritize the information and services you want to offer your visitors, and make the most important ones easiest to get to.

We planned five sections for our make-believe site, each of them accessible with a single click from the home page or from any other section. All 11 pages on our site include links to the home page and to the top levels of the other sections.

Consider how people will move through your site. Web professionals create "user scenarios" that describe different types of site visitors. In our example, a young couple looking for

HOSTING TIPS

A Host of Hosts

EVERY SITE needs a good home. And the quality of your Web host can mean the difference between putting up with a slow, banner-laden site and enjoying a speedy, reliable home page. Here are a few things to keep in mind when you evaluate Web hosting options.

Reliability is key: Free hosting services rarely offer the level of reliability and technical support that fee-based services provide; and the ubiquitous pop-up ads, banners, and other detritus that free services place on your visitors' screens are a real nuisance. Many of the ads that they display are stickier than leather

car seats in August, lingering on top of your site visitors' screens during scrolling.

Check with your ISP: Many ISPs offer limited Web hosting as part of their Internet-access packages. You may receive as much as 40MB of free

storage space on the company's server, though some ISPs offer considerably less than that. But even as little as 5MB of storage could be sufficient. If you don't plan to run a large, image- or multimedia-intensive site, and you don't anticipate tons of traffic to and from your site, your ISP's limited hosting

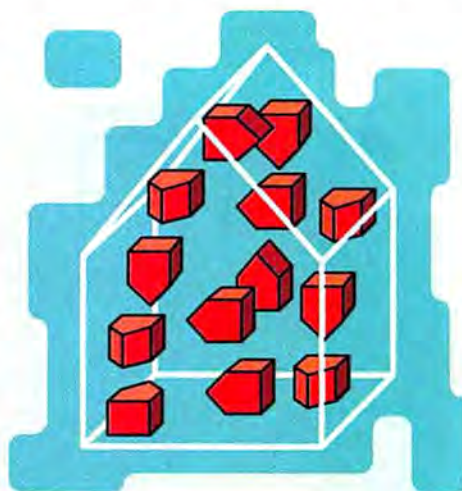
services may be just the ticket.

Find out about support: If you use Microsoft's FrontPage extensions (which are necessary for FrontPage's search, hit counter, and other Web components), you need to find a host that supports them. In addition, FrontPage may require that your site be located on the server's root directory, so

make sure your hosting service can satisfy these prerequisites.

Consider using a free host: One of the most popular free hosting services, Yahoo's

GeoCities (geocities.yahoo.com), is also one of the most reviled for its unshakable ad box. But for small sites, a free host can be great. Go to www.stormloader.com/toptwenty to find a helpful listing called the Free Web Hosting Top 20. And you should also consider checking out the Hypermart at www.hypermart.net/index.jsp for a



a new pet might want a quick way to locate potential adoptees but would also need the shelter's street address and phone number. Recent adopters might want advice on caring for their pet, so we would have to ensure that the shelter's pet-care information is easy for them to find.

Web developers often use flowcharts and storyboards to help them visualize the content of a site's pages and the links between them. You can use a flowcharting program such as the Smartdraw shareware available at PCWorld.com's Downloads library (find.pcworld.com/12220), or you can go the low-tech route: Represent each page with a 3-by-5 card and then draw lines on the cards to represent links. It may sound silly, but this technique can help you get a bird's-eye view of your site.

We made another important choice in designing our pages to use a basic version of Cascading Style Sheets, a new and powerful method for formatting Web pages. Sites created with CSS can have

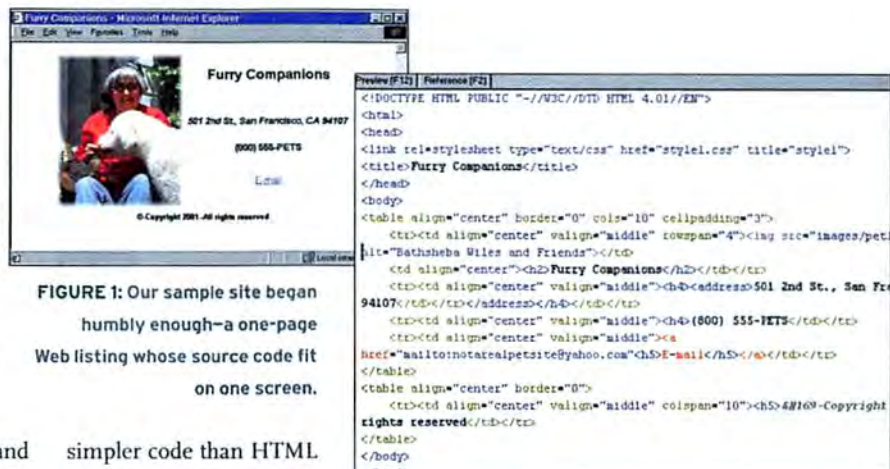


FIGURE 1: Our sample site began humbly enough—a one-page Web listing whose source code fit on one screen.

simpler code than HTML sites, but versions of Microsoft's Internet Explorer and Netscape prior to 4 don't support CSS, so we duplicated the CSS formatting in each of our site's HTML pages. Most Web editors can handle both CSS and HTML. For a discussion of the pros and cons of working with CSS, see "The Importance of Being Compliant" at find.pcworld.com/11680.

THE DOMAIN NAME GAME

GETTING A URL is a simple matter of visiting a registering-service site, entering your first choice in the site's domain-name search box, seeing if the name is

available, and plunking down your \$35 (or less) for the first year of use. Here are a few things to think about.

Keep your URL short and easy to remember. Try to choose one that tells people a little bit about the site. We chose "furrycompanions.com" for our fictional site, but we could've used "notarealpet.site.com" or "finefurryfriends.com".

Stay away from strange suffixes. Unless you're running a school (.edu), a non-profit organization (.org), or a government agency (.gov), stick with .com.

Register some variations. If you think your domain name is going to become a valuable asset or if your business is entirely Web-based, you may want to register the ".net" and ".org" versions of the name as well. This will stymie future domain-name interlopers.

Check with your Web host. Many Web hosting services include domain name registration in some of their service packages. Some offer customers subdomains of their own domain—for example, "furrycompanions.hostname.com". See "A Host of Hosts" for more on hosting services.

The granddaddy of registrars is Network Solutions (www.networksolutions.com), but these days you have many choices for registering a new domain. Check out RegSelect (www.regselect.com) for advice and pricing informa-

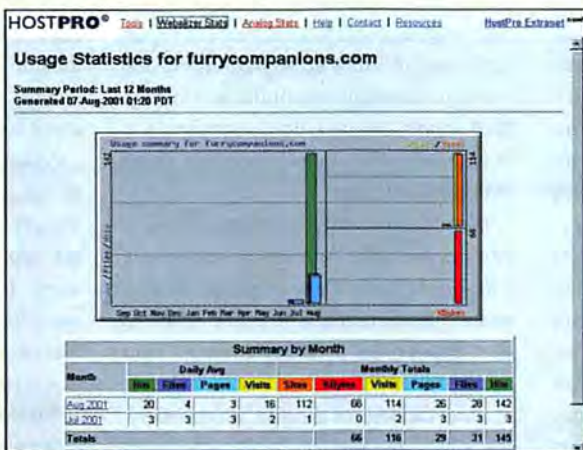
list of free hosts for businesses.

Paid hosting services from such companies as HostPro (www.hostpro.com), Yahoo's SimpleNet (www.simplenet.com), and IASA Internet Web Hosting (www.iasa-internet.net) cost as little as \$18 a month (plus a setup fee of about \$40). At that price level you can expect to get a package that includes up to 100MB of server space, a domain name, and several e-mail addresses. Most hosting services also provide basic page-setup

and traffic-tracking tools, as well as assistance registering your domain name. You'll likely have to pay the registration fee (usually around \$35) yourself.

Two reliable places to shop for a Web hosting service are the Web Host Directory (www.webhostdir.com) and TopHosts.com (www.tophosts.com).

KEEP COUNT: HostPro's site-management tools include graphical reports on usage.





JavaScript can make pages jump, move, and respond to a site visitor's input.



tion on accredited registrars. The standard charge is \$35 per year; Web-hosting service Verio, however, currently offers to register .com, .net, and .org domain names for only \$19 per year. Visit home.verio.com to check out the offer.

PLANNING YOUR UPGRADES

WHEN IT COMES time to beef up your site's features, you can find lots of free or inexpensive Web site additions on the Net. And getting them on your site often involves little more than pasting some code into one of your pages. Here's a quick look at some of the better add-ons we came across.

Looking to track how many people have visited your site? Microsoft's BCentral (www.bcentral.com) offers the free Fast-Counter, which tracks the number of visitors to your site. Go to bcentral.com/services/fc to find its registration page. BCentral also provides soup-to-nuts Web services for small businesses, including domain-name registration, e-mail, Web hosting, and Web site templates, for prices starting at \$30 per month.

A quick and easy way to engage your visitors is to poll them. Votations.com (www.votations.com) and Create a Poll (www.createapoll.com) let you create custom polls for free, the former with as many as 50 answers and the latter with a limit of 20. You can include linked images and customizable form fields in Votations.com's polls; Create a Poll gives plenty of options for formatting results.

We used a couple of JavaScript applets to add interactivity to our demonstration site. Two sites—JavaScripts.com and 24fun.com—have great selections of free, customizable scripts for download. Another site, called HostedScripts.com, offers free CGI scripts that allow you to add features such as message boards,

mailing lists, and password protection so you can limit access to your site to registered users.

Speaking of message boards, Nexus Web Development (www.nexwebsites.com) offers a free message board, among other free site components. Creating your message board is quick and simple, and you're even offered rudimentary design choices, but you'll have to abide banner ads on some of the message board pages. The board on our demonstration site is Server.com's DiscussionApp 4, which stores as many as 2000 messages and is easy to set up and customize. Server.com also offers free mailing-list, calendar, and guestbook applications.

Finally, Atomz.com's Express Search is a powerful hosted search engine that's free for sites containing fewer than 500 pages. You can customize the appearance of your search-results page, and you can generate reports on the terms that visitors to your site are searching for.

A MINI SITE MAKEOVER

THE WEB'S PIZZAZZ comes from its active elements, many of which are powered by the JavaScript language. JavaScript can make page elements jump, move, and otherwise respond to a site visitor's input. And most of them do so without having to rely on constant communication with a Web server, because they're designed to download to the visitor's browser along with the Web page.

We added two JavaScripts to our basic site's home page—an image slide show with links to pages elsewhere on the site, and a rollover menu with descriptive text that appears as a visitor mouses over menu options. We also created a simple product catalog for the site, using Microsoft's BCentral service. In all cases, introducing the new elements entailed pasting

some code into the site and making a few minor tweaks to get everything working properly. "Road Map to a Site Upgrade" on page 139 shows which sections of the JavaScript we altered to suit our needs.

Once you become familiar with adapting simple scripts to your site, the possibilities are almost endless, though the specific process will vary every time.

LET THE SLIDE SHOW BEGIN

ADAPTING CODE FROM free repositories or other sites is a time-honored Web tradition. Just be sure to give credit where it's due. We got our slide-show script from 24fun.com, but you can view it by going to furrycompanions.com and clicking View•Source in Internet Explorer or View•Page Source in Netscape. The script begins immediately after the <body> tag and extends to the second </DIV> tag.

Some of the JavaScripts you'll find house their code in an external file, which you'll need to download before adapting the script to your site. Our slide show requires the file imgtransliner.js, which you can download from find.pcworld.com/11681. Place it in the same folder as the Web page that will use the script.

Once you've opened furrycompanions.com in your browser and you've brought up the source code, select all the text from the end of the <body> tag down to and including the second </DIV> tag. Press <Ctrl>-C to copy it, and then—in your text editor (not your browser)—open the Web page that will use your customized slide show. Position the cursor at the far left of the line immediately following the page's <body> tag, and press <Ctrl>-V to paste the script into your page.

Collect the images you want to include in the slide show. You can use as many images as you like, but they must all be the same size for the dissolve effect to work. To alter the size of your images, open them in an image editing application such as Adobe's Photoshop Elements (see "Your Web Toolbox" on page 141) and use the program's resize function.

Once you've prepared the images you want to use, it's time to start tweaking ►

Road Map to a Site Upgrade

IN CREATING OUR sample site, we developed two JavaScripts: a slide show and a rollover menu. Here's a quick rundown of how to adapt each of these scripts for your site.

Adding the Slide Show

1. Pull in your images: Change all the file names that follow 'imgsrcname[x]=' to the names of your slide-show image files. Include the complete file path to your images (A).

To add more images to the slide show, copy one of the lines under 'var imgsrcname=new Array()', and paste it into an empty line under the line that begins 'imgsrcname[3]='. Change the number appearing in the brackets to 4 for the first image you add, to 5 for the next one, and so on. Replace the existing image-file name with the name of your additional slide-show image.

2. Add links to your images: Change the file names following 'imgsrcname[x]=' to the names of the Web pages that you want the images to link to (B). In-

clude the complete paths to the pages if these are stored in a different folder from the one where the page that uses the slide show appears.

3. Change the slide show's position: The slide show is currently set to run 20 pixels down and over from the upper left-hand corner of the browser window. To change the position of the slide show (C), reset the numbers after 'var imgstop=' and 'var imgsleft=' to the number of pixels from the top and left, respectively, that you wish to place it.

4. Change the speed of the transition effect: To make the transition effect run faster, reduce the number after 'var pause='.

5. Change the length of time the images stand still: If you want to change how long each image remains on the screen, simply change the number

after 'var standstill=' to the number of seconds you wish each image to be displayed.

NOTE: Be sure to add the file

item links to: Replace the file name in the quotes following 'a href=' with the name of the page you want to link to. Care-

fully include the full path to the page, and make sure that each menu item is within 'a href="x"' and '' tags.

3. Change the rollover text: Replace the text within the single quotes after 'onmouseover=' with a brief description of the page that the



'imgtransliner.js' to the folder holding the pages that the image slide show will appear on.

The Rollover Menu

1. Change the text of the menu selection: The menu items are located between the '<h3>' and '</h3>' tags in each row of the nested table. To change the text of the second item, for example, enter your text in place of 'Pick a Pet' (D).

2. Change the page that the

menu item following it links to. For example, the text that appears when someone mouses over the first menu item is 'Minibiographies of our adoptable critters'. The font face and font size are set in the last row of this nested table.

To add a new menu item, copy an entire row of the nested table and paste it onto an empty line immediately under your last menu item. Edit the new entry as described above.

A var imgsrcname=new Array()
imgsrcname[0]="images/pet1a.jpg"
imgsrcname[1]="images/pet2a.jpg"
imgsrcname[2]="images/pet3b.jpg"
imgsrcname[3]="images/pet4b.jpg"

B var imgsrcname=new Array()
imgsrcname[0]="pet1.htm"
imgsrcname[1]="pet2.htm"
imgsrcname[2]="pet3.htm"
imgsrcname[3]="pet4.htm"

C var imgstop=20
var imgsleft=20
var pause=50
var standstill=2

D <td align="center" class="menu" id="choice2" onmouseover="movein(this,'Find the right pet for you!'" onmouseout="moveout(this)">
<h3>Pick a Pet</h3></td></tr>

<td align="center" class="menu" id="choice3" onmouseover="movein(this,'For happy, healthy pets!'" onmouseout="moveout(this)"><h3>Pet

the script to make it work in your site. Start by backing up the pages you're working on. Then go back to the JavaScript you just pasted, and start changing variables. Most free scripts include instructions on which variables to change, and they're easy to find once you know what to look for. The quoted text that follows each 'imgsrcname[x]=' in our slide show script is a variable that points the browser to an image that will display. Replace these variables with the names of your image files (be sure to retain the quotation marks before and after each file name).

You'll need to make a few of these changes to get a script working; but once you get the hang of it, you'll have a powerful technique for customizing your Web site. Our "Road Map to a Site Upgrade" sidebar (page 139) walks you through the various changes we made in adapting the slide show and rollover scripts to our furrycompanions.com site.

A SIMPLE ROLLOVER MENU

SOME JAVASCRIPTS ARE set up so that you can paste all the code directly into your Web page. The menu on our site was adapted from a script written by Clarence Eldefors. We simplified the original by removing the background and rollover colors. You can download the original script at find.pcworld.com/11682, or you can adapt our version by viewing the source code of furrycompanions.com in your browser. The menu script is located in two places on this page. The first begins immediately after the </title> tag, starting with the line <style type="text/css"> and running to the first </script> tag. Copy all this text and paste it into the Web page at the far left of the line below the page's

</title> tag. This chunk of the menu's script doesn't need to be altered at all.

Now return to our sample source code, and find the second section of this script. It's in a table nested in our page's main table. Select

FIGURE 2a (right):

An example of our product pages in the MSN Marketplace.

FIGURE 2b (below):

We used Microsoft's BCentral to make a product catalog for our sample site.

| SKU | Product Name | Price | Inv. Balance | Orders Pending | End Date | Listing | Pic | Status |
|------------|----------------------|---------|--------------|----------------|-----------|---------|------|--------|
| 0875962432 | Dr. Pitman's Co... | \$17.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0525944729 | Family Dog: 16 We... | \$27.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0890877904 | Four Paws, Five D... | \$25.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 1592451532 | Holistic Guide fo... | \$16.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0314404917 | How to Be Your Do... | \$21.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0821224973 | If Only You Knew ... | \$19.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0709461307 | New Encyclopedia ... | \$40.00 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0316578394 | The Art of Raisin... | \$25.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0876052014 | The Dog Owners Ho... | \$29.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |
| 0895778394 | The Perfect Puppy... | \$19.95 | 1 | 0 | 8/10/2001 | xxxx | xxxx | active |

all the text starting with the tag that reads '<table border="0" cellpadding="3">' and ending with the first of the page's three </table> tags. Copy this block of text, and then go back to the page you're adding the menu to. Place the code where you want the table menu to appear within your page's <body> and </body> tags.

Customizing the items for your menu is a simple matter of tweaking some text and variables. See "Road Map to a Site Upgrade" for the details.

LOW-COST, LOW-FUSS E-COMMERCE

IT'S NEVER BEEN easier for a small business to place its product catalog on the Web. You can pay a developer to custom-design an online catalog and an order-processing system if you like, but many businesses find it faster, cheaper, and easier to use the e-commerce services offered by such companies as Yahoo Store ([store](http://store.yahoo.com)), Bizfinit

(www.bizfinit.com), and Microsoft BCentral. We used BCentral's Commerce Manager—which costs \$25 a month and offers you a 30-day free trial—to create an extremely simple

ten-product catalog for our pet-adoption site's Pet Resources section. Signing up for the service took only a few minutes, and we had our brief catalog of pet-related books posted on Microsoft's MSN Marketplace just a few hours after our initial registration.

The first time you log in to Commerce Manager, you enter into your catalog the products you wish to sell, either singly or many at a time, using the service's spreadsheet template. You must provide a name, a summary, an identifying number (SKU), and a price for every product. Dividing your store into departments is optional—

the service defaults to 'top level' until you designate subcategories in your catalog. You can set shipping charges by package size and weight, upload a picture of the item to include with its listing, and provide a longer description. Other optional abilities allow you to add keywords, set auction attributes (reserve price, opening bid, and minimum quantity), designate as many as 30 product variables (size, color, and so on), and add the shopping-cart HTML code to your site. FIGURE 2a illustrates how a single entry appears on the MSN Marketplace, and FIGURE 2b shows the complete list of our catalog entries.

TYING UP LOOSE ENDS

EVEN IF YOUR SITE'S visitors will number in dozers rather than millions, they'll use many different browsers running on a wide range of systems. Some of your visitors will browse at breakneck speeds over a broadband connection on a 1-GHz

or faster Pentium 4 running Windows XP; others will be stumbling along on a geriatric Windows 95 machine with a 33-kbps modem. Test your site on as many types of systems as possible, try it on every version of every browser that you can get your hands on, and use all kinds of access devices, from an office T1 connection to an old 33-kbps modem.

WHERE IS EVERYBODY?

YOU CAN BUILD the best site in the world, filled with information and services that your target audience will love, but you won't draw any visitors until you spend some time promoting your site.

The first way most people think of publicizing a Web site is by submitting it to search engines. Many site owners spend considerable time and effort making sure that their site ranks near the top when a prospective visitor enters specific search terms. But quantity isn't everything. In some cases, getting a couple dozen of the

right people to your site can be more advantageous to you than getting thousands of the wrong people there.

Think about who you're trying to attract. For some local-interest or special-purpose sites, getting ranked in a search engine might not be the best way to go. When your site serves a small, dedicated community of visitors, a Web ring, which is a site that lists links to other sites on a specific subject, or a banner-exchange program, such as Microsoft BCentral's Banner Network, might be the best bet. You submit your banner to the ring or exchange and agree to allow other banners to appear somewhere on your site on a rotating basis, just as your banner will rotate onto others. You gain free publicity, but you lose some control over your site's content because you won't know whose site banner will display when a visitor comes to

your site. Yahoo's WebRing directory at dir.webring.yahoo.com/join lists hundreds of Web rings in dozens of categories. At find.pcworld.com/11700 you'll find a list of banner exchanges.

IT AIN'T OVER TILL...

THE SITE'S UP, your traffic is increasing, the postings are piling up in the message board, and all the e-mail comments about the site are glowing. But remember, your work isn't done: It's really just beginning. There will always be more content to add, new images to place, and revolutionary Web technologies to explore. No matter how carefully you plan, something will always surprise you. But provided you maintain a strong sense of the site's goals and its target audience, Web services and free add-ons make it just as easy to run a great Web site as it is to run a good one. ■

Dennis O'Reilly is a senior associate editor at PC World.

WEB EDITORS

Your Web Toolbox

YOU DON'T NEED to have \$5000 worth of software running on a \$10,000 chunk of metal to put stuff on the Internet. Here's a quick look at tools for the Web in three categories: no-end, low-end, and midrange.

The free way: If you have Windows, you have Notepad. With a little experience, you'll find that making quick tweaks to a page in Notepad—or any other text editor—isn't particularly difficult. Two free text-editing programs that go Notepad one better are Fookes Software's NoteTab Light and Evrsoft's 1st Page 2000 2. Visit find.pcworld.com/12220 to download them.

For a few dollars more: Many people avoid HTML altogether by using "what you see is what

you get" (WYSIWYG) Web-design products. The most popular of these is Microsoft's \$169 FrontPage 2002. If you want to create a lot of pages in a hurry (and you don't mind occasionally convoluted code), WYSIWYG is the way to go. Once you get comfortable with HTML, an editor such as Macromedia's \$89 HomeSite 4.5, SoftQuad Software's HotMetal Pro 6, or CoffeeCup Software's CoffeeCup HTML Editor 8.9 makes a great addition to your toolkit.

Another step up: Macromedia's \$299 Dreamweaver 4 is a favorite everyday tool of many professional Web developers. It enables you to see a page and



its underlying HTML code simultaneously, and it includes a Flash button editor and a JavaScript debugger. Another popular tool is Adobe's GoLive 5, which costs \$284.

Image editors: We used Macromedia's \$299 Fireworks to create the contact menu for our site. Fireworks also includes tools for animating and optimizing images. Adobe's \$99 Photoshop Elements can't quite match the Web-readiness of Fireworks, but it costs a lot less. Specialized apps like Ulead's

\$45 GIF Animator can be a great help, too.

One of the newest tools in the Web designer's arsenal is Macromedia's Flash 5 (\$399), a vector-graphics program that produces animation files small enough to download quickly over a 56-kbps modem.

From here to there with FTP: Most browsers and HTML editors provide some type of FTP capability, but you may find that it's simpler and more effective to use an FTP client program such as Ipswitch's \$40 WS_FTP Pro 7. A free WS_FTP Limited Edition has nearly all the functionality of the Pro version, but it's available only for noncommercial use.



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- Windows 98/2000/ME
- Includes ScanSoft® PaperPort® Deluxe 7.0

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Don't turn your aging machine into a doorstep—pass it along to someone who really needs it. You might even get a tax write-off.

WAYNE CROFT,
of Lockheed Martin,
organizes the
donation of the
company's old PCs
to schools.

New Life^{for} Old PCs

BY JUDY HEIM

You've just replaced your four-year-old computer with a new 1.4-GHz system, but you haven't got a clue what to do with your used PC. You're not alone. Average computer users buy a new system every three to five years and, if they don't give their old system away, they generally relegate it to the storage closet or they simply dump it out with the trash.

But there are better solutions for your outdated equipment. Just ask Brandon Martin, a 16-year-old from Sun Prairie, Wisconsin, whose life has been made a little easier with the timely donation of a secondhand PC.

Martin suffers from hydrocephalus, a condition that causes fluid to accumulate in his brain. His resulting disabilities—vision problems and paralysis in one hand—made him a target for bullying in school. After classmates beat him two years ago, his mother pulled him from school to teach him at home. But she needed a computer that would fit her son's specific needs.

Enter Computers to Help People, a Wisconsin-based group that matches donated computers with people ▶

who need them. CHP's Carl DuRocher set Martin up with a used Pentium system that included a mini keyboard to accommodate his one-handed typing and software to enlarge letters on the screen.

"I'm very thankful that we were able to get a computer that works the way it does," says Martin. "It's helped me greatly. In addition to schoolwork, I can keep track of my schedule and e-mail friends."

Across the country thousands of individuals like Martin, as well as schools and charitable organizations, are in need of computers. Yet every year millions of PCs are tossed into landfills or closets instead of being put to good use.

75%

of obsolete
electronics
products end
up in storage

(SOURCE: EPA)

In 2002 an estimated 63.3 million desktop systems will be taken out of commission, according to a study by the National Safety Council. That number doesn't include the millions of notebook computers, personal digital assistants, and cellular phones that will fill up dustbins, too.

We pay a hefty price for all of this electronic waste. When buried in landfills, excessive amounts of the toxic substances that PCs contain—such as lead, mercury, and cadmium—could conceivably contaminate water supplies and cause cancer, birth defects, and damage to body organs.

But you don't have to let your aging systems gather dust or taint groundwater. You can donate them to a worthy cause or recycle them. (See "Attic Alternatives" on the next page for resources to help you with either option.) In an informal poll of 6000 readers that we conducted on PCWorld.com, about 9 percent reported donating their last outdated system to a charitable organization. (Only 3 percent recycled their PC.) The good news, however, is that 36 percent gave their system to a family member or friend, thus extending the life of their machine.

Of course no solution will keep every PC out of the trash (used systems eventually break down and electronic recycling is still inefficient and costly), but your efforts might help turn the mountain of electronic waste into a molehill. And if you give your system away, your donation could help narrow the digital divide for people who can't afford a PC.

CHARITABLE COMPUTING

CONSTELLATION ENERGY, the holding company for Baltimore Gas & Electric, has been donating old PCs to charitable organizations for two years. Some of those systems have gone to YMCAs in the Baltimore-Washington, D.C., area to be used by children in after-school programs and day-care centers. Bruce Norton, an environmental scientist with Constellation, says that donating is not only good community relations, but also cost-efficient. Storage space for unused systems can cost a company thousands of dollars a year. And electronic-waste handlers generally charge \$25 to \$50 per machine to pick up old PCs and recycle them. The nonprofit organizations that Constellation works with, however, haul off everything for free. "Not only does this save us a significant amount of money each year, it puts those old computers out in the community that we serve," Norton says.

"The need is out there," says Dr. Yvette Marrin, president and cofounder of the National Cristina

Charitable Checklist

INTERESTED IN DONATING your PC to an organization or school? Here's how to prepare your system to give it away and get a tax write-off in the process.

TEST YOUR EQUIPMENT

Make sure everything—mouse, modem, keyboard, and peripherals—work. Confirm that the monitor doesn't flicker and that the image is clear. If something doesn't work, check with the charity before sending your equipment.

LABEL COMPONENTS AND CABLES

Ship desktop systems and laptops with cables, and label all cables and components with the system's make and model to keep them together. If you're donating more than one computer, send an inventory list with the shipment.

REMOVE DATA

Overwrite, rather than delete, important files with a utility such as Norton Utilities' WipeInfo. Deleted files can be retrieved. Security pros recommend overwriting sensitive company data at least seven times.

DELETE THE OPERATING SYSTEM AND APPLICATIONS

Many charities and organizations prefer to install their own version of Windows on a donated system to avoid bizarre settings or drivers that your version may have picked up. Some organizations want your boot-disk floppy. As for applications, a typical software license forbids you to give the program to someone else, so you'll need to delete these—especially if you intend to continue using the applications on your new machine. See "Prep an Old PC for a New Home" (find.pcworld.com/12100) for more tips about cleaning your system.

GET A RECEIPT

To get a tax deduction for your donation, you must give the PC to a recipient that qualifies as a Section 501(c)(3) nonprofit organization or school and not to an individual or to a nonprofit political advocacy group. Ask the organization for a receipt that includes its name, its tax ID number, and a list of the donated components. To determine the write-off value, see the Orion Computer Blue Book (www.bluebook.com), which lists the resale value of equipment, or check out the final auction price of a comparable system sold recently on eBay (www.ebay.com). Keep all documentation regarding the PC's worth with your tax papers. If the system's value exceeds \$5000, you'll need to get an appraisal from a qualified appraiser (Orion provides appraisals through its site). Corporations donating computers to schools can receive additional deductions under the New Millennium Classrooms Act for machines that are less than three years old.

Attic Alternatives

INSTEAD OF STORING your old PC in the attic, donate it, recycle it, or trade it in through one of these organizations.

DONATIONS

National Cristina Foundation: Will put you in touch with a nonprofit in your area. www.cristina.org

Computers for Schools Association: Refurbishes PCs and passes them on to schools. www.pcsforschools.org

KidSource OnLine: Maintains a database of schools that are looking for PCs. www.kidsource.org

Gifts in Kind International: Works with corporations to place primarily new

equipment in the United States and other countries. www.giftsinkind.org

RECYCLING

National Safety Council Electronic Equipment Recyclers List: State-by-state list of recycling companies. find.pcworld.com/12102

Electronic Industries Alliance Recycling and Reuse Programs: State-by-state list of recyclers and reuse organizations. www.eiae.org

International Association of Electronics Recyclers: Database of companies that recycle electronic equipment. www.iaer.org/search

VENDOR PROGRAMS

IBM Product Take-Back Program: For \$30 IBM will recycle or refurbish whatever equipment you send it—whether from IBM or from other manufacturers. Call 888/746-7426 and ask for product number 06P7513.

Gateway Trade-In Program: Turn in your Gateway system or donate it to charity and get up to \$50 off of a new Gateway PC. www.gateway.com/recycle

Hewlett-Packard Recycling: HP asks for \$9 to \$30 per component, plus a \$4 service charge, to accept your old system—of any brand name—at an HP recycling center. www.hp.com/go/recycle

Foundation (www.cristina.org), an organization that pairs individual and corporate donors with charitable groups and agencies around the world that are seeking computers to train people who are poor or disabled. "Before they pick up the phone to call a waste management firm, [people should] look around their community. I guarantee there is a need for those computers."

Marrin, a special-education teacher, started NCF 18 years ago with Bruce McMahan, the father of one of her students. In the last few years, the foundation has placed over 25,000 secondhand computers. NCF offers its service free to donors and recipients. To donate, you fill out a form on NCF's Web site stating your PC's processor speed and memory (not every system is suitable for donation; see "Past Their Prime" on page 146). NCF will try to match you with a charity in your area. If your company is disposing of hundreds of PCs at a time, NCF will try to match you with a nonprofit organization that will pack up the systems and take them away for free.

But private nonprofit organizations aren't the only institutions in need of equipment; schools are surprisingly PC-deficient, too.

SCHOOLS IN NEED

YOU'D THINK THAT a school in Silicon Valley—ground zero of the technology revolution—would be teeming with the latest and greatest computers, right? Well, until recently, PCs were as scarce in the classrooms of Anne Darling Elementary School in

San Jose, California, as they were in the homes of the school's many low-income students. "We get very little funding for technology," says Richard Soos, a tech teacher at Darling, who notes that the only computers the school possessed were a few woefully outdated systems in its computer lab.

Soos posted a plea for computers at KidSource OnLine (www.kidsource.com), a parenting Web site, but he had only faint hope of getting a reply. Before long, however, the San Francisco office of a national bank (which wishes to remain anonymous) offered to donate 80 of its retired PCs. A number of other donations followed, and now every classroom at Darling has six multimedia PCs.

"People think...the schools are doing okay, they're buying the latest PCs, there's no need for me to donate mine. But that's only true for affluent schools," says Karen Dillon, president of KidSource.

KidSource has placed 125 used computers in the past few years, but Dillon says she could place many more if she had them. The site is often flooded with requests for equipment, such as the appeals from a school for deaf children in Encinitas, California, and from a school in Arkansas suffering from budget cuts.

Hundreds of small, local nonprofit groups around the country place used equipment in their communities, too. Lazarus Foundation (www.lazarus.org), formed by a PC user group in Columbia, Maryland, has refurbished more than 2500 systems for educational institutions and nonprofit

63.3 million
desktop
computers
in use today
will be
replaced
with new
systems in
2002

(SOURCE: National
Safety Council)

it organizations, including Head Start programs. Lazarus works with Lockheed Martin's corporate office to distribute its old PCs. Lockheed employees also volunteer to visit the schools to help get the computers networked and to instruct students about how to use them. "It's such a delight to see the enthusiasm in people, especially kids, when you deliver their computers," says Wayne Croft, a purchasing representative at Lockheed Martin.

Project ReBoot (www.gatfl.org) in Stone Mountain, Georgia, works with disabled kids and adults. The group recently provided PCs for an ALS patient to communicate with his family, and for an accountant who had suffered a stroke and needed to work from home during tax season.

You can check your own city's official Web site for charities seeking PC donations in your area. Or phone local schools and organizations directly. But

call before you drop off equipment: Many organizations, such as some Goodwill Industries outlets, have been inundated with outdated and broken PCs, and no longer want used computers.

PAST THEIR PRIME

INDEED, SOME SYSTEMS ARE simply too old to be useful for anything other than recycled parts. They may be incompatible with contemporary software, or they may be too slow to allow users to surf the Web. Every organization has different criteria for what they'll accept. Schools tend to seek, at a minimum, Pentium machines with color monitors, Windows 95 capability, and 28-kbps modems. To donate to NCF, your system must contain at least a 486 processor with at least 16MB of RAM.

Most organizations won't accept broken PCs, but others welcome nonworking systems and use them

36%

of readers gave their last old PC to a family member or to a friend

(SOURCE: PCWorld.com poll)

RECYCLING

Spinning Garbage Into Gold

THOUSANDS OF PCS and printers sit piled on wooden pallets in a Silicon Valley warehouse, while workers sift through stacks of motherboards and peripherals, and industrial-size furnaces gorge on melting plastic and precious metals.

What might appear to be an electronic graveyard is actually a transition point for old systems that are on their way to a new life. United Datatech Distributors (UDT) in San Jose, California, isn't where old PCs necessarily come to die (though some will expire here). It's where they come to be reborn and resold—either as refurbished systems or as melted-down parts.

Creating the latter is a complicated process marked by hours of manual labor and mechanical sifting—for little return.

A five-year-old PC that cost \$1500 to \$2000 brand new is worth less than a buck when it's melted down, says Tom Hogye, UDT's director of sales and business development. PCs do contain pre-

cious metals—gold, silver, and copper—but the amount in one machine is negligible. Even a ton of equipment yields only about 10 troy ounces of gold, 50 to 60 ounces of silver, and barely an ounce of platinum or palladium (a troy ounce, used for measuring gems and metals, weighs about 25 percent more than a regular ounce). The additional process of recycling the vari-

ous types of plastic and lead-laden glass in PCs is also time-consuming and costly.

That's why UDT charges about \$20 per PC to process machines (it works with businesses on volume and prefers not to receive single PCs from consumers). And it's why UDT, with permission from the discarding company, tries to refurbish or resell a system before recycling it. This is where the real value comes in.

Employees first test computers and peripherals for working parts, and set them aside for possible resale. The workers then disassemble the

outer cases of useless machines, and they remove metal parts for melting. Lead and plastic are separated for pulverizing, too. But the boards and circuitry are the real gold mine. Infrared heaters help remove integrated circuits, which can be resold to manufacturers. UDT had over \$1.2 million worth of new and salvaged integrated circuits stockpiled when we visited.

One person's electronic garbage is a recycler's gold. —Frank Thorsberg

Cadmium in semiconductors can cause lung cancer and kidney damage.

Brominated flame retardants in cables, boards, and casing can cause permanent damage to behavior and memory.

Lithium in batteries can produce heart and birth defects.

Mercury in switches can cause neurological and developmental damage in children.

PC PERILS Computers contain various toxins that, when discarded in large volume in landfills, can harm humans.



for technician training programs. The Chicago-based Computers for Schools Association (www.pcsforschools.org) accepts broken PCs, but donors must pay to ship their equipment to Chicago.

FEW RECYCLING OPTIONS

WHAT IF YOUR PC is too old to give away? The majority of discarded machines end up in county landfills. In most municipalities, such dumping is legal for individuals, but under current Environmental Protection Agency regulations, company-owned electronic waste must be recycled.

Given how toxic a computer's contents can be (see the graphic in "Spinning Garbage Into Gold" on the previous page), recycling is clearly more environmentally sound. States are awaking to concerns about PC wastelands and the potential effects of toxins—California and Massachusetts banned landfill dumping of monitors earlier this year.

But while most metropolitan areas have programs for recycling paper, plastic, glass, and motor oil, computers have been left out of the equation—mainly because few recycling plants are equipped to handle electronic products, and the methods for recycling such items are time-consuming and costly (see "Spinning Garbage Into Gold"). Furthermore, few plants accept individual cast-offs from consumers, preferring to traffic in volume jobs from PC makers and from corporations.

All of that may change soon. A year-long pilot recycling project, initiated by the Electronic Industries Alliance (www.eiae.org), is due to start in October in select states. The project will test recycling models for municipalities, retailers, and consumers (who will be required to pay a drop-off fee) to determine the best methods for future recycling plans.

In the meantime, you still have a few options to keep your PC out of the waste stream. Some computer makers and retailers already offer or plan to offer programs that accept PCs and components for recycling. Best Buy stores have launched a program at select locations that lets you turn in most old products for free recycling (you'll need to pay \$10 to \$15, however, to recycle a computer monitor or a TV). Hewlett-Packard and IBM already run recycling programs. For fees of \$9 to \$30, they'll recycle whatever you send them. Other manufacturers offer rebates on new equipment in exchange for old machines (see "Attic Alternatives" on page 145).

In the future, though, you may not have to pay a manufacturer to take back its outmoded equipment. The European Parliament recently voted to draft leg-



WISCONSIN TEENAGER Brandon Martin sits in the office of Computers to Help People, an organization that set him up with a Pentium system to suit his special physical needs.

38%

of readers
are 'very
concerned'
about the
environmental
effects of
dumping PCs

(SOURCE: PCWorld.com poll)

islation that, if passed (by early next year), would require electronics manufacturers in European Union member countries to take back and recycle the products they sell and to pay for house-to-house collection of those items. In the United States, San Francisco supervisors have passed a similar resolution for that county, and the California state legislature is being urged to pass a statewide law, too.

EVERYTHING OLD

RECYCLING IS A GOOD way to reduce the volume of electronic waste that gets dumped into landfills each year. And if your computer is beyond repair, that solution may be your best option. But until PC recycling becomes more commonplace, you can still do good with your old PC. As long as your machine works and can satisfy someone else's needs, why not try giving it away first?

Despite the number of computers sold in the United States each year, we're still far from realizing the rallying cry of "a computer in every home." But even one donation can make a difference and add years to your PC's life span. ■

Judy Heim is a contributing editor for PC World; Frank Thorsberg is a freelance writer in San Francisco.

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SPECIAL REPORT CRM SOFTWARE

150 CUSTOMER SERVICE FOR A SONG
CRM software shouldn't cost a fortune.

156 INTEL ATTEMPTS TO ECLIPSE SUN
The new Itanium CPU signals a server war.

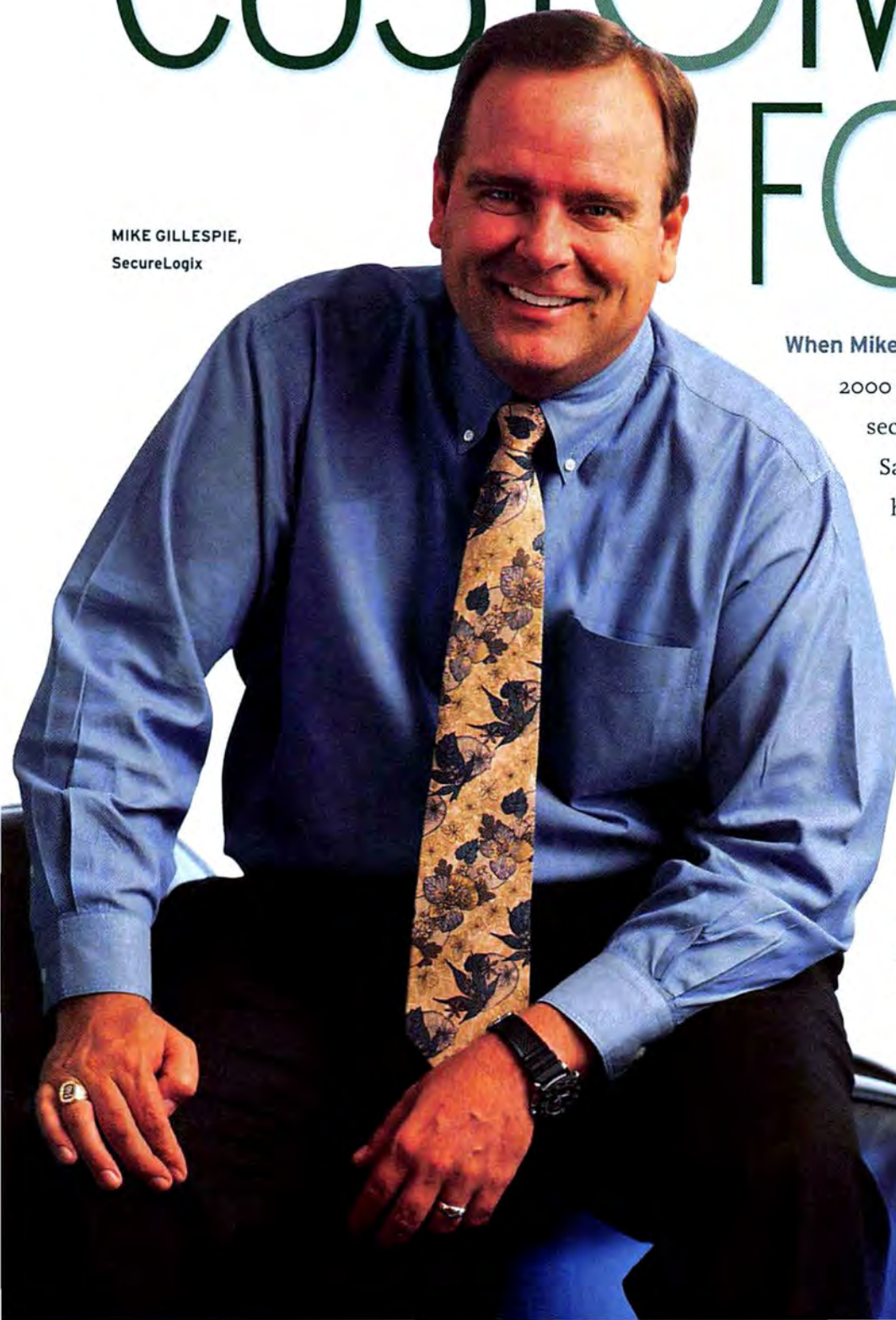
158 WHAT DO YOU KNOW?
Lotus Discovery Server boosts knowledge management.

158 TALK BACK TO YOUR E-MAIL
Manage your information while on the road—with your voice.

CUSTOMER FOR A

MIKE GILLESPIE,
SecureLogix

When Mike Gillespie arrived in January 2000 at SecureLogix, a firewall and security management firm in San Antonio, he knew that he had a big job ahead of him. In September 1999, the 90-employee company had begun deploying a powerful customer relationship management software package to help the company keep up with a growing customer base. Four months later, that effort had stalled badly. An experienced manager of CRM systems, Gillespie had been hired to help pick up the pieces.



SERVICE SONG

Customer relationship management software doesn't have to cost hundreds of thousands of dollars. **BY MICHAEL DESMOND**

"When I got here, I looked at the cost benefit of moving forward with the [existing] software [versus] scrapping it and putting in another system," Gillespie explains. "It was a lot more economical to deploy another system."

The company chose SalesLogix (no rela-

tion to SecureLogix), an affordable CRM package tailored for small and medium-size businesses. CRM software like SalesLogix allows companies to gather, analyze, and act on information about current and prospective customers. These packages unify access to this data, ensuring

that sales, marketing, customer service, and even product development teams all work from a common set of contacts, customer histories, and other information. The result: more-focused interaction, fewer embarrassing gaffes, and—hopefully—increased sales and profits. ▶

MAKE SURE YOU GET OFF ON THE RIGHT FOOT

CHOOSING AND deploying a customer relationship management package involves more than just selecting the most appealing software. Here are a few things to keep in mind as you start your CRM odyssey.

Make it easy to use: Look for a package that won't confuse users and burden administrative staff. Remember, says Jerry Norman, president of Market Answers, a CRM consultancy in Austin, Texas, "You are asking your salespeople to do things in a way they weren't doing it before."

Get executive buy-in: It seems obvious for a project that could change many of your business practices, but don't overlook the need for an executive champion. Your CIO or CTO would be a good ally, but your CEO would be better.

Take charge of the rollout: Make sure you assign someone below the VP level to oversee the day-to-day supervision of CRM operations. This person can monitor staff



compliance with the new software and help manage troubleshooting, while the executive concentrates on the big picture.

Don't delegate to IT: Your IT folks may know technology, but they don't have expertise in the processes that drive sales, marketing, and customer services. Dick Lee, principal of High Yield Marketing and a frequent speaker on CRM, is blunt: "I've been in this business since the beginning and while IT is critical, I have never seen a suc-

cessful IT-led implementation. Never."

Be quick: No company can afford a two-year CRM rollout. Regard anything that may take more than 120 days with caution. Divide long projects into blocks that can yield success independently.

Work with your employees: Ultimately, your people will help determine the success or failure of your CRM efforts. Fail to train your staff and your CRM system could end up stuffed with bad information that does more harm than good. Also consider establishing staff incentives or perhaps tying commissions to CRM use.

Form a partnership: Find a value-added reseller or consultant who is experienced in CRM and who knows the ins and outs of the packages. All software has quirks, and all business processes pose challenges. After the rollout, make sure to keep up your relationship with the consultants—you'll benefit from their insight down the road.



ALL FOR ONE, ONE FOR ALL: CRM deployments can be expensive because they touch nearly every part of a business. By driving everything from marketing campaigns to call center operations to inventory management through a single knowledge base, companies are able to fine-tune customer interactions at every point of contact.

Gillespie and his team evaluated a number of CRM packages; of these, they opted for SalesLogix because of its substantially lower cost and faster deployment time. Six months after Gillespie arrived, the company had the new CRM system fully deployed and operational.

"I didn't have time to mess around. We

were a start-up, we had guys in the field, and we needed to get it done," he says.

CRM WRIT SMALL

GILLESPIE'S EXPERIENCE is hardly unique. Customer relationship management systems have been hailed as a way for companies to find, influence, and

retain customers. Packages from companies like Onyx, Pivotal, and Siebel go far beyond simple contact and sales management—they link sales, marketing, and customer support operations into a single, cohesive chain.

But the complexity of CRM systems can turn deployments into expensive, time-consuming mistakes. SecureLogix, for example, had poured nearly \$200,000 into its aborted CRM project. Many companies need low-cost, easy-to-implement CRM software. Fortunately, affordable packages have finally matured.

"Anecdotally there's a fairly high failure rate attributed to CRM implementations," says Jocelyn Young, program manager for CRM services for IDC.

Industry experts cite failure rates for CRM rollouts of up to 70 percent. That's a disastrously high figure for initiatives that

CASE STUDY

Setting Up Siebel: When It Makes Sense to Go Big

EVERYONE LIKES to save a buck, but large deployments that go beyond the abilities of more-affordable packages are often still the best solution. That was the case at Standard Register, a Dayton, Ohio, document and information management company that sought to tie together sales and customer service across four business units, using enterprise-level Siebel software.

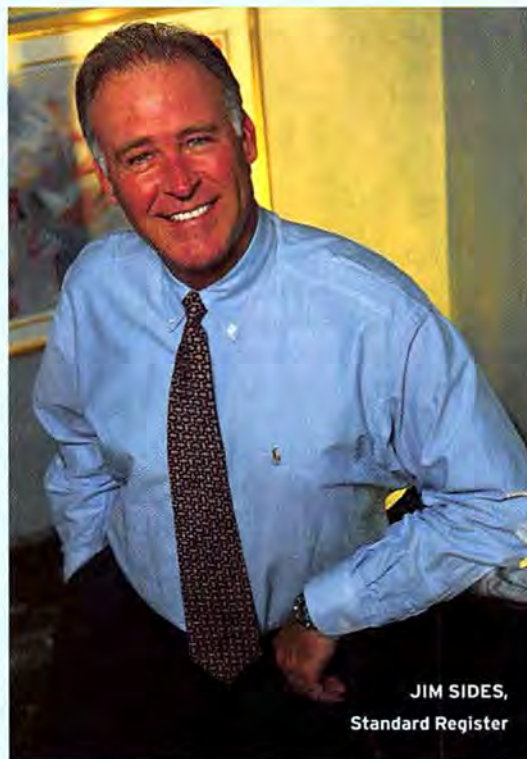
"With more than one business unit, we had more than one view of the customer, and that was a major reason we decided to implement a CRM program," says Jim Sides, director of CRM for Standard Register. "Our primary reason was to have one view of the customer and to allow the customer to have one view of us."

Sides's team assessed a number of packages for rollout to more than 2000 employees, both in-house and on the road. Among the requirements: The software had to support both networked and unconnected environments, and it had to be able to tap into the company's massive Teradata

back-end data warehouse. With so much at stake, Sides took a methodical approach to the challenge.

"All the major magazines in the industry were screaming about how 65 to 70 percent of CRM implementations were failing," Sides explains. "The way we started was to evaluate all our processes, from the original contact all the way through delivering and invoicing for the product."

Industrial-strength CRM doesn't come cheap, however—Sides found per-seat license costs ranging from \$1750 to \$2500—but the real money is spent in consultations, integration, and development. "By the time you do all those things, [license fees] represent only about



JIM SIDES,
Standard Register

25 percent of the cost of the project. I think that's one of the reasons these projects fail. People tend to look at the licensing cost per user."

typically cost hundreds of thousands—or even millions—of dollars. For smaller businesses or for departments within large companies, even successful implementation at that cost is out of the question.

Jerry Norman, president of Market Answers, a CRM consultancy in Austin, Texas, says the broad definition of CRM is part of the problem. "If you ask 100 people on the street what CRM is, you are going to get 100 answers. The executives know that they need CRM, but they don't know what they are getting."

One way to sidestep the issue, says Norman, is to narrow the focus of the CRM effort. Lower-cost CRM products such as Microsoft BCentral Customer Manager, Salesforce.com, and SalesLogix provide common CRM features like lead generation and management, deal tracking, and customer support management. These packages can be installed on a company's servers or hosted by an application service provider. But while a Siebel deployment can cost several hundred thousand dollars, a package like SalesLogix can be had for less than \$50,000 for 20 users—a relative pittance by CRM standards.

"If you've got a sales force of 20 people, there is no reason to be spending more than \$40,000 to \$60,000 on sales force implementation," says Norman.

Bob Thompson, founder and president of Front Line Solutions, a consultancy focusing on CRM issues, urges smaller firms to consider shrink-wrapped sales tools as well. "[Interact Commerce] ACT and [FrontRange] GoldMine have been around a long time," says Thompson. "The reality is that they have five times more functionality than most sales reps need anyway. And you can buy it at a store for a couple hundred bucks."

Both ACT and GoldMine fall under the

rubric of sales force automation software. These packages help sales reps maintain contact lists, manage schedules, and close leads. While not technically CRM software, SFA products help companies find, capture, and keep the most profitable customers. These products typically integrate with desktop productivity software like e-mail and office applications to streamline interactions and provide improved account tracking. The result: improved customer satisfaction and lower turnover.

SMALL NAMES, BIG COMPANIES

LOWER-COST CRM solutions don't appeal solely to small and medium-size busi-

nesses. Departments in large companies often turn to economical CRM packages as a stopgap measure while they wait for completion of enterprise-wide initiatives.

"You'd be shocked at how many [corporations] buy Siebel and then still have to buy and implement our package," says Clark Dircz, the CEO and

founder of Worldtrak, a provider of CRM products that integrate with Microsoft Outlook. "We have clients that have been told that they won't see their part of a Siebel implementation for two and a half years. What are these people going to do? Two and a half years is an eternity in most of these businesses. So a lot of these people will come to us, and we'll do a departmental or divisional solution." (For many companies, however, enterprise CRM products like Siebel are still the best choice. See "Setting Up Siebel: When It Makes Sense to Go Big" on page 152.)

One way to speed things up is to avoid deploying servers and software at all. That's the tack taken by offerings like Microsoft BCentral Customer Manager, Oracle Small Business Suite CRM, and Salesforce.com—which are all Web-based services. These browser-based ▶

"IF YOU ASK 100
PEOPLE ON THE
STREET WHAT
CRM IS, YOU ARE
GOING TO GET
100 ANSWERS."

THE PACKAGES

WEB-BASED

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Leading sales force automation software that allows companies to better target and service customers.

www.frontrange.com/goldmine

Interact Commerce ACT

Another leading sales force automation package that helps companies get the most from their sales reps.

www.act.com

Microsoft BCentral Customer Manager
Part of Microsoft's broader BCentral business-oriented Web offerings.

www.bcentral.com

Oracle Small Business Suite CRM

Formerly known as NetLedger System 1, the CRM tools sit beside other services.

www.oracle-smallbusiness.com

SalesForce.com

Top-rated online CRM package takes aim at enterprise-class CRM products.

www.salesforce.com

SHRINK-WRAPPED

Optima ExSelligence

Full CRM suite at a midmarket price.

www.optima-tech.com

Clarify

Strong in customer service operations.

www.nortelnetworks.com/products/ebusiness

SalesLogix

Best at sales force automation, particularly for the business-to-business crowd.

www.saleslogix.com

Worldtrak

Integrates directly into Exchange and Outlook, using SQL Server on the back end.

www.worldtrak.com

applications store CRM data on remote servers, making it easy for users to access the data anywhere that they can get an Internet connection.

Online customer relationship management seems to be gaining appeal. Leading technology companies Autodesk and Broadvision have both standardized their CRM on Salesforce.com.

CRM IN THE HOUSE

NOT ALL COMPANIES are ready to take their CRM business online. The prolonged outage of Microsoft's MSN Messenger service in July offered a cautionary lesson for IT managers who considered hosting business processes on remote vendor servers. For companies that prefer to keep their CRM efforts in-house, packages like Optima ExSelligence and SalesLogix can cost less than half as much as software from IBM or Siebel.

Dick Lee, principal of High Yield Marketing and author of four books about CRM, warns that no package can cover the broad range of CRM tasks. "When Siebel says 'we do it all,' forget it. Nothing

does it all. Not at a best-of-breed level. As you downscale the packages, they get more specialized."

The secret, says Lee, is to find a package that dovetails with your organization's priorities. Lee singles out SalesLogix as a good sales force automation package, and he feels that Clarify excels in customer service. The best all-around alternative, however, may be Optima ExSelligence, which Lee says offers enterprise-class functionality at a reasonable cost.

Companies looking to bulk up contact management while preserving ease of use might consider packages that integrate with Microsoft Outlook. By serving up information in the familiar Outlook interface, CRM products from companies such as Worldtrak piggyback CRM onto the popular e-mail client and interact with Microsoft Exchange Server to provide users access to CRM data.

WALK THE PATH

DECIDING BETWEEN using a Web-based CRM package and hosting an application in-house should be the last thing to worry

about, contends Lee, who speaks frequently about CRM. He says CRM adoption must start from a well-defined strategy that focuses squarely on the customer.

"The single most important thing is for the business to step back and take the time to develop customer-centric business strategies," urges Lee. "If you don't, it doesn't matter what kind of technology you put in—it's not going to work."

Market Answers' Norman agrees, but warns companies not to overanalyze. "I think it is a huge mistake for midmarket companies to analyze their sales process and get [it] down to a gnat's whisker. It's going to just stall them."

Ultimately, says Thompson, CRM is about people and customers. "Good businesses understand intuitively that good CRM is about taking care of your customers," Thompson says. "If customers don't like what you are doing, you're toast." ▶

Michael Desmond is president of Content Foundry, which provides editorial content and services to high-tech companies.

CASE STUDY

Quick-and-Dirty CRM

AS PRESIDENT and founder of Front Line Solutions, Bob Thompson has been consulting on CRM issues for three years. The Web site run by his company, CRMGuru.com (www.crmguru.com), boasts more than 70,000 members. But Thompson's start in CRM was more modest. As the sales manager of a computer reseller, he used Visual Basic and a simple Excel product database to create a customer-quote template for a 20-person sales force.

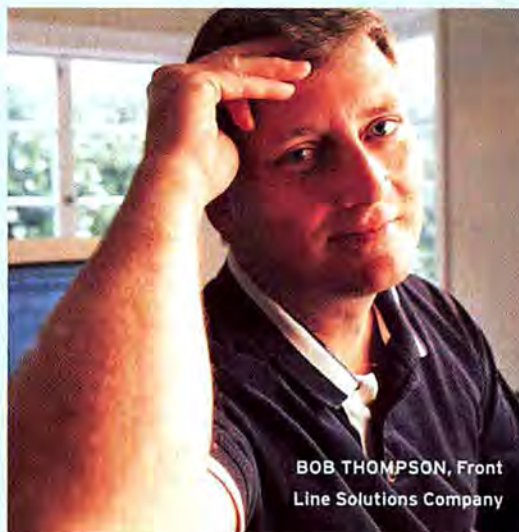
The Visual Basic application provided a user interface to a spreadsheet that contained all the company's product information, including pricing, descriptions, and ID numbers. Sales reps would type in a part number, and the template displayed all the data about the product, including profit margins based on proposed customer pricing. The app's immediate result: an end to price misquotes that sometimes had

representatives selling products below cost.

"We were having errors on 80 or 90 percent of our orders," Thompson says. "That went down to just 5 or 10 percent, and the severity of the problems changed from almost life-threatening to minor. We just stopped losing money on these deals."

Thompson says that his Excel experience offers a valuable lesson for managers tempted to apply large-scale CRM solutions to fairly simple problems. Thompson urges companies to examine existing processes and reveal areas of failure.

"It wasn't our problem to solve inbound call center response rates. It wasn't our



BOB THOMPSON, Front Line Solutions Company

problem to automate the selling process. It wasn't our problem to have a self-service application," Thompson explains. "You have to think about what are your points of pain and what are you trying to accomplish. This is the really hard work of CRM."

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INTEL ATTEMPTS TO ECLIPSE SUN

YOU COULD say that Intel has been developing a powerful Sun block for almost a decade. As Intel has dominated the PC processor market, Sun Microsystems has ruled the world of workstations and servers with its 64-bit CPUs, most recently the UltraSPARC III. But this May, when Intel shipped its long-awaited 64-bit Itanium processor, it signaled its intention to rewrite the rules of server buying.

Intel wants to lure IT managers away from their dependence on one server company by driving down costs and steadily increasing processor speed. The company used the same tactics to help sell the world on Wintel desktop PCs—and end the glory days of mainframe computing. But the Intel-Sun rivalry won't be settled quickly: Many IT groups are taking a wait-and-see approach toward the Itanium this year.

THE ITANIUM DIFFERENCE

COMPARED WITH Intel's 32-bit Pentium and Xeon chips, Itanium processors support much more memory and use an Explicitly Parallel Instruction Computing design, which handles larger amounts of data quickly and rushes it to waiting applications. With large on-board caches of 2MB or 4MB and clock speeds of 733 MHz or 800 MHz, Itanium CPUs can power formidable multiprocessor servers.

Ever since the Itanium's development began in 1994 with help from Hewlett-Packard, Intel has had plenty of time to woo hardware makers. In June, Compaq

announced it would gradually end development of 64-bit Alpha server processors and join in selling and promoting Itanium-based servers. Once that happens, Sun and IBM will be Intel's only competition in the server CPU market. (Look for IBM to launch the Power 4 in late fall with a clock speed of at least 1 GHz.) For its part, IBM has also pledged to sell Itanium-powered servers in addition to servers using its own chips. Sun has not.

SOFTWARE IN WAITING

HOWEVER, a basic issue looms large for IT managers considering the Itanium: The software that will best capitalize on the chip's power has yet to arrive. The Itanium is designed to work with several operating systems, including versions of Linux and Unix. A 64-bit version of Microsoft's Windows XP has silently slipped into the market (see *Top of the News*, August 2001, at find.pcworld.com/12360), but none of the major enterprise-software vendors, such as Oracle or SAP, has optimized its code yet. Today's 32-bit apps will run on the Itanium, but they must be recompiled for top speed.

People running applications that deal with large data sets (such as design programs or scientific applications) may see some immediate improvement. "You get the most advantage with those types of applications, or with database programs



where the increased memory addressing benefits you," says Steve Josselyn, IDC research director.

The Itanium's memory prowess helped persuade Los Angeles-based Popcast to choose the architecture, says Josh Taurek, Popcast's chief technical officer. The firm licenses turnkey video services solutions (such as Webcasting and video e-mail) to service providers. Popcast will begin pilot testing of its services on Compaq Itanium servers in the fourth quarter.

The firm hopes the Itanium will let it support more users with fewer servers, says Taurek. The Itanium's 4MB cache will also be important because with it Popcast applications will be able to work with large amounts of customer data (from passwords to video clips on file) without constantly accessing a database.

WHAT'S NEXT

THIS YEAR, Sun's 900-MHz UltraSPARC III will likely retain a performance edge over the Itanium. But that won't be the biggest factor in Sun's favor, says Micro-Design Resources senior analyst Kevin Krewell. "Sun's key strength is its solid OS, Solaris, and the backward compatibility with earlier versions of the UltraSPARC architecture."

Intel's second-generation Itanium, code-named McKinley, will be a more formidable competitor for Sun's chips, says Krewell. The McKinley will have a clock speed of at least 1 GHz, a faster frontside bus than the first Itanium, and a good chunk of recompiled software at its disposal, Krewell predicts. When McKinley systems ship in mid-2002, everyone will see the real strength of Intel's Sun block.

—Laurianne McLaughlin ►

TALE OF THE TAPE

INTEL ITANIUM

- ◆ Intel's first 64-bit processor.
- ◆ Gives server buyers more choice.
- ◆ Microsoft Windows XP OS and enterprise apps are yet to be recompiled for it.
- ◆ Should drive hardware prices down.

SUN ULTRASPARC III

- ◆ No newcomer to 64-bit computing.
- ◆ Used in proprietary Sun machines.
- ◆ Solaris OS and enterprise apps already fine-tuned for it.
- ◆ Faces competition from Intel and IBM.



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WHAT DO YOU KNOW?

NOT ONE TO give up on knowledge management software, which has struggled for years with a reputation for ineffectiveness, Lotus is pushing a new application platform that helps enterprises organize, search for, and retrieve everything from important documents to the names of people with specific areas of expertise. Could your company benefit? Yes. Will your company benefit? That depends.

Lotus Discovery Server (www.lotus.com/discovery) is an impressive product that spiders databases to learn where a company's valuable information is located. But like knowledge management products of years past, Discovery Server is only as good as the data it has access to.

Not surprisingly, companies that currently use Lotus Notes and Domino will have the easiest time incorporating Discovery Server and its companion product, Lotus K-station. K-station is a Web-based

portal that allows workers to set up areas in which to collaborate. Discovery Server can search those areas to organize content and learn about people's expertise.

Discovery Server's ability to spider e-mail messages and attachments is a plus because employees often share information via e-mail rather than publishing it in a central database. And the software can access any LDAP directory, including Microsoft Active Directory, to obtain employee information.

But if your company uses Microsoft Exchange Server for collaboration and messaging, Discovery Server won't do you any good—the current version does not include a spider for Exchange Server. Lotus says it will release a spider SDK later this year so that Discovery Server users can create their own spiders.



WITH LOTUS DISCOVERY SERVER, you can search for information or people who know about a subject.

Deploying Discovery Server is no small task. Faced with so many moving parts, including the spidering and indexing functions, you will want to run Discovery Server in a distributed environment of at least two servers—but probably more—in order to maintain good performance. Pricing for Discovery Server starts at \$395 per user. K-station starts at \$120 per user.

—Brad Grimes

TALK BACK TO YOUR E-MAIL

ANYWHERE, ANYTIME. It's the mantra of mobile communications. But too often, anywhere, anytime access to information means buying a new mobile device—with a new modem, and a new wireless service. Etrieve hopes you'll be happier managing your e-mail, contacts, and appointments using the same phones—wireless or wired—that you use today.

The Etrieve Mobile Office Solution gives you easy access to your important information by syncing your Microsoft Exchange data with an Etrieve gateway. After you call a toll-free Etrieve number and enter a password and a mailbox number, you can manage messages, contact lists, and calendars. Information on Etrieve's servers is always encrypted.

A text-to-speech engine will read your e-mail aloud, after which you can respond to the message by simply speaking. The reply is captured as a .wav file and then sent as an attachment.



Using a WAP-enabled wireless phone, you can read your e-mail on screen and then reply with your voice. In addition, you can use voice commands to send a copy of an attachment to a fax machine, schedule meetings with colleagues, and search your contact database. And if you're near a PC, you can manage all your information from any Web browser by logging on to the Etrieve site.

How well does it work? Fairly well. When the company showed us an early

beta version, the Etrieve voice recognition engine sometimes misunderstood or missed commands, but the company says it is constantly honing the software. Even in its beta form, the Etrieve service was easy to use and worked as advertised.

Currently, the service works only with Microsoft Exchange Server, although a version that will sync with Lotus Notes is in the works. The company underscores its security measures, but IT managers will probably still be wary of a service that replicates corporate information on servers outside the firewall. In a future release, administrators will be able to control what e-mail is replicated with Etrieve and what remains inside the firewall.

The Etrieve service is reasonably priced at between \$25 and \$50 per month per user. Just beware of those wireless phone bills—managing e-mail over the phone will eat away at your monthly minutes.

—Brad Grimes ■

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KINGSTON TECHNOLOGY COMPANY:

WHERE THE WORLD SHOPS FOR MEMORY

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Have you taken a look at your home PC lately? Your kids are abandoning it because it can't support their favorite games. And if you're using a broadband Internet connection, you may have noticed by now that your old 56K modem wasn't the only thing slowing you down. Indeed, yesterday's screamer is today's dinosaur: new PCs blaze at Gigahertz speeds, and even notebooks are reaching the 1-GHz performance mark.



Dinosaurs can still become multimedia and gaming dynamos, when you buy the same memory upgrades used by professional designers, video editors, and other high-performance users. "Adding memory is the fastest, smartest, and least expensive way to boost your system's performance," says Jason Jacobi, a spokesman at Kingston Technology Company Inc., the world's largest independent memory manufacturer. "Press reports have already shown the risks of overclocking [pushing CPUs past their approved limits] and the high costs of swapping in a new processor. Memory upgrades for PCs, notebooks, and other devices have proven to be reliable and the most effective route."

Professional PC users have counted for years on Kingston's memory products to keep their systems up to date. (Top-tier system manufacturers build Kingston memory into their new systems.) Each month, Kingston builds and tests more than two million customized modules for desktops, notebooks, printers, handheld devices, graphic cards, and digital cameras.

Business or Pleasure

Now consumers can get that same memory, factory-direct, through Kingston's new Web site, www.Shop.Kingston.com. The site helps all users find memory that is perfectly compatible with their systems. "You don't have to know the difference between EDO and PC100 modules to find the



right memory on our site," Jacobi says. Shop.Kingston's product search tool, The Kingston Memory Configurator, eliminates any worries about compatibility by allowing shoppers to sort memory by system model, memory specification, or Kingston part number. And users of PDAs, digital cameras, and MP3 players can search for memory according to the types of devices they're using.

Shop.Kingston also makes upgrades easier by providing shortcuts for most PCs and handheld devices. And if users still have questions about their memory requirements, they can always call Shop.Kingston, toll-free and 24/7, at 800-435-0057.

Shop.Kingston's customers don't have to wait long for their upgrades. All orders ship same-day, and overnight delivery is available. The site also provides easy-to-follow upgrade guides, and free, around-the-clock telephone technical support for each module.

Shop.Kingston can also offer competitive pricing to its customers. The site regularly features value pricing on high-performance modules, and rebates for new products. By selling Kingston memory directly to consumers, the site can deliver memory of unparalleled quality at a low price. Individual users receive the same lifetime warranties as Kingston's business customers, and each module undergoes the same rigorous testing at the manufacturer's facilities.

Spokesman Jacobi says Shop.Kingston will help make Web surfing, gaming, and multimedia exciting on more kinds of systems than ever before. "With Shop.Kingston.com," he says, "consumers now have the same opportunity as our business customers to get the best memory on the market, at a great price, for their high-performance needs."



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PC AMERICA: INVENTORY MANAGEMENT AT POINT OF SALE

www.pcamerica.com

While many motorists in Dimondale, Mich. say the family-owned Windmill Truck Stop is a home away from home, its controller, Kevin Edelmann, says it's been more like a house of accounting horrors. Besides monitoring retail fuel sales in the truck stop's "truckers only" area, he also has to keep an eye on commuters' and travelers' purchases in the king-sized complex's convenience store, family restaurant, motel, and auto service center. "Keeping track of all of that inventory has been a nightmare," Edelmann says.

The Point of Sale (POS) system that the Windmill had been using since 1982 did a fine job of ringing up sales, but it couldn't tell store managers anything about what was on the shelf. "The system only broke sales down by department," Edelmann says. "So it couldn't tell the difference between a tube of toothpaste and a bottle of shampoo."

Edelmann found only a few POS solutions that were easy to use, Microsoft Windows-based, and able to support multiple input devices. And none of them could manage the 20,000-plus items in the Windmill's convenience store and restaurant. "We desperately needed a solution that could bring all of these components of our business together," he says.



PC AMERICA

Things finally turned around at the Windmill once Edelmann deployed PC America's Cash Register Express (CRE 2000), a Windows-based POS program that works with ordinary PCs and peripherals, as well as barcode scanners, receipt printers, and pole displays (which show charges at the checkout counter). Now all of the Windmill's cashiers can use touch screens and barcode scanners to enter orders and update inventory. And setting up CRE 2000 could not be easier, says Edelmann. "PC America did an excellent job pulling all of the hardware together



The home page for PC America speeds you to the point-of-sale products you need.

initially. But the great thing about their software is that I can grab any component I want off the shelf and throw it together in no time. This is one slick program."

The Windmill has processed more than half a million transactions with CRE 2000 and PC America's Restaurant Pro Express (RPE 2000) since October 1999. And Edelmann predicts that PC America will continue to develop the software he needs to keep things running smoothly. "PC America is constantly improving upon their products," he says.

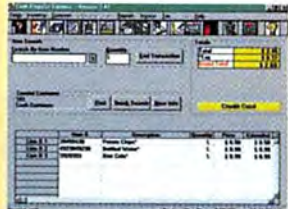
Now PC America is helping retailers like the Windmill to move beyond the sale itself to increase revenues. A new feature in CRE 2000 gives businesses the ability to print coupons on the bottom of sales receipts on an Epson TM-T88II receipt printer. They can use the coupons to advertise specials on slow business days (e.g., "10 Percent Off All Purchases Every Tuesday"), or to give their customers discounts on overstock items (e.g., "Get a Free Six-Pack of Pepsi on Your Next Visit").

CRE 2000's couponing feature promises retailers an excellent route to a crucial dimension in retail sales. "Repeat business is the most important aspect of any business," says PC America's president, Howard Gosman. "With this addition to our POS package, we are giving our customers a quick and easy-to-use method for creating it."



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Computerize any type of retail store using Cash Register Express for Windows. Computerization pays for itself, saving you thousands of dollars, giving you peace of mind, and making the best use of your time. Cash Register Express



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All PC America Software requires Microsoft Windows. The software was written in Visual Basic using Microsoft Access Files. The source code is available.

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Have your favorite business applications been bringing your desktop PC to its knees? Is your notebook buckling beneath the burden of DVD movies and other multimedia tools? PC enthusiasts often go to great lengths to bring their systems up to speed, from overclocking their CPUs to building new systems to their own specifications. But did you know that adding RAM is often the quickest, cheapest and most reliable way to boost your system's performance?



RAM upgrades can dramatically improve system performance, according to studies by nonprofit groups such as the Council on Computing Power. One study found that additional RAM could accelerate PCs running Windows 98 by as much as 42%. And many experts say systems running Microsoft Windows 2000 and Windows XP can take even better advantage of memory upgrades.

That's one of the reasons Crucial.com, a Web-based DRAM seller, is making upgrades easier for users that want to get the most out of their new (and existing) systems. "Buying the right memory for your system's motherboard should be a non-event," says Mike Sanor, technical support manager at Crucial. "That's why we're giving shoppers the tools they need to make clear decisions and to avoid compatibility problems."

Crucial has designed an online Memory Calculator to simplify memory upgrades, by helping users find just the right amount of RAM to maximize their systems' performance. "The Memory Calculator helps users find that sweet spot," says Sanor, "with performance benchmarks for motherboards with a variety of processors, operating systems and different amounts of memory."



Crucial assesses motherboard performance with Business Winstone and Content Creation Winstone from Ziff Davis. The tests measure the time a system takes to run applications through a series of scripted activities. Both Winstone tests focus on "hot spots," periods of processor- or disk-intensive activity, when user wait time is often the longest. Information from motherboard manufacturers and Crucial's own internal compatibility testing assures the accuracy of the Memory Calculator's data. The vendor continually adds new test results, and users can ask Crucial to add their favorite motherboards to the list.

"Buying the right memory for your system's motherboard should be a non-event."

—Mike Sanor, technical support manager, Crucial

As a division of DRAM maker Micron, Crucial can offer memory upgrades directly to consumers, at factory-direct prices. Micron, the largest memory manufacturer in the United States, tests all of its memory modules under extreme temperatures, voltages, and operating conditions. It also guarantees its modules to be compatible with systems matched through its Memory Selector tool.

Sanor says the Memory Calculator serves as a source of unbiased information about motherboards and memory, and demonstrates the difference additional RAM can make in most systems. "We've always made the assertion that adding RAM is the quickest, cheapest, easiest and often the most effective way to boost performance," he says, "Now we have the data to back it up."



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Top 15 Home PCs

For \$3599, Alienware's Aurora DDR has the speed, sound, and graphics for high-end games.



187

Top 10 Digital Cameras

Epson's 3.34-megapixel PhotoPC 3100Z is a new Best Buy, producing rich color and detailed photos. It weighs just over a pound and offers long battery life.

The Top of the Heap

Three of our charts boast brand-new Best Buys this month. Six 21-inch monitors debut on our *Top 10 Monitors* chart, including a new Best Buy, the Iiyama Vision Master Pro 511. On our over-\$500 *Top 10 Digital Cameras* chart, the \$779 Epson PhotoPC 3100Z hits the number two spot. Finally, the MicronPC Millennia Max XP2 tops the power section of our *Top 15 Home PCs* chart with outstanding performance and a competitive \$2397 price. See "Your Guide to the Top 100" (find.pcworld.com/11080) for details on how we compile all our charts, and be sure to check out our roundup of the top CD-RW drives on page 110.

Freelance writers Richard Jantz, Dan Littman, Joel Strauch, and Carla Thornton, and PC World editors Richard Baguley, Seán Captain, Rebecca Freed, Alexandra Krasne, Heather Morra, Kalai Murugesan, Kalpana Narayanamurthi, Melissa J. Perenson, and Alan Stafford contributed to this month's Top 100 section. Ulrike Diehlmann, Robert James, Elliott Kirschling, Jeff Kuta, Danny W. Lam, Tony K. Leung, and Thomas Luong of the PC World Test Center performed testing, with support from Julio Gianobile and Julian Weatherby.

Top 10 21-Inch Monitors

Detailed, well-contrasted images, realistic colors, and a reasonable \$749 price helped Iiyama's new Vision Master Pro 511 grab a Best Buy. It's also easy to use, thanks to user-friendly control buttons and excellent documentation.

**Top 10 Printers**

Brother's new \$299 monochrome laser, the HL-1440, fits well in the home office.

**Top 15 Notebook PCs**

With a 14.1-inch screen and lots of features, including a spare USB port and an LED that lights up the keyboard in the dark, the IBM ThinkPad T22 is a top-of-the-line laptop.

**GUIDE TO STAR RATINGS****What are the Star Ratings in the Top 100 charts?**

Last month, *PC World* launched a new five-point Star Rating system, which assesses a product's overall quality and performance.

Every time we review a new product, it will be assigned a star rating. These star ratings reflect our opinion of a product at the time we reviewed it. The rating

won't change or be updated unless bug fixes or major updates compel us to take another look at the product, or unless we do a more extensive follow-up review. In subsequent issues, a date will accompany these ratings indicating how long ago a product received its rating. Products that we tested before the September 2001 issue will not have star ratings.

In addition, the overall number rating and the Best Buy distinction will continue to appear in our charts. Both the overall rating and the chart rankings take price into account and will continue to work in the same way as they have in the past.

See "A Guide to *PC World's* Star Ratings" (find pcworld.com/10860) for more information.

TOP 10 POWER PCs

| | POWER SYSTEM | Issue tested | Overall rating | Street price (7/13/01) | PC WorldBench 2000 performance score ¹ | Faster | Comments |
|---------------------------|--|--------------|----------------|--------------------------|---|-----------------|---|
| 1 | Best BUY Dell OptiPlex GX400 find.pcworld.com/10360 | July 01 | 84 | Average: \$2245 | Windows 2000 | Good 203 | Efficiently designed corporate system ships with excellent display and combination DVD/CD-RW drive. |
| 2 | Best BUY Xi Computer 1400 MTower SP find.pcworld.com/10126 | Sept 01 | 83 | Expensive: \$2949 | Windows 2000 | Outstanding 242 | Fast system has a sharp display, two 41GB drives linked with an IDE RAID card, and a high price to match. (★★★★☆ Sept 01) |
| 3 | Sys Performance 1400TD find.pcworld.com/11341 | NEW | 83 | Average: \$2093 | Windows 2000 | Outstanding 245 | Swift performer is paired with a rich, attractive display, but it's light on software. ★★★☆☆ |
| 4 | Micro Express MicroFlex 1333A find.pcworld.com/10363 | July 01 | 83 | Inexpensive: \$1599 | Windows 2000 | Very good 231 | Excellent cost/performance ratio. Easy assembly, thanks to color-coded rear ports and a setup poster. Has an older graphics card. |
| 5 | Polywell Poly 880K7-1400 find.pcworld.com/10181 | NEW | 82 | Expensive: \$2699 | Windows 2000 | Outstanding 244 | Includes an IEEE 1394 (FireWire) card, a GeForce3 graphics board, and the fastest Athlon processor. ★★★☆☆ |
| 6 | Sys Performance 1333TD find.pcworld.com/10123 | Sept 01 | 82 | Average: \$2124 | Windows 2000 | Very good 237 | Impressive performance; graphics card supports two monitors at once; lots of room for expansion. (★★★★☆ Sept 01) |
| 7 | NuTrend Athlon Ultra 2 find.pcworld.com/11342 | NEW | 82 | Average: \$1699 | Windows 2000 | Very good 233 | Performance matches that of other speedy Athlon-based systems; includes an IEEE 1394 card with three ports. ★★★☆☆ |
| 8 | MicronPC Millennia Max XP2 find.pcworld.com/10361 | June 01 | 81 | Average: \$2014 | Windows 2000 | Good 210 | Attractive display, ample documentation, and still-quick 1.2-GHz Athlon performance; price is \$400 lower this month. |
| 9 | NuTrend Athlon Mega 2 find.pcworld.com/10366 | Aug 01 | 81 | Very inexpensive: \$1069 | Windows Me | Outstanding 178 | Speedy Windows Me system; ships with an IEEE 1394 card and has three high-speed ports for a range of peripherals. |
| 10 | Xi Computer 4170 MTower SP find.pcworld.com/10125 | Sept 01 | 81 | Expensive: \$2799 | Windows 2000 | Very good 227 | Not as fast as its Athlon counterpart, but includes similar components in a large, server-size case. (★★★★☆ Sept 01) |
| Percent of overall rating | | | | 10 percent | 25 percent | | |

See find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ A system's performance word score is relative to the scores earned by other PCs running the same operating system. See "Your Guide to the Top 100" (find.pcworld.com/11080) for more details.

IT'S ALL ABOUT ATHLONS this month, as three new PCs with AMD's powerful 1.4-GHz CPU make the chart. Sys's Performance 1400TD captures third, Polywell's Poly 880K7-1400 hits fifth, and NuTrend's Athlon Ultra 2, bearing an IEEE 1394 (FireWire) card, lands in seventh. Gateway contenders drop this month; the company is upgrading processors.

1 Dell OptiPlex GX400

Best BUY **What's Hot:** The 19-inch Dell P991 monitor accompanying the OptiPlex GX400 delivered deep, rich colors and sharp 12-point text with only slight blurring at the maximum resolution of 1600 by 1200. The midsize tower case offers chassis-intrusion detection, a double-loop case lock, and four rear-mounted USB ports. Dell's OpenManage software permits remote upgrades, diagnoses, and maintenance. Expansion options include five open slots and four open drive bays. **What's Not:** Only a basic information guide ships with this OptiPlex, though

the Resource CD-ROM contains detailed documentation. The system's reliance on RDRAM makes memory upgrades pricey. **What Else:** Armed with a P4-1400 CPU and 256MB of RDRAM, the GX400 posted a PC WorldBench 2000 score of 203—about what we would expect for a system of its configuration. The combination 8X/4X/32X CD-RW and 8X DVD-ROM drive saves a storage bay but does not match the performance of the best individual CD-RW and DVD units. **Upshot:** Speed, a beautiful monitor, and high-end management features make the OptiPlex GX400 a great buy.

2 Xi Computer 1400 MTower SP

Best BUY **What's Hot:** Xi's 1400 MTower SP has an Athlon-1400 CPU, 256MB of 266-MHz DDR SDRAM, and 82GB of storage space available on two hard drives connected to an IDE RAID card. The 1400 MTower SP's PC WorldBench 2000 score of 242 is among the highest we've recorded for a Windows 2000 system. Xi supplies a Leadtek WinFast GeForce3 board for high-end graphics. The 19-inch ViewSonic PF790 monitor displayed vibrant colors and crisp text in our test images. **What's Not:** At almost \$3000, it's the most expensive system on the chart. **What Else:** Three open PCI slots and six open drive bays (four readily accessible external bays and two internal bays) account for the expansion room. The 12X/8X/32X CD-RW drive backs up data quickly. The system comes with the Small Business Edition of Microsoft Office XP (this version, sold only with new systems,

Visit find.pcworld.com/11960 for reviews of all products ranked in this chart or tested this month.

| BASE CONFIGURATION | | | | | | | Extra features | Design/ documentation | Vendor's reliability/ service |
|--------------------|------------------|--------------------|-----------------------------------|---------------------------------|---------------------------|--------------------|---|--------------------------|-------------------------------------|
| CPU | RAM (MB/type) | Hard drive (GB) | Monitor size (diagonal inches) | Graphics board | Case type ² | Open bays/slots | | | |
| Pentium 4-1400 | 256/ RDRAM | 40 | 19 | Dell GeForce2 GTS | Midsized tower | 4/5 | Very good: combination 8X DVD-ROM and 8X/4X/32X CD-RW drive, network adapter, Wake-on-LAN, Dell LegacySelect | Good/ Average | Outstanding/ Good |
| Athlon-1400 | 256/ SDRAM | 82 ³ | 19 | Leadtek WinFast GeForce3 | Tower | 6/3 | Very good: 12X/8X/32X CD-RW drive, network adapter, Microsoft Office XP Small Business Edition | Good/ Good | *Fair ⁴ |
| Athlon-1400 | 256/ SDRAM | 61.5 | 19 | ATI Radeon | Midsized tower | 4/4 | Good: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, network adapter | Good/ Poor | *Fair ⁴ |
| Athlon-1333 | 256/ SDRAM | 40 | 15 (LCD) | CardExpert GeForce2 Ultra | Midsized tower | 3/3 | Outstanding: 12X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem, network adapter | Good/ Good | *Fair ⁴ |
| Athlon-1400 | 256/ SDRAM | 80 ³ | 19 | Leadtek WinFast GeForce3 | Midsized tower | 5/1 | Outstanding: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, V.90 modem, network adapter, Lotus SmartSuite 9.5 | Good/ Good | *Fair ⁴ |
| Athlon-1333 | 256/ SDRAM | 61.5 | 19 | Matrox Millennium G450 | Midsized tower | 4/4 | Good: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, network adapter | Good/ Poor | *Fair ⁴ |
| Athlon-1400 | 256/ SDRAM | 80 | 19 | Leadtek WinFast GeForce3 | Midsized tower | 3/1 | Outstanding: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, V.90 modem, network adapter, Corel WordPerfect Office 2002 | Good/ Good | *Fair ⁴ |
| Athlon-1200 | 128/ SDRAM | 40 | 19 | Creative Labs GeForce2 Ultra | Midsized tower | 3/3 | Good: 8X/4X/32X CD-RW drive, V.90 modem, Microsoft Office 2000 SBE | Good/ Average | Good/ Good |
| Athlon-1333 | 128/ SDRAM | 40 | 19 | Leadtek WinFast GeForce2 MX | Midsized tower | 4/1 | Very good: 16X DVD-ROM drive, V.90 modem, network adapter, Corel WordPerfect Office 2000 | Good/ Outstanding | *Fair ⁴ |
| Pentium 4-1700 | 256/ RDRAM | 82 ³ | 19 | Leadtek WinFast GeForce3 | Tower | 6/3 | Good: 12X/8X/32X CD-RW drive, network adapter, Microsoft Office XP SBE | Very good/ Good | *Fair ⁴ |
| 10 percent | | | | | | | 10 percent | 15 percent | 30 percent |

² We define vertical cases as towers (taller than 20 inches), midsized towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches).

³ Total space on two hard drives.

⁴ Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs.

includes Microsoft Publisher 2002). Xi's lockable swing-out drive door has one flaw: The door's flimsy plastic hinges render the lock pointless.

Upshot: This Athlon-powered Xi system delivers more punch than the company's very similar, P4-based 4170 MTower SP. Users who edit video will appreciate the performance boost that the two RAID-connected hard drives bestow.

NEW ON THE CHART

3 Sys Performance 1400TD

NEW What's Hot: This speed demon blazed to a 245 score on our PC WorldBench 2000 tests. That speed is due in no small part to its 1.4-GHz Athlon processor and 256MB of 266-MHz DDR memory. The system has a generous 61GB hard drive and a 16X/10X/40X CD-RW drive. The 19-inch ViewSonic PF790 display adds to the allure, delivering deep,

rich colors and sharp text that blurred only slightly at 1600 by 1200 resolution.

What's Not: Sys provides only individual manuals for components. Sys earned a tech support rating of Fair in our latest round of calls because its reps answered some questions incorrectly.

What Else: To open the midsized tower, you loosen two thumbscrews and slide the side panel on and off along its well-designed guide rails. The large, tidy interior includes four open drive bays (two internal and two externally accessible) and four open PCI slots. A sturdy single-loop case lock on the back of the case helps keep the components secure.

Upshot: This swift Sys contains impressive components and would make an excellent system for a small office.

5 Polywell Poly 880K7-1400

NEW What's Hot: The Poly 880K7-1400 we tested, running Windows 2000, zipped



SYS'S PERFORMANCE 1400TD posted a blazing PC WorldBench 2000 score of 245.

to an outstanding score of 244 on our PC WorldBench 2000 tests. The system includes a 1.4-GHz Athlon CPU, 256MB of 266-MHz DDR SDRAM, 80GB of combined storage space on two hard drives joined by an IDE RAID card, and a Leadtek WinFast GeForce3 graphics board. It also comes with a two-port IEEE 1394 card and video-editing software. ▶

What's Not: The Poly 880K7-1400's \$2699 price tag may discourage some buyers. Polywell's phone support earned only a Fair rating in our recent anonymous calls to tech support: Though somewhat helpful, its representatives didn't fare well with specific troubleshooting.

What Else: The ViewSonic GS790 has been on our *Top 10 19-Inch Monitors* chart since August 2000; it delivers deep, rich colors with crisp text that only begins to blur at the maximum resolution of 1600 by 1200. The interior of the silver midsize tower appears cramped—only one PCI slot is open, though five drive bays (four externally accessible and one internal) are free. You can add expansion cards without tools by removing the slot's thumbscrew. Fast 16X/10X/40X CD-RW and 16X DVD-ROM drives are included.

Upshot: With 80GB of storage, an IEEE 1394 card, and the fastest Athlon processor, this Polywell PC should please serious video editors.

7 NuTrend Athlon Ultra 2

NEW What's Hot: The latest model in NuTrend's high-performance Ultra 2 line, this PC is built around an Athlon-1400 processor and 256MB of 266-MHz DDR memory. Running Windows 2000, it earned a score of 233 on our PC World-

Bench 2000 tests—about average for similarly configured PCs and noticeably faster than most systems. Users of digital cameras or camcorders will appreciate the handy IEEE 1394 add-in card and its three IEEE 1394 ports. The 19-inch ADI MicroScan G66 monitor displayed our test images in bright, rich colors.

What's Not: We rated NuTrend's tech support only Fair in our recent anonymous calls.

Its representatives sometimes answered our questions vaguely. Accessing the interior of the case entails removing two screws with a screwdriver.

What Else: The Athlon Ultra 2 has a Leadtek WinFast GeForce3 graphics board for fast, smooth video. The 16X/10X/40X CD-RW drive offers speedy backups and quick burns of audio CDs. Inside the standard beige NuTrend midsize tower case, cables are neatly taped to the side of the interior, providing clear pathways for upgrades. Only one PCI slot is unoccupied, but one internal drive bay and two externally accessible drive bays are open.

Upshot: This edition of NuTrend's Athlon Ultra 2 offers enough performance and ports for any small-office user.



DELL'S OPTIPLEX GX400 retains first place with a well-designed case and a combination DVD and CD-RW drive.

ALSO OF NOTE

NEW SYSTEMS WITH 1.4-GHz Athlon processors include the Acer Veriton 9100 and the Micro Express MicroFlex 1400A. The Veriton 9100, equipped with 128MB of PC800 RDRAM, misses the chart with a mediocre score of 186 on our PC WorldBench 2000 tests. Micro Express's MicroFlex 1400A earned an above-average score of 230 on our PC WorldBench 2000 tests but lacks some features.

Systemax's Venture U17, a 1.7-GHz Pentium 4 system running Windows Me, and Venture U14, a 1.4-GHz Pentium 4 system running Windows 2000, both missed the chart because of their average speed and components. ▶

TECH TREND

Outfitting a Video-Editing Machine

VIDEO EDITORS demand more of their PCs than typical business users do. A few systems on this month's chart can accommodate video editing, including the NuTrend Athlon Ultra 2, which has IEEE 1394 (FireWire) ports. Key features to look for in a PC that handles large amounts of video include a fast CPU, FireWire ports, and lots of storage space.

"Certainly you want a fast processor—700-MHz or higher," says Mike Iampietro, senior product manager at Pinnacle Systems, a digital video com-



pany. Choosing a Pentium 4 or Athlon processor depends on individual needs and software, though our PC WorldBench 2000 tests show the Pentium

4 to have a slight advantage.

Iampietro recommends that you work with at least 128MB of RAM—but you can never have too much for video editing.

Hard-drive speed and size influence video editing: Linking two drives via an IDE RAID card provides faster performance when the components are hooked up in the typical configuration. "It used to be that only a SCSI drive could produce the speed for video capture or playback," says Sam Chu, marketing director for Polywell. "Today, IDE RAID cards [have]

equal or even better performance than old SCSI drives."

Iampietro recommends a large, dedicated hard drive just for video, as well as a state-of-the-art graphics card with 3D muscle for previewing special effects and memory-intensive graphics. The most common means of video input is a FireWire port. Look for ports on the front of a PC, Iampietro says, where they are easier to reach.

Steel yourself for sticker shock: An entry-level system can run from \$2000 to \$5000, depending on the components.

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- 24X Low-Profile CD-ROM (DVD option)
- Sony 3.5" Floppy Drive
- Integrated High-Res. 3D AGP Graphics
- Integrated Enhanced Audio
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TOP 10 VALUE PCs

| | VALUE SYSTEM | Issue tested | Overall rating | Street price (7/13/01) | PC WorldBench 2000 performance score ¹ | Faster | Comments |
|-----------------------------|---|--------------|----------------|-------------------------|---|-----------------|---|
| 1 | Best BUY Dell OptiPlex GX150 find.pcworld.com/10367 | June 01 | 84 | Average: \$1401 | Windows 2000 | Very good 190 | Well designed for easy access and expansion; includes corporate management and security features. |
| 2 | Best BUY ABS Conquest GL find.pcworld.com/10368 | Apr 01 | 84 | Inexpensive: \$1099 | Windows Me | Very good 160 | Impressive monitor and simple assembly aided by color-coded ports and a setup poster. |
| 3 | Tangent Valera find.pcworld.com/10371 | May 01 | 84 | Inexpensive: \$1195 | Windows 2000 | Outstanding 216 | High-caliber performance, but a mediocre monitor and cluttered interior; price drops by \$100. |
| 4 | Polywell Poly 830K7-1000 find.pcworld.com/10370 | Aug 01 | 83 | Inexpensive: \$1150 | Windows Me | Outstanding 161 | Includes a hard drive that's easy to remove (through the front of the tower) plus partition backup software. |
| 5 | Premio Apollo 815EP find.pcworld.com/11343 | NEW | 82 | Very inexpensive: \$999 | Windows Me | Outstanding 161 | Inexpensive, with basic components but high performance and lots of internal space. ★★☆☆☆ |
| 6 | MicronPC ClientPro CN find.pcworld.com/10369 | Oct 00 | 81 | Average: \$1303 | Windows 98 SE | Very good 158 | Bundled manageability tools, adequate performance, and lots of room inside its large case; handles permit easy opening. |
| 7 | Sys TaskMaster 950D find.pcworld.com/11461 | NEW | 79 | Average: \$1352 | Windows 2000 | Very good 191 | The first Duron-950 system we've tested delivers a boost in speed over Duron-850 machines and includes a good monitor. ★★☆☆☆ |
| 8 | HP E-pc C10 find.pcworld.com/10122 | Sept 01 | 77 | Average: \$1518 | Windows 2000 | Very good 189 | Hefty corporate tools—including manageability software, a case lock, and a rear port-control system—but little room to grow. (★★★☆☆ Sept 01) |
| 9 | Sys TaskMaster 850D find.pcworld.com/10373 | May 01 | 77 | Inexpensive: \$1150 | Windows 2000 | Good 175 | Delivers powerful performance at low cost but offers few extras; Sys does not include a system manual. |
| 10 | Compaq Deskpro EN SFF find.pcworld.com/11344 | Apr 01 | 76 | Average: \$1533 | Windows 98 SE | Very good 159 | Small case allows easy, tool-less access to the interior, though there's little room for growth and the PC includes few installed components. |
| Percent of overall rating ▶ | | | | 20 percent | 20 percent | | |

See find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ A system's performance word score is relative to the scores earned by other PCs running the same operating system. See "Your Guide to the Top 100" (find.pcworld.com/11080) for more details.

NEW ENTRIES ON THIS MONTH'S value chart include Premio's Apollo 815EP at number five: This \$999 system includes Intel's LANDesk Client Manager, Microsoft Office XP Small Business Edition, and lots of expansion room. Sys's TaskMaster 950D, the first system we've tested that comes with a Duron-950 processor, hits the chart at number seven.

1 Dell OptiPlex GX150

Best BUY **What's Hot:** Upgrading or performing maintenance on Dell's OptiPlex GX150 is easy. Pressing a button on either side of the curvy, gray-and-black desktop case releases the lid, which swings up to reveal a small but well-arranged interior. You can remove cards, drives, the power supply, or the motherboard simply by flipping the appropriate green lever and taking them out. No slowpoke, the GX150 earned a score of 190 on our PC WorldBench 2000 tests, above the average mark for similar 933-MHz Pentium III systems running Windows 2000.

What's Not: The system's rear wall—which supports the PCI slot cage—seems a bit flimsy. Printed documentation is somewhat sparse, consisting of a monitor manual, an OS manual, and a system guide with basic setup information. (You can find additional documentation on the included OptiPlex Resource CD-ROM or on Dell's Web site.)

What Else: The OptiPlex GX 150 contains a number of corporate extras: remote Wake-on-LAN, Dell's OpenManage software, a sturdy twin-loop case lock, and chassis-intrusion detection. It also gives security-conscious administrators remote

control over user access to various ports and drives. The 17-inch Dell E771p monitor rendered our test images in vibrant colors, and 12-point text was clear and legible at 1024 by 768 resolution, though it blurred a bit at the maximum resolution of 1280 by 1024. A basic 8X/4X/32X CD-RW drive, though not a top performer, lets you copy CDs and burn data backups. Two of the system's four USB ports are within easy reach on the front of the case. **Upshot:** This feature-rich, \$1401 system offers something for everyone in your company—from system administrators to cost accountants to end users.

2 ABS Conquest GL

Best BUY **What's Hot:** Colors on the 19-inch ADI E66 monitor looked rich, and text appeared clean, blurring only slightly at the top resolution of 1600 by 1200. The multimedia accessories include a strong three-speaker Cambridge SoundWorks

Visit find.pcworld.com/12021 for reviews of all products ranked in this chart or tested this month.

| BASE CONFIGURATION | | | | | | | | Extra features | Design/ documentation | Vendor's reliability/ service |
|---------------------|------------------|--------------------|-----------------------------------|---------------------------|---------------------------|--------------------|---|---------------------------|---------------------------------|-------------------------------------|
| CPU | RAM (MB/type) | Hard drive (GB) | Monitor size (diagonal inches) | Graphics | Case type ¹ | Open bays/slots | | | | |
| Pentium III-933 | 128/ SDRAM | 20 | 17 | Dell TNT2 Pro | Desktop | 0/2 | Good: 8X/4X/32X CD-RW drive, network adapter, Wake-on-LAN, Dell LegacySelect, OpenManage software | Average/ Average | Outstanding/ Good | |
| Athlon- 1100 | 128/ SDRAM | 30 | 19 | Gigabyte TNT2 M64 | Midsize tower | 4/2 | Very good: 16X DVD-ROM drive, V.90 modem, network adapter, Corel WordPerfect Office 2000 | Very good/ Outstanding | ³ /Fair ³ | |
| Athlon- 1200 | 256/ SDRAM | 30 | 17 | EVGA E-GeForce2 MX | Midsize tower | 4/4 | Good: 12X-40X CD-ROM drive, network adapter, Corel WordPerfect Office 2000 | Good/ Average | ³ /Fair ³ | |
| Athlon- 1000 | 256/ SDRAM | 40 | 17 | MicroStar MS-8818 | Midsize tower | 3/4 | Outstanding: 16X DVD-ROM drive, 12X/10X/32X CD-RW drive, V.90 modem, network adapter | Good/ Average | ³ /Fair ³ | |
| Pentium III-1000 | 128/ SDRAM | 30 | 17 | ATI Rage Fury Pro | Midsize tower | 5/5 | Good: 22X-52X CD-ROM drive, network adapter, Intel LANDesk Client Manager, Microsoft Office XP Small Business Edition | Good/ Good | ³ /Fair ³ | |
| Pentium III-933 | 128/ SDRAM | 20 | 17 | VisionTek TNT2 M64 | Midsize tower | 5/5 | Good: 40X-52X CD-ROM drive, network adapter, Norton AntiVirus 2000, Wake-on-LAN, Intel LANDesk, Microsoft Office 2000 SBE | Very good/ Average | Good/ Good | |
| Duron- 950 | 128/ SDRAM | 41 | 19 | Matrox Millennium G450 | Minitower | 2/2 | Good: 12X/10X/32X CD-RW drive, network adapter | Average/ Poor | ³ /Fair ³ | |
| Pentium III-1000 | 256/ SDRAM | 40 | 17 | Integrated Intel 815 | Compact | 0/0 | Average: 24X-40X CD-ROM drive, network adapter, Wake-on-LAN, HP E-DiagTools, TopTools | Average/ Average | Good/ Fair | |
| Duron- 850 | 128/ SDRAM | 30 | 19 | Gigabyte GA-GF1280T | Minitower | 2/2 | Good: 22X-50X CD-ROM drive, network adapter | Average/ Poor | ³ /Fair ³ | |
| Pentium III-1000 | 256/ SDRAM | 20 | 17 | Integrated Intel I752 | Compact | 0/3 | Limited: 14X-48X CD-ROM drive, network adapter | Average/ Average | Good/ Fair | |
| | 10 percent | | | | | | 10 percent | 10 percent | 30 percent | |

¹ We define vertical cases as towers (taller than 20 inches), midsized towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches).

² Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs.

Digital set and a 16X DVD-ROM drive. In case anything goes wrong, ABS offers a lifetime labor warranty to complement its parts coverage of three years.

What's Not: We rated ABS's tech support quality in response to our anonymous service calls as only Fair.

What Else: The \$1099 Conquest GL earned a score of 160 on PC WorldBench 2000. That matches the average performance of similarly equipped Athlon systems running Windows Me. Microsoft's Internet Keyboard allows smooth, quiet typing and provides ten hot-keys for quick multimedia and Internet access. Corel's WordPerfect Office 2000 and a thorough system manual came bundled with our test system. Color-coded ports and a color instruction poster make setup a snap. The Conquest GL sets aside two open PCI slots and four open drive bays (three of them externally accessible) for expansion, but some wires do clutter the otherwise

spacious interior. The system comes with both a modem and a network adapter.

Upshot: An impressive computer for the money, ABS's Conquest GL would make a solid small-office system for buyers on a tight equipment budget.

NEW ON THE CHART

5 Premio Apollo 815EP

NEW **What's Hot:** If you like to perform your own upgrades or if you don't have a lot of money to spend, this Premio might fit your plans. Priced at under a grand, the Apollo 815EP that we looked at comes equipped with an Intel 1-GHz Pentium III processor and basic components, plus lots of room to grow. Its score of 161 on our PC WorldBench 2000 tests was 6 points above the average for comparable systems running Windows Millennium Edition. The accompanying software bundle includes Microsoft Office XP Small



DELL'S OPTIPLEX GX150 keeps its top spot with office-friendly features and software.

Business Edition and Intel's LANDesk Client Manager (to connect the system to a corporate network). The plain gray midsize tower's vast, well-organized interior has five open PCI slots, three open externally accessible drive bays, and two free internal drive bays.

What's Not: In our anonymous service calls, Premio earned a rating of Fair ▶

for its tech support quality because of inaccurate answers to the more difficult questions. Tech support isn't available evenings and weekends. The flimsy keyboard accompanying our test system permits quiet typing, but its keys feel sluggish; and when you try to press its small <Backspace> key, you may accidentally hit a neighboring key instead.

What Else: The Apollo 815EP comes with a 22X-52X CD-ROM drive. After you remove two screws, you can smoothly slide the sturdy metal side panel of the case off and on along guide rails. The 17-inch Premio 719 monitor included with our test system produced brilliant, rich colors; 12-point text was quite legible at 1024 by 768 resolution, but it blurred somewhat at the maximum resolution of 1280 by 1024. The system's ATI Rage Fury Pro graphics card lacks the frills of the latest cards, but it competently handles the basics.

Upshot: The Premio Apollo 815EP is an unadorned and inexpensive business-ready system that includes a good monitor and lots of room for add-ons.

7 Sys TaskMaster 950D

NEW **What's Hot:** The TaskMaster 950D is the first machine we've tested that carries AMD's new 950-MHz Duron CPU. It earned a respectable score of 191 on our PC WorldBench 2000 tests—25 points above the average for Duron-850-based Windows 2000 systems, and 12 points above the average for Pentium III-933 systems. The configuration includes a reasonably speedy 12X/10X/32X CD-RW drive for data backup. Another nice component is the 19-inch ViewSonic Optique Q95 monitor, which displays text that blurs only at the maximum resolution of 1600 by 1200. You can connect a second monitor to the Dual Head Matrox Millennium G450 graphics board.

What's Not: True to its usual practice, Sys included documentation for the 950D's individual components, but no overall system manual. In our most recent round of anonymous calls, Sys earned an overall rating of Fair for tech support quality



SYS'S TASKMASTER 950D combines speedy performance with a strong display.

because representatives answered a couple of our questions incorrectly.

What Else: To access the interior of the standard beige Sys minitower you simply remove two thumbscrews and slide off the side panel. When reattaching it, however, aligning the slot on its side with the single-loop case lock can be tricky. You can also access the two open PCI slots without tools by removing a thumbscrew. Though two externally accessible bays are open, no internal bays in the small but uncluttered interior are available. The network interface card in our tested configuration was plugged into the Wake-on-LAN-enabled motherboard, rendering the TaskMaster 950D network-ready. The basic Sys keyboard includes three hotkeys: Sleep, Wake Up, and Power. The keyboard permits smooth typing, but the <Backspace> key is too small.

Upshot: With a graphics board that supports two monitors at once, this swift budget system will work in a small office.

TECH TREND

Cheap Chips: Low-Price CPUs Can Translate Into Good PC Buys

IN JULY 2001, Intel introduced its 1.8-GHz Pentium 4 processor and priced it \$210 higher than the company's 1.7-GHz version. But lower demand for PCs and price wars between Intel and AMD have fueled price cuts for processors across the board, and those low prices should soon translate into lower-priced desktops.

The chart at right lists price quotes from Intel and AMD and reflects per-chip charges for large-volume purchases (trays of 1000 units). Whitebox versions of the chips—items sold without manuals or extras such as heat sinks and fans—are available for roughly the same price.

The prices listed here are as of July 16, 2001, and reflect the chip makers' official quotes, but industry experts have predicted further price drops on existing chips by the end of August 2001.

As manufacturers take advantage of

low-priced processors, PC prices should fall even more—so keep an eye on these rapidly changing numbers.

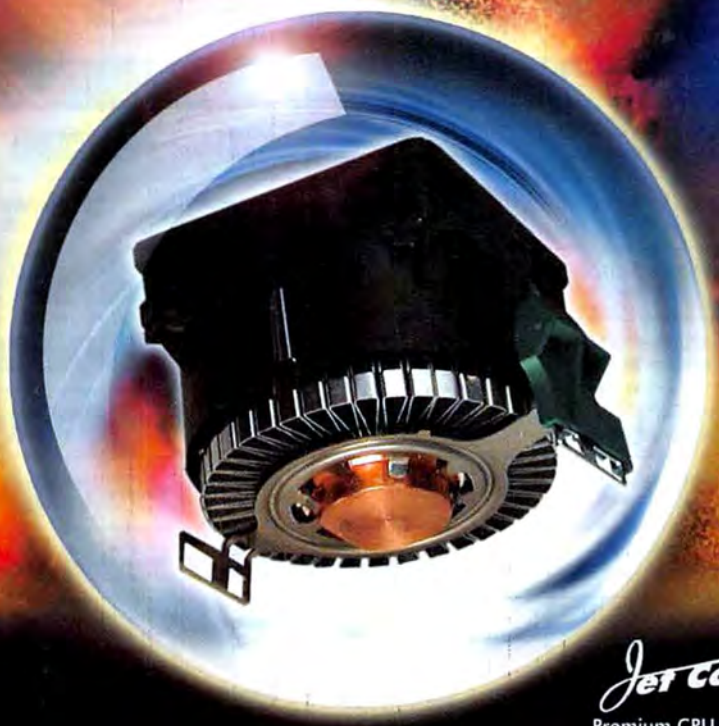
| PROCESSOR PRICES | | | |
|---|-------|-----------|-------|
| Intel Chips | | AMD Chips | |
| Pentium 4 | | Athlon | |
| 1.8-GHz | \$562 | 1.4-GHz | \$253 |
| 1.7-GHz | \$352 | 1.333-GHz | \$230 |
| 1.6-GHz | \$294 | 1.2-GHz | \$199 |
| 1.5-GHz | \$256 | 1.1-GHz | \$179 |
| 1.4-GHz | \$193 | 1-GHz | \$160 |
| 1.3-GHz | \$193 | | |
| Celeron | | Duron | |
| 900-MHz | \$89 | 950-MHz | \$122 |
| 850-MHz | \$74 | 900-MHz | \$91 |
| 800-MHz | \$64 | 850-MHz | \$78 |
| 766-MHz | \$64 | 800-MHz | \$64 |
| Price per processor on July 16, 2001, if purchased in quantities of 1000. | | | |

ALSO OF NOTE

IBM'S NEW NETVISTA X40 unites a space-saving all-in-one PC with easy-to-use management software. This sleek, black system comes with a PIII-1000 processor and runs Windows 2000. Bringing together a 15-inch flat-panel monitor and a tiny case, the NetVista X40 will look great on any desktop. Unfortunately, its integrated design means that expansion is not a possibility. Like other all-in-one systems, the X40 performed below average on our PC WorldBench 2000 tests, earning a mark of 168.

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TOP 15 NOTEBOOK PCs

| | POWER NOTEBOOK | Issue tested | Overall rating | Street price (7/13/01) | PC WorldBench 2000 performance score ¹ | Faster | Comments |
|----------------|--|-----------------------------|----------------|------------------------|---|--------|--|
| 1 | Best BUY Dell Inspiron 8000 find.pcworld.com/10440 | July 01 | 89 | Inexpensive: \$2295 | Windows Me Good 141 | | Well-rounded desktop replacement for small to medium-size businesses retains the top spot. The keyboard is noisy. |
| 2 | IBM ThinkPad T22 find.pcworld.com/11424 | NEW | 89 | Average: \$3251 | Windows 2000 Very good 183 | | Lightweight laptop sports a complete set of connections, a ThinkLight, and an extra USB port at the top of its big screen. ★★★★★ |
| 3 | Gateway Solo 9500 find.pcworld.com/10441 | July 01 | 87 | Average: \$2998 | Windows 2000 Outstanding 191 | | A heavy, powerful, multimedia-savvy desktop replacement with the largest screen available falls \$100. |
| 4 | MicronPC TransPort GX+ find.pcworld.com/10448 | Sept 01 | 85 | Average: \$2739 | Windows 2000 Good 173 | | Classy, well-appointed notebook drops \$300. Has a 1400-by-1050 screen and is easy to upgrade. Sound is weak, however. (★★★★☆ Sept 01) |
| 5 | WinBook Z1 find.pcworld.com/10442 | Aug 01 | 85 | Average: \$3239 | Windows 2000 Outstanding 195 | | The fastest notebook we've tested includes a large screen and plentiful storage. But the design is clunky and support hours are limited. |
| VALUE NOTEBOOK | | Percent of overall rating ▶ | | 14 percent | 20 percent | | |
| 1 | Best BUY Dell Inspiron 4000 find.pcworld.com/10449 | July 01 | 88 | Average: \$1637 | Windows Me Very good 142 | | Slim, attractive laptop lets you swap in colored palm rests and screen-panel backs. |
| 2 | Best BUY Dell Latitude C600 find.pcworld.com/10450 | June 01 | 84 | Very expensive: \$2635 | Windows 2000 Very good 164 | | Lightweight corporate notebook comes ready for wireless networking and performs above average for its processor class. |
| 3 | Compaq Presario 1700T-850 find.pcworld.com/10451 | Feb 01 | 83 | Average: \$1622 | Windows Me Very good 145 | | Striking metallic-accented black notebook includes a row of programmable Internet shortcut buttons. |
| 4 | MicronPC TransPort GX+ find.pcworld.com/10453 | Apr 01 | 82 | Expensive: \$2299 | Windows 2000 Good 154 | | Handsome notebook accepts affordable expansion components. Performance and battery life are unimpressive. Sheds \$250 from price. |
| 5 | Enpower ENP-325W2 find.pcworld.com/10454 | Feb 01 | 81 | Average: \$1999 | Windows Me Very good 145 | | Utilitarian system simplifies access to components. Overhanging screen panel makes the unit awkward to carry. Drops \$200 this month. |
| 6 | Compaq Presario 1800 find.pcworld.com/10446 | Sept 01 | 81 | Expensive: \$2399 | Windows Me Outstanding 151 | | Sleek, black-and-silver notebook offers long battery life and doubles as a jukebox with array of CD-player controls. (★★★★☆ Sept 01) |
| 7 | HP Omnibook 500 find.pcworld.com/10456 | Mar 01 | 80 | Expensive: \$2294 | Windows 2000 Average 149 | | Attractive ultraportable becomes a featherweight after you remove base unit that provides two modular bays and most port connections. |
| 8 | WinBook J1 find.pcworld.com/10457 | July 01 | 80 | Average: \$1697 | Windows Me Very good 147 | | Lightweight all-in-one notebook pumps impressive speed and battery life from a desktop Pentium III processor. |
| 9 | Micro Express NP4800D find.pcworld.com/10455 | Mar 01 | 80 | Average: \$1599 | Windows 98 SE Good 139 | | Well-appointed for the price, this laptop permits easy upgrading. Documentation is vague and sometimes misleading. |
| 10 | Toshiba Satellite 2805-S402 find.pcworld.com/11425 | NEW | 80 | Expensive: \$2399 | Windows Me Very good 144 | | Slightly thickset notebook lacks docking connection but has handy CD-player buttons, good sound, and a large keyboard. ★★★★★ |
| | | Percent of overall rating ▶ | | 17 percent | 17 percent | | |

See find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. See "Your Guide to the Top 100" at find.pcworld.com/11080 for more details.

WHAT MAKES THE ideal laptop? Most of us would probably agree that we'd love it to have the latest features, be light, and have a price south of \$1000. And as long as you're at it, throw in a handsome case that's tough enough to withstand short falls, or even drops onto concrete.

While we dream on, laptop manufacturers are coming closer to producing the perfect portable. One envelope pusher is IBM, whose new ThinkPad T22 nips at the heels of the returning champ, the Dell Inspiron 8000,

for this month's power Best Buy. At only 5.5 pounds, yet fully equipped with a 14.1-inch screen and cutting-edge components, the T22 strikes a graceful balance between heft and hardware. Unfortunately, the price isn't so dreamy—you'll have to part with \$3251 for this Pentium III-1000/700-based notebook.

Only one other new laptop made our charts this month. Toshiba's Satellite

Visit find.pcworld.com/11744 for reviews of all products ranked in this chart or tested this month.

| BASE CONFIGURATION | | | | | | | Extra features | Overall design | Battery life (hours:min) ² | Average weight (pounds) ³ | Vendor's reliability/ service |
|----------------------|-----------------|----------|-----------------|----------------------|--------------------|---|----------------|----------------|---------------------------------------|--------------------------------------|-------------------------------|
| CPU | Screen (inches) | RAM (MB) | Hard drive (GB) | Pointing device | Multi-purpose bays | | | | | | |
| Pentium III-900/700 | 15 | 128 | 20 | Touchpad, eraserhead | 1 | Good: 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Works 2001 | Outstanding | Average/ 2:54 | Heavy/ 9.2 | Good/Good | |
| Pentium III-1000/700 | 14.1 | 256 | 32 | Eraserhead | 1 | Good: 8X DVD-ROM drive, built-in modem and network adapter, Lotus SmartSuite Millennium Edition | Very good | Good/ 3:16 | Average/ 6.8 | Good/Good | |
| Pentium III-1000/700 | 15.7 | 256 | 20 | Touchpad | 2 | Good: 8X DVD-ROM drive, LS-120 drive, built-in modem and network adapter | Very good | Good/ 3:05 | Heavy/ 9.0 | Fair/Fair | |
| Pentium III-900/700 | 15 | 256 | 30 | Touchpad | 1 | Good: 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Office 2000 Small Business Edition | Outstanding | Good/ 3:08 | Heavy/ 8.1 | Fair/Fair | |
| Pentium III-1000/700 | 15 | 256 | 30 | Touchpad | 2 | Good: combination 8X DVD-ROM and 4X/4X/24X CD-RW drive, built-in modem | Very good | Good/ 3:06 | Heavy/ 8.5 | Fair/Good ⁴ | |
| | 5 percent | | | | | 5 percent | | 10 percent | 8 percent | 8 percent | 30 percent |
| Pentium III-900/700 | 14.1 | 128 | 10 | Touchpad, eraserhead | 2 | Good: 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Works 2001 | Very good | Good/ 3:14 | Average/ 8.0 | Good/Good | |
| Pentium III-750/600 | 14.1 | 128 | 10 | Touchpad, eraserhead | 1 | Average: 10X-24X CD-ROM drive, PC Card network adapter, built-in 802.11b wireless card | Outstanding | Good/ 3:45 | Average/ 7.8 | Good/Good | |
| Pentium III-850/700 | 14.1 | 128 | 32 | Touchpad | 1 | Average: 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Word 2000 | Very good | Average/ 2:25 | Average/ 7.4 | Fair/Fair | |
| Pentium III-800/650 | 15 | 128 | 20 | Touchpad | 1 | Good: 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Office 2000 SBE | Outstanding | Average/ 2:45 | Heavy/ 8.2 | Fair/Fair | |
| Pentium III-850/700 | 15 | 128 | 10 | Touchpad, eraserhead | 1 | Average: 8X DVD-ROM drive, built-in modem | Very good | Good/ 3:24 | Heavy/ 8.1 | '/Good ⁴ | |
| Pentium III-1000/700 | 15 | 128 | 20 | Touchpad | 0 | Good: 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Works 2000 | Average | Good/ 3:36 | Heavy/ 8.4 | Fair/Fair | |
| Pentium III-600/500 | 12.1 | 128 | 10 | Eraserhead | 2 | Average: 12X-24X CD-ROM drive, built-in modem and network adapter | Outstanding | Good/ 3:09 | Average/ 7.5 | Good/Fair ⁴ | |
| Pentium III-1000 | 13.3 | 192 | 10 | Touchpad | 0 | Average: 8X DVD-ROM drive, built-in modem and network adapter | Average | Average/ 2:23 | Average/ 7.1 | Fair/Good ⁴ | |
| Pentium III-800/650 | 14.1 | 128 | 20 | Touchpad | 2 | Average: 6X DVD-ROM drive, built-in modem, IEEE 1394 port, TV-out port | Average | Average/ 2:27 | Heavy/ 8.3 | '/Fair ⁴ | |
| Pentium III-850/700 | 15.1 | 128 | 20 | Eraserhead | 0 | Good: combo 6X DVD-ROM and 4X/4X/24X CD-RW drive, built-in modem and network adapter, Lotus SmartSuite Millennium Ed. | Average | Average/ 2:24 | Heavy/ 8.8 | Fair/Fair | |
| | 5 percent | | | | | 5 percent | | 10 percent | 8 percent | 8 percent | 30 percent |

² Unless otherwise noted, all notebooks come with a lithium ion battery.

³ Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.

⁴ Due to insufficient data from survey, score is based on responses to anonymous calls for tech support.

⁵ Insufficient data to give a rating.

2805-S402, at the lowest spot on the value list, is heavy at 7.5 pounds, but audiophiles will love its top-notch speakers.

Among the models that didn't make the cut: A Celeron-650-based version of WinBook's Z1 burned up the track with its PC WorldBench 2000 score of 157—it's faster than some Pentium III-750 notebooks we've tested. However, the Z1 lacks a built-in network adapter, and its screen

panel overlaps the front when closed.

Compaq's new Presario 800, the company's first crack at a consumer-oriented ultraportable, has good looks and a waif-like 3.5-pound weight going for it, but little else. We disliked the 1-hour battery life, the toylike keyboard, and having to shut down the notebook every time we wanted to attach the DVD-ROM drive.

—Carla Thornton ►

TOSHIBA'S SATELLITE 2805-S402 offers up great sound quality.



TOP 15 HOME PCs

| | POWER SYSTEM | Issue tested | Overall rating | Street price (7/13/01) | PC WorldBench 2000 performance score ¹ | Faster | Comments |
|--------------|--|-----------------------------|----------------|--------------------------|---|-----------------|---|
| 1 | Best BUY MicronPC Millennia Max XP2 find.pcworld.com/11620 | NEW | 89 | Average: \$2397 | Windows Me | Outstanding 193 | The latest speed demon from the Millennia Max line inherits the top spot from its identically named predecessor. ★★★★★ |
| 2 | HP Pavilion 9800 find.pcworld.com/10384 | Aug 01 | 85 | Inexpensive: \$2099 | Windows Me | Good 177 | Drops \$50 this month and comes equipped for video editing. Fine text on HP's Pavilion V90 monitor lacks sharpness at most settings. |
| 3 | Alienware Aurora DDR find.pcworld.com/11081 | NEW | 84 | Very expensive: \$3599 | Windows Me | Outstanding 193 | Stunning, jet-black system wowed us with its speed and sound quality, but it doesn't come cheap. (★★★★★ Sept 01) |
| 4 | Gateway Select 1400 find.pcworld.com/11622 | NEW | 83 | Very inexpensive: \$1749 | Windows Me | Very good 181 | Smartly constructed system comes equipped for home networking, with both ethernet and phone-line adapters. ★★★★★ |
| 5 | Compaq Presario 7000Z find.pcworld.com/10383 | July 01 | 83 | Average: \$2134 | Windows Me | Good 176 | A first-class SOHO PC with digital-imaging features drops \$62 this month, but Compaq's reliability score and warranty could be better. |
| VALUE SYSTEM | | Percent of overall rating ▶ | | 10 percent | 20 percent | | |
| 1 | Best BUY HP Pavilion 9820 find.pcworld.com/10386 | May 01 | 81 | Average: \$1299 | Windows Me | Average 153 | Easy to set up and use; the V70 monitor has great color fidelity. Among its drawbacks: limited tech support and a poor sound system. |
| 2 | Best BUY ABS Multimedia System 2 find.pcworld.com/10394 | Apr 01 | 81 | Inexpensive: \$1019 | Windows Me | Good 161 | The system's 19-inch monitor displays sharp text, but 3D game performance and DVD movie playback were disappointing. Price drops \$110. |
| 3 | HP Pavilion 9800A find.pcworld.com/11623 | NEW | 80 | Average: \$1149 | Windows Me | Good 160 | An average-quality system housed in a giant case with plenty of room for easy expansion. ★★☆☆☆ |
| 4 | NuTrend Athlon Special 2 find.pcworld.com/10401 | Sept 01 | 80 | Inexpensive: \$869 | Windows Me | Outstanding 183 | Sprightly system runs business applications well and cuts costs with an older graphics card. \$130 price drop. (★★★★★ Sept 01) |
| 5 | Gateway Performance 1400 find.pcworld.com/10861 | NEW | 76 | Average: \$1424 | Windows Me | Average 152 | A good-looking, well-constructed system for first-time buyers, but Gateway skimps on some of the components. ★★☆☆☆ |
| 6 | Polywell Poly KLX-850D find.pcworld.com/10396 | June 01 | 76 | Inexpensive: \$950 | Windows Me | Average 141 | Despite its sharp images on DVD playback, the bundled ViewSonic Optiquest monitor failed to translate warm tones accurately. |
| 7 | IBM NetVista X40i find.pcworld.com/11624 | NEW | 74 | Expensive: \$1510 | Windows Me | Average 151 | Svelte all-in-one black PC looks great. Its LCD monitor displays text cleanly, but graphics are only so-so. ★★☆☆☆ |
| 8 | Polywell Poly K7-1000 find.pcworld.com/10502 | Aug 01 | 74 | Average: \$1150 | Windows Me | Good 161 | A model of functionality, this PC handles most any app well, but it has a poorly conceived design inside and out. Display quality is also poor. |
| 9 | Compaq Presario 5000 find.pcworld.com/11625 | NEW | 73 | Average: \$1415 | Windows Me | Average 138 | A handsome starter PC for basic Internet and light-duty home-office work, but too slow for power users. ★★☆☆☆ |
| 10 | HP Pavilion 7800 find.pcworld.com/10397 | July 01 | 73 | Inexpensive: \$1039 | Windows Me | Average 147 | Attractive two-tone PC is hampered by integrated graphics and sound that offer pared-down performance. |
| | | Percent of overall rating ▶ | | 15 percent | 15 percent | | |

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. See "Your Guide to the Top 100" at find.pcworld.com/11080 for more details.

² Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches).

SEVEN SYSTEMS are new to this month's chart, but familiar names occupy the top positions. MicronPC's updated Millennia Max XP2, now with a 1.4-GHz Athlon processor, replaces its 1.3-GHz sibling of the same name in the top power spot. Its dazzling PC WorldBench 2000 score of 193 is the second-highest we've seen for a Windows Me-equipped PC.

Equaling the Millennia Max XP2's performance mark is the 1.4-GHz Aurora DDR from Alienware, a specialty vendor of gaming PCs. Alien-

ware's first entrant in our *Top 15 Home PCs* competition made quite an impression, with a towering, jet-black case and matching components as well as thundering sound courtesy of Klipsch's Pro-Media 5.1 speakers. A price of \$3599 dims the Aurora DDR's glow, however. Another gaming-machine vendor, Falcon Northwest, also competed for the first time this month. Scoring 197 on PC

Visit find.pcworld.com/11640 for reviews of all products ranked in this chart or tested this month.

| BASE CONFIGURATION | | | | | | Extra features ³ | Graphics quality | Setup and ease of use | Vendor's reliability/service |
|--------------------|---------------|-----------------|------------------|---------------------------------------|------------------------|---|------------------|-----------------------|------------------------------|
| CPU | RAM (MB/type) | Hard drive (GB) | Monitor (inches) | Graphics | Case type ² | | | | |
| Athlon-1400 | 256/DDR SDRAM | 60 | 19 | VisionTek GeForce3 | Midsized tower | Very good: 16X DVD-ROM drive, 12X/10X/32X CD-RW drive, network adapter, Microsoft Office XP Small Business Edition, Norton AntiVirus 2001 | Very good | Average | Good/Good |
| Athlon-1333 | 256/DDR SDRAM | 75 | 19 | Asus AGP-V7700 GeForce2 GTS Pro | Midsized tower | Very good: 16X DVD-ROM drive, 12X/8X/32X CD-RW drive, network adapter, Microsoft Works 2001, Pinnacle Studio DV with IEEE 1394 card | Very good | Average | Fair/Fair |
| Athlon-1400 | 256/DDR SDRAM | 60 | 22 | ELSA Gladiac 920 | Tower | Outstanding: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, network adapter, Microsoft Works 2001, Pinnacle Studio DV, IEEE 1394 card, joystick | Very good | Good | +/+ |
| Athlon-1400 | 128/SDRAM | 40 | 17 | VisionTek GeForce2 Ultra ¹ | Midsized tower | Very good: 16X DVD-ROM drive, 12X/8X/32X CD-RW drive, network adapter, Microsoft Works 2001, Quicken 2001, Norton AntiVirus 2001 | Good | Good | Fair/Fair |
| Athlon-1200 | 256/DDR SDRAM | 75 | 19 | Creative Labs Annihilator 2 Ultra | Midsized tower | Good: 16X DVD-ROM drive, 12X/4X/32X CD-RW drive, network adapter, Word 2000, Quicken TurboTax, Pinnacle Studio DV with IEEE 1394 card | Very good | Good | Poor/Fair |
| 10 percent | | | | | | 10 percent | 15 percent | 5 percent | 30 percent |
| Pentium III-1000 | 128/SDRAM | 60 | 17 | Asus AGP-V7700 GeForce2 GTS Pro | Tower | Good: 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, network adapter, Microsoft Office 2000 SBE | Good | Average | Fair/Fair |
| Athlon-1100 | 128/SDRAM | 30 | 19 | Leadtek WinFast GeForce2 MX | Midsized tower | Average: 16X DVD-ROM drive, Corel WordPerfect Office 2002 | Good | Good | +/Fair⁴ |
| Athlon-1000 | 128/DDR SDRAM | 40 | 17 | Asus AGP-V7100 GeForce2 MX | Tower | Good: 8X/4X/32X CD-RW drive, network adapter, Microsoft Works 2001 | Good | Average | Fair/Fair |
| Athlon-1333 | 128/SDRAM | 30 | 17 | MicroStar MS-8808 TNT2 M64 | Midsized tower | Average: 16X DVD-ROM drive, network adapter, Corel WordPerfect Office 2000 | Limited | Average | +/Fair⁴ |
| Pentium 4-1400 | 128/RDRAM | 20 | 17 | VisionTek RIVA TNT2 M64 | Midsized tower | Good: 20X-48X CD-ROM drive, 8X/4X/32X CD-RW drive, network adapter, Microsoft Works 2001, Norton AntiVirus 2001 | Average | Average | Fair/Fair |
| Duron-850 | 128/SDRAM | 30 | 17 | Leadtek WinFast GeForce2 MX | Midsized tower | Average: 12X DVD-ROM drive, network adapter | Good | Outstanding | +/Fair⁴ |
| Pentium III-1000 | 128/SDRAM | 20 | 15 | Integrated SIS 630 | All-in-one | Very good: 8X DVD-ROM drive, network adapter, Lotus SmartSuite Millennium Edition | Limited | Good | Good/Fair |
| Athlon-1000 | 256/SDRAM | 30 | 17 | MicroStar MS-8818 GeForce2 MX | Midsized tower | Average: 16X DVD-ROM drive | Good | Average | +/Fair⁴ |
| Duron-900 | 128/SDRAM | 40 | 17 | Creative Labs Annihilator Pro | Midsized tower | Good: 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, network adapter, Microsoft Word 2000, Quicken 2001 New User Edition | Good | Outstanding | Poor/Fair |
| Pentium III-1000 | 128/SDRAM | 40 | 17 | Integrated Intel 810 | Midsized tower | Average: 16X DVD-ROM drive, Microsoft Works 2000 | Limited | Good | Fair/Fair |
| 10 percent | | | | | | 10 percent | 10 percent | 10 percent | 30 percent |

¹ Unless otherwise noted, all home PCs come with a V.90 modem.

² Insufficient data to give a rating.

³ System now sold with a VisionTek GeForce3 graphics card.

⁴ Due to insufficient data from survey, score is based on responses to anonymous calls for tech support.

WorldBench 2000, Falcon's 1.4-GHz Mach V set a performance record for Windows Me systems, but it lacks the Aurora's polish. At \$3195, it's also pricey.

Our value chart includes handsome PCs that set you back quite a bit less. A noteworthy newcomer is IBM's 1-GHz NetVista X40i, a svelte PC with an integrated LCD monitor and surprisingly good performance for an all-in-one sys-

tem. Another new model, Compaq's Presario 5000, is nicely packaged for first-time buyers or for families seeking a second PC for light-duty Web surfing and office work. But the top of our value chart belongs to two veteran systems: HP's Pavilion 9820 and ABS's Multimedia System 2 each slid up the scale a notch after IBM discontinued last month's number one NetVista A40i. —Sean Captain ▶



SUCCESSOR TO THE THRONE: MicronPC continues to top our Power chart.



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TOP 10 PRINTERS

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Visit find.pcworld.com/11800 for reviews of all products ranked in this chart or tested this month.

THE MONOCHROME LASER CHART returns this month with new models for both small and large offices. On the small-office chart, Brother's HL-1440 replaces the HL-1240; the new model adds improved image quality for the same starting price of \$299; an ethernet card is optional. For \$100 less,

Samsung's ML-1210 offers a compact design with a maximum paper capacity of 300 pages, making this nonnetworkable printer a good fit for home offices. On the corporate end, the GCC Elite 21N offers admirable text printing speeds, but its gray-scale images looked sandblasted and excessively pale. ▶

| | SMALL-OFFICE LASER | Street price (7/13/01) | Overall rating | Speed for plain text/full-page graphics (ppm) | Print quality for text/graphics | Comments |
|-----------------|---|------------------------|----------------|---|---------------------------------|--|
| 1 | Best BUY Minolta-QMS PagePro 1100L find.pcworld.com/11665 | \$199 | 87 | 8.6/4.7 | Very good/Adequate | FEATURES: Rated 10 ppm. Standard 4MB of RAM, 600-by-600-dpi maximum resolution, 150 sheets input, 100 output. SUMMARY: The inexpensive 1100L drops by \$50 this month. It offers lightning-quick graphics printing, though the image itself leaves a bit to be desired. Its standard paper tray holds only 150 pages, but you can add one optional paper tray. There is no USB port. |
| 2 | Brother HL-1440 find.pcworld.com/11581 NEW | \$299 | 85 | 8.6/3.1 | Very good/Very good | FEATURES: Rated 15 ppm. Standard 2MB of RAM, 1200-by-600-dpi maximum resolution, 250 sheets input, 150 output. SUMMARY: Brother's HL-1440 laser replaces the HL-1240 with slightly faster performance and smoother gray-scale output. Like its HL-1240 predecessor, the HL-1440 has 2MB of RAM. For an additional \$299 you can get an optional ethernet card. ★★☆☆☆ |
| 3 | IBM Infoprint 12 find.pcworld.com/11569 | \$399 | 82 | 9.5/3.1 | Very good/Good | FEATURES: Rated 12 ppm. Standard 4MB of RAM, 1200-by-1200-dpi maximum resolution, 350 sheets input and output. SUMMARY: This speedy unit prints very sharp text, with dark and precise lines; its \$205 ethernet option helps make the Infoprint 12 a good choice for small workgroups. Consumables' costs (\$150 per toner cartridge) will add up, though, if you do a lot of printing. |
| 4 | Samsung ML-1210 find.pcworld.com/11582 NEW | \$199 | 82 | 7.1/2.9 | Good/Adequate | FEATURES: Rated 12 ppm. Standard 8MB of RAM, 600-by-600-dpi maximum resolution, 150 sheets input, 100 output. SUMMARY: This low-cost unit zipped through our speed tests, but images appeared a bit banded on our gray-scale tests, and letters were slightly less defined than with other printers. It handles only 150 pages per tray, but you can add another tray. ★★☆☆☆ |
| 5 | Lexmark Optra E312 find.pcworld.com/11570 | \$399 | 79 | 7.9/0.7 | Very good/Adequate | FEATURES: Rated 10 ppm. Standard 4MB of RAM, 1200-by-1200-dpi maximum resolution, 150 sheets input, 100 output. SUMMARY: Prints sharp, clean text quickly enough for a home office, but dawdles on graphics and produces dark and muddled gray-scale images. The standard paper tray doesn't hold much, and unfortunately you can't add trays. |
| CORPORATE LASER | | | | | | |
| 1 | Best BUY Xerox DocuPrint N2125 find.pcworld.com/11600 | \$1299 | 86 | 11.7/3.7 | Very good/Very good | FEATURES: Rated 21 ppm. Standard 32MB of RAM, 1200-by-1200-dpi maximum resolution, 650 sheets input, 500 output. SUMMARY: Detailed prints, lots of paper-handling features, and a standard ethernet interface make the N2125 ideal for larger workgroups. You can add two optional trays (each priced at \$298) to increase the capacity of this workhorse laser to 1750 sheets. |
| 2 | IBM Infoprint 21 find.pcworld.com/11560 | \$1179 | 85 | 12.2/1.5 | Very good/Good | FEATURES: Rated 21 ppm. Standard 32MB of RAM, 1200-by-1200-dpi maximum resolution, 650 sheets input, 500 output. SUMMARY: Swiftly delivers clean, sharp text. Its formidable array of options—including two additional trays, an envelope feeder, a duplexer, and a collator—and network management software make this unit very suitable for large offices. |
| 3 | HP LaserJet 4100n find.pcworld.com/11561 | \$1549 | 83 | 13.6/4.5 | Excellent/Good | FEATURES: Rated 25 ppm. Standard 32MB of RAM, 1200-by-1200-dpi maximum resolution, 600 sheets input, 300 output. SUMMARY: HP offers an optional infrared port on top of its standard ethernet, so notebook users can print directly from their laptops. This unit blazed through our speed tests, and it reproduces text superbly. The price remains steep despite a \$30 reduction. |
| 4 | GCC Elite 21N find.pcworld.com/11580 NEW | \$1299 | 82 | 12.1/2.3 | Very good/Adequate | FEATURES: Rated 21 ppm. Standard 16MB of RAM, 1200-by-1200-dpi maximum resolution, 650 sheets input, 500 output. SUMMARY: Handles up to 1750 pages in a maximum of four paper trays; prints line art exceptionally well, but gray-scale output is merely adequate. GCC sells an optional duplexer unit for \$289 and toner cartridges starting at \$189. ★★☆☆☆ |
| 5 | Brother HL-1670N find.pcworld.com/11662 | \$749 | 82 | 10.8/3.2 | Very good/Very good | FEATURES: Rated 16 ppm. Standard 16MB of RAM, 1200-by-1200-dpi maximum resolution, 350 sheets input, 250 output. SUMMARY: Built for small workgroups, this corporate laser runs reasonably fast, produces clean prints and comes standard with both a duplexer and a built-in ethernet adapter. Its limited paper capacity best suits it for low-volume printing. |

HOW WE TEST: The overall rating for monochrome laser printers is based on print quality (25 percent), price (25 percent), features (15 percent), ease of use (15 percent), speed (10 percent), and service and support (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings.



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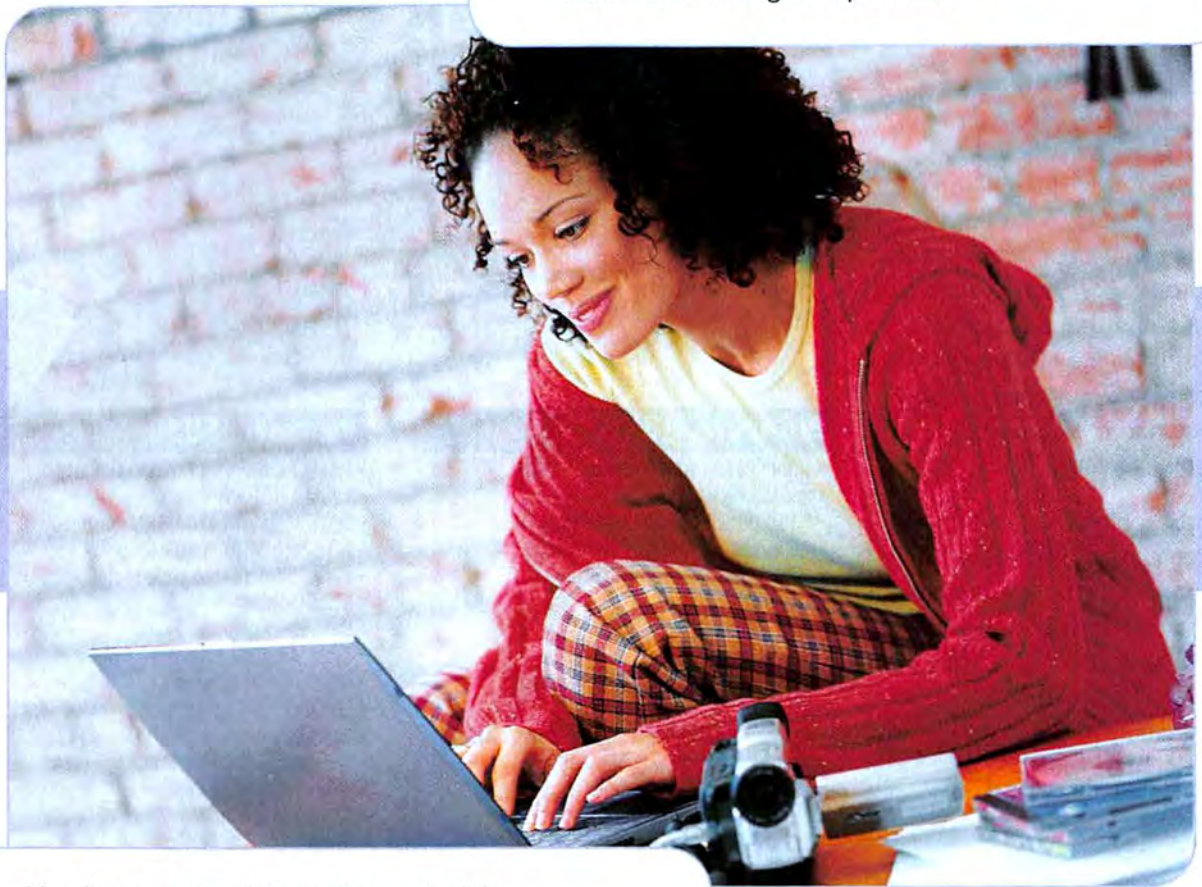
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TOP 10 MONITORS

Visit find.pcworld.com/12000 for reviews of all products ranked in this chart or tested this month.

THIS MONTH'S BIG-MONITORS chart features hot choices for business and professional users. Now is an excellent time to buy: Display quality is high and prices are low, with five of our Top 10 models priced under \$600 and with only one model that costs more than \$1000. Six of the ten CRT moni-

tors on this month's chart are brand new, including screens from Cornerstone Peripherals, CTX, Hansol, Hewlett-Packard, Iiyama, and Sony. Whether you plan to edit photos, play graphics-intensive PC games, or crunch numbers, there's a 21-incher listed here to suit your needs. ▶

| | 21-INCH MONITOR | Maximum resolution (at minimum refresh rate of 70 Hz) | Street price (7/15/01) | Overall rating | Quality of text/graphics | Comments |
|----|---|---|------------------------------|-------------------|-----------------------------|---|
| 1 | Best Buy Optiquest Q115 find.pcworld.com/10579 | 1600 by 1200 | \$578 | 95 | Very good/ Excellent | FEATURES: 19.6-inch viewable area, .26mm dot pitch tube, ¹ up to 88-Hz refresh rate, ² three-year warranty, 24-hour daily toll-free support. SUMMARY: Displayed fine details in photos. Controls are well organized overall. Comprehensive documentation provides definitions of controls and instructions on how to use them. (★★★★☆ Sept 01) |
| 2 | Best Buy Iiyama Vision Master Pro 511 find.pcworld.com/11381 NEW | 1800 by 1440 | \$749 | 91 | Very good/ Very good | FEATURES: 19.9-inch viewable area, .25mm stripe pitch Diamondtron NF tube, ¹ up to 100-Hz refresh rate, ² three-year warranty, 12-hour weekday toll-free support. SUMMARY: Suitable for some professional work, the Iiyama showed good contrast and excellent detail and color in image tests. Offers user-friendly controls. (★★★★☆) |
| 3 | Hitachi CM810 find.pcworld.com/10803 | 1600 by 1200 | \$619 | 90 | Very good/ Excellent | FEATURES: 19.9-inch viewable area, .26mm dot pitch tube, ¹ up to 90-Hz refresh rate, ² five-year warranty, 12-hour weekday toll-free support. SUMMARY: Beautifully displayed our multisize-font screen. Color balance looked exceptional overall in our graphics tests. On-screen controls are comprehensive, but difficult to use. (★★★★☆ Sept 01) |
| 4 | Sampo AlphaScan 912ST find.pcworld.com/10801 | 1600 by 1200 | \$589 | 89 | Very good/ Very good | FEATURES: 19.9-inch viewable area, .25mm dot pitch tube, ¹ up to 100-Hz refresh rate, ² three-year warranty, 10-hour weekday toll-free support. SUMMARY: Compared with other monitors we tested, the Sampo displayed above-average text and graphics. Documentation explains each control and covers troubleshooting. (★★★★☆ Sept 01) |
| 5 | Cornerstone Peripherals p1650 find.pcworld.com/11380 NEW | 2048 by 1536 | \$825 | 87 | Good/ Very good | FEATURES: 19.9-inch viewable area, .25mm dot pitch tube, ¹ up to 113-Hz refresh rate, ² five-year warranty, 24-hour weekday toll-free support. SUMMARY: A cut above lower-cost business models, especially in its ability to handle high resolutions. Small fonts were slightly blurry in our Word document tests. (★★★★☆) |
| 6 | Cornerstone Peripherals C1030 find.pcworld.com/10804 | 1600 by 1200 | \$549 | 87 | Good/ Satisfactory | FEATURES: 19.8-inch viewable area, .26mm dot pitch tube, ¹ up to 89-Hz refresh rate, ² three-year warranty, 11-hour weekday toll-free support. SUMMARY: On-screen controls are confusing at first; documentation covers the basics. Menu stays up for a long time; timeout is not adjustable. Offers some advanced controls. (★★★★☆ Sept 01) |
| 7 | Hansol 2100A find.pcworld.com/11383 NEW | 1800 by 1600 | \$549 | 85 | Satisfactory/ Good | FEATURES: 20-inch viewable area, .25mm dot pitch tube, ¹ up to 100-Hz refresh rate, ² three-year warranty, 11-hour weekday toll-free support. SUMMARY: Inexpensive; simple controls, with big buttons for brightness, contrast, and menu. Realistic colors in photos, but blurry text on our multisize-font screen test. Separate RGB. (★★★★☆) |
| 8 | Sony MultiScan G520 find.pcworld.com/11382 NEW | 2048 by 1536 | \$900 | 81 | Good/ Good | FEATURES: 20-inch viewable area, .24mm stripe pitch FD Trinitron tube, ¹ up to 120-Hz refresh rate, ² one-year warranty, 24-hour daily toll-free support. SUMMARY: Fine choice for graphics or desktop publishing. Great contrast overall. Displayed vibrant, accurate colors in our test images. (★★★★☆) |
| 9 | Hewlett-Packard P1120 find.pcworld.com/11384 NEW | 1920 by 1440 | \$1009 | 81 | Excellent/ Good | FEATURES: 19.9-inch viewable area, .24mm stripe pitch FD Trinitron tube, ¹ up to 110-Hz refresh rate, ² three-year warranty, 11-hour weekday toll-free support. SUMMARY: This monitor's color controls provide easy/expert options for simple or granular adjustments. Showed crisp icons in our test screen of a Windows desktop. (★★★★☆) |
| 10 | CTX VL1300 find.pcworld.com/11462 NEW | 1800 by 1440 | \$569 | 81 | Good/ Satisfactory | FEATURES: 20-inch viewable area, .25mm dot pitch tube, ¹ up to 106-Hz refresh rate, ² three-year warranty, 12-hour weekday toll-free support. SUMMARY: Showed excellent contrast in our Excel spreadsheet, but photos were a bit dingy. Controls proved confusing for anything beyond simple adjustments. Separate RGB ports. (★★★★☆) |

HOW WE TEST: Twelve judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, spreadsheets, Web pages, and scanned photos. The overall rating is based on text and graphics quality (20 percent each), price (20 percent), viewable area (20 percent), features and ease of use (15 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings. ¹ Diagonal dot pitch. ² Maximum refresh rate at 1600 by 1200 resolution (the tested resolution for this size monitor). ³ Uses an aperture grille in which parallel wires near the sides of the screen are strung farther apart than those at the middle.

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TOP 10 GRAPHICS BOARDS

TEST
Center

Visit find.pcworld.com/11481 for reviews of all products ranked in this chart or tested this month.

THREE CARDS WITH NVidia's new GeForce2 MX-400 GPU hit the Top 10 this month. The CardExpert GeForce2 MX TwinView/Vivo Golden Sample goes straight to the top of the chart, while the AOpen MX400-A debuts at number six, and the MSI StarForce 826 MX400 squeaks onto the chart at

number ten with a bargain-basement price of \$95. The \$369 CardExpert GeForce3 Power Pack lands in fourth place, while a \$30 price cut on the MSI StarForce 831 elevates it from fourth to second, moving it past both the ELSA Gladiac 920 and the ATI All-in-Wonder Radeon in the process. ▶

| | AGP BOARD | Street price (7/10/01) | Overall rating | Image quality | Overall speed | Features rating | Comments |
|----|---|------------------------|----------------|---------------|---------------|-----------------|--|
| 1 | Best BUY CardExpert GeForce2 MX TwinView/Vivo Golden Sample find.pcworld.com/11423 NEW | \$159 | 91 | Very good | Good | Very good | FEATURES: 4X AGP, NVidia GeForce2 MX-400 chip, 32MB of SDRAM, 350-MHz RAMDAC; S-Video-in and -out, composite-in and -out. SUMMARY: Solid performance and strong graphics quality, with the ability to display separate images on a monitor and a TV simultaneously. ★★★★★ |
| 2 | Best BUY MSI StarForce 831 find.pcworld.com/10282 | \$139 | 89 | Good | Very good | Good | FEATURES: 4X AGP, NVidia GeForce2 Pro chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; DVD software; color-calibration, virtual desktop, and overclocking utilities. SUMMARY: The StarForce 831 almost matched GeForce3 cards in overall speed; a \$30 price cut helps. (★★★★★ Sept 01) |
| 3 | ATI All-in-Wonder Radeon find.pcworld.com/10140 | \$279 | 88 | Good | Good | Excellent | FEATURES: 4X AGP, ATI Radeon chip, 32MB of DDR SDRAM, 350-MHz RAMDAC; DVI-out, TV tuner, hardware DVD support; graphics-editing software. SUMMARY: This card falls from the top spot, but still makes a strong showing, thanks to its video features and bundled video-editing software. |
| 4 | CardExpert GeForce3 Power Pack find.pcworld.com/11301 NEW | \$369 | 88 | Very good | Excellent | Very good | FEATURES: 4X AGP, NVidia GeForce3 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-in and -out, composite-in and -out, Ulead Video Studio. SUMMARY: This CardExpert model is well priced for a GeForce3 card, and it delivered strong performance on all of our tests. ★★★★★ |
| 5 | Hercules 3D Prophet II MX find.pcworld.com/10283 | \$99 | 88 | Very good | Good | Good | FEATURES: 4X AGP, NVidia GeForce2 MX chip, 32MB of SDRAM, 350-MHz RAMDAC; color-calibration software, five game demos. SUMMARY: This reasonably priced board's above-average image quality and performance keep it on the chart, but it lacks the software bundle that other cards have. |
| 6 | AOpen MX400-A find.pcworld.com/11321 NEW | \$199 | 87 | Good | Good | Very good | FEATURES: 4X AGP, NVidia GeForce2 MX-400 chip, 64MB of SDRAM, 350-MHz RAMDAC; S-Video-in and -out, composite-in and -out, TV tuner, VideoStudio video-editing software. SUMMARY: Strong image quality and features, but a little more expensive than comparable cards. ★★★★★ |
| 7 | ELSA Gladiac 920 find.pcworld.com/10280 | \$399 | 87 | Excellent | Very good | Good | FEATURES: 4X AGP, NVidia GeForce3 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; DVD software, game. SUMMARY: Magnificent image quality earned the ELSA near-perfect image-quality scores. DirectX 8 hardware support will be a plus when DirectX 8 games arrive. (★★★★★ Sept 01) |
| 8 | Asus AGP-V7100 Deluxe Combo find.pcworld.com/10300 | \$149 | 87 | Good | Good | Very good | FEATURES: 4X AGP, NVidia GeForce2 MX chip, 32MB of SDRAM, 350-MHz RAMDAC; 3D glasses, AV adapter, S-Video-in and -out, TV tuner. SUMMARY: This board offers NVidia's TwinView for displaying separate images on a TV and on analog and digital monitors. |
| 9 | ATI Radeon 64MB DDR find.pcworld.com/10284 | \$229 | 85 | Good | Very good | Very good | FEATURES: 4X AGP, ATI Radeon chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; hardware DVD support, S-Video-out, composite-in and -out, graphics-editing software. SUMMARY: This Radeon provides solid performance at high resolutions, a generous helping of ports, and 64MB of DDR SDRAM. |
| 10 | MSI StarForce 826 MX400 find.pcworld.com/11302 NEW | \$95 | 84 | Good | Good | Good | FEATURES: 4X AGP, NVidia GeForce2 MX-400 chip, 64MB of SDRAM, 350-MHz RAMDAC; S-Video-out, DVD software. SUMMARY: Well priced, but it has a very limited software bundle. The output was rather dark and lacked contrast in several of the games used in our tests. ★★★★★ |

HOW WE TEST: We test graphics boards under Windows Millennium Edition. Our performance scores are based on tests that we evaluate on frame rate (50 percent) and image quality (50 percent). We use GT Interactive's Unreal Tournament, Id Software's Quake III Arena, Interplay's MDK2 Demo, Infogrames' Test Drive 6, and the Caligari TrueSpace 4.2 Benchmark for both performance and image-quality testing. We test graphics boards in a Dell Dimension 4100 Series with a PIII-933 CPU and 128MB of PC133 SDRAM. To test each board, we use drivers supplied by the vendor. Overall rating is based on performance (42.5 percent), features (27.5 percent), price (20 percent), and support policies (10 percent). See find.pcworld.com/10860 for details on PC World's Star Ratings.



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TOP 10 DIGITAL CAMERAS

Visit find.pcworld.com/11780 for reviews of all products ranked in this chart or tested this month.

A FINE PEDIGREE WILL TELL: Debuting in second place, Epson's PhotoPC 3100Z replaces the company's PhotoPC 3000Z, a longtime resident on our Top 10 list. With August's number one Nikon Coolpix 880 discontinued, the Coolpix 995 moves up to the top spot. The other two new models we

tested this month, the Casio QV-3500EX and the Sony DSC-S75, also made our Top 10. The Casio is the second 3-plus-megapixel camera to cost less than \$600—evidence that the 4-plus-megapixel models appearing on the near horizon are forcing prices down on lower-resolution models. ▶

| | CAMERA: \$500 AND OVER | Street price (7/6/01) | Overall rating | Image quality | Ease of use | Battery life/ shots | Comments |
|----|--|-----------------------|----------------|---------------|-------------|---------------------|---|
| 1 | Best BUY Nikon Coolpix 995 find.pcworld.com/10771 | \$899 | 85 | Very good | Adequate | Outstanding/ 363 | FEATURES: 3.34-megapixel resolution, 16MB CompactFlash media, 38mm-152mm focal range; USB and video output; 16.2 ounces. SUMMARY: Offers a huge, at times intimidating list of features. It captured some top-notch images, and its batteries lasted twice as long as those of the Coolpix 990. |
| 2 | Best BUY Epson PhotoPC 3100Z NEW find.pcworld.com/11422 | \$779 | 84 | Very good | Very good | Very good/ 229 | FEATURES: 3.34-megapixel resolution, 16MB CompactFlash media, 34mm-102mm focal range; USB and video output; 16.9 ounces. SUMMARY: An upgrade of the former Best Buy 3000Z, this new model adds an interpolated 2544 by 1904 resolution and a new print-tagging button. ★★★★★ |
| 3 | Olympus Camedia C-3040 Zoom find.pcworld.com/10772 | \$799 | 81 | Very good | Good | Adequate/ 147 | FEATURES: 3.34-megapixel resolution, 16MB SmartMedia card, 35mm-105mm focal range; serial, USB, and video output; 13.7 ounces. SUMMARY: Boxy but stylish; produces great shots; loads of control options, but too many of them are buried in menus; supports USB Storage Class standard. |
| 4 | Casio QV-3500EX NEW find.pcworld.com/11421 | \$599 | 81 | Very good | Adequate | Very good/ 223 | FEATURES: 3.3-megapixel resolution, 16MB CompactFlash media, 33mm-100mm focal range; serial, USB, and video output; 15.9 ounces. SUMMARY: Not especially easy to use, nor the most attractive, but it takes great shots and has a bargain price. Offers novel features for novices. ★★★½ |
| 5 | Fujifilm FinePix 6800 Zoom find.pcworld.com/10773 | \$899 | 80 | Very good | Adequate | Good/ 186 | FEATURES: 3.3-megapixel resolution, 16MB SmartMedia card, 36mm-108mm focal range; USB and video output; 10.3 ounces. SUMMARY: This small, Porsche-designed camera has futuristic styling and takes impressive pictures, but the menus are difficult to navigate. Can capture short movies. |
| 6 | Olympus Camedia E-10 find.pcworld.com/10777 | \$1799 | 79 | Good | Very good | Limited/ 69 | FEATURES: 4-megapixel resolution, 32MB SmartMedia card, 35mm-140mm focal range; USB and video output; 40.2 ounces. SUMMARY: \$200 price drop. Ultrahigh resolution, through-the-lens viewing, and extensive controls; also accepts CompactFlash media. It's heavy and remains pricey. |
| 7 | HP Photosmart 912 find.pcworld.com/10778 | \$599 | 78 | Good | Very good | Adequate/ 155 | FEATURES: 2.24-megapixel resolution, 16MB CompactFlash media, 34mm-107mm focal range; USB, IRDA, and video output; 21.6 ounces. SUMMARY: A \$200 price reduction propels the 912 up the chart. This model offers an SLR-like case, extensive and intuitive controls, and solid images. |
| 8 | Sony Cyber-shot DSC-P1 find.pcworld.com/10774 | \$699 | 78 | Good | Outstanding | Adequate/ 115 | FEATURES: 3.34-megapixel resolution, 8MB Memory Stick media, 39mm-117mm focal range; USB and video output; 8.8 ounces. SUMMARY: Innovative, pocket-size design; intuitive controls and easy-to-read menus; creates MPEG movie clips with sound; ideal for trendy snapshooters. |
| 9 | Sony Cyber-shot DSC-S75 NEW find.pcworld.com/11420 | \$699 | 78 | Good | Good | Very good/ 252 | FEATURES: 3.3-megapixel resolution, 8MB Memory Stick media, 34mm-102mm focal range; USB and video output; 15.7 ounces. SUMMARY: A step up from a point-and-shoot model, this solid camera takes fine photos. It offers a full set of controls, though they can be confusing. ★★★½ |
| 10 | Toshiba PDR-M65 find.pcworld.com/10776 | \$599 | 77 | Very good | Good | Very good/ 259 | FEATURES: 3.34-megapixel resolution, 8MB SmartMedia card, 38mm-114mm focal range; USB and video output; 14.3 ounces. SUMMARY: A simple camera with few fancy controls compared with other cameras that have the same resolution. Can capture sharp images, but doesn't reproduce color well. |

HOW WE TEST: Each camera's overall rating is based on price (30 percent), picture quality (20 percent), ease of use (15 percent), features (15 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better. To gauge picture quality, we take a series of shots, with and without flash, at 640 by 480 resolution and at the camera's highest resolution. We take pictures of a complex still life and of a mannequin to see how well each camera captures image details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores; we then average those scores. Camera weights include batteries. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings. 1 35mm film equivalent.

Taking Your Ideas to Their Limits

Continued from page 11

Outer space is the final frontier, but terrestrial spaces can be just as inhospitable without the right equipment. A new high-definition multimedia projector from Hitachi (www.hitachi.com/lcd) features a Liquid Crystal on Silicon (LCOS) panel structure that allows demanding presenters to project their ideas across spaces as compact as a home theater or as large as an auditorium.

Suitable and sensible wherever you need bright, sharp images, Hitachi's CP-SX5500W LCOS multimedia projector delivers 1500 lumens at SXGA (1365 x 1024) resolution for a vivid, color-rich image—at an XGA price point. The CP-SX5500W also features Hitachi's Motion Adaptive Progressive Scan technology that automatically reduces flicker by eliminating the misaligned pixels in fast streaming video frames.



HITACHI'S CP-SX5500W is the company's first projector to utilize LCOS technology.

Hitachi's innovations also include a precision noise reduction component plus a Black Level Enhancer (which digitally lowers an image's black levels while increasing contrast) to further ensure the highest video quality.

Other high-end features of this 12-pound portable include digital RGB (DVI), two RGB (analog), component, composite, and S-Video inputs for easy, no-fumbling, no-guesswork connectivity. The CP-SX5500W also features an easy-to-use direct key-stone adjustment button that quickly compensates for horizontal and vertical alignment corrections to simplify tabletop setup.

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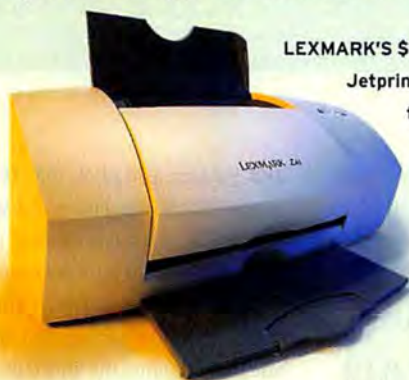
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the top of each chart (for example, find.pcworld.com/10600 for products on the *Top 10 Ink Jet Printers* chart). Next month's *Top 100* will cover CD-RW drives, 17-inch CRT monitors, ink jet printers, and sub-\$500 digital cameras. ■



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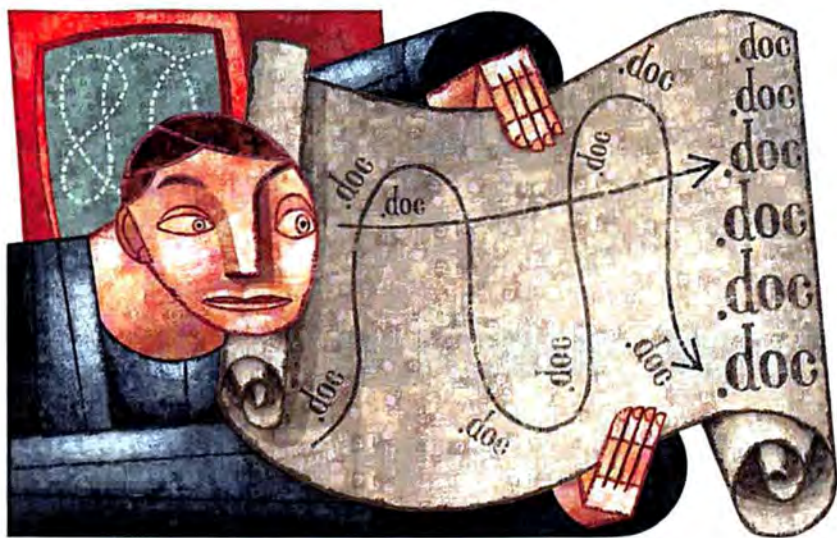
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HERE'S HOW

EDITED BY DENNIS O'REILLY



WINDOWS TIPS

SCOTT DUNN

A Better Start for Your Documents Menu

ALL Versions YOU GET FAST access to the files opened most recently when you select **Start•Documents**, but only the last 15 files you worked on are visible from this menu. Want to view more than 15? Fewer? Here are several of my favorite ways around this and other limitations of Windows' Documents menu.

The shortcuts displayed in the Documents menu are stored in a folder called (appropriately enough) 'Recent'. This

folder is probably in your Windows folder unless your system has several user profiles; if it does, the folder for your profile will likely be in 'C:\Windows\Profiles\your log-on name\Recent' or 'C:\Documents and Settings\your log-on name\Recent'. If you aren't able to see the folder in an Explorer window, choose either **View•Options**, **View•Folder Options**, or **Tools•Folder Options** (depending on your Windows version); click the **View** tab; select **Show All Files** or **Show Hidden Files**

and **Folders**; and click **OK**. If necessary, choose **Start•Find•Files or Folders** (or **Start•Search•For Files and Folders** in Windows Me), and look for a folder named 'Recent' on your start-up drive. If there's more than one folder named 'Recent', find the one that contains the shortcuts to the files you opened most recently.

Shortcuts to your shortcuts: Your Recent folder often contains far more shortcuts than are visible on the Documents menu. To view all of the documents in this folder, open it and resize it by dragging its edges (see **FIGURE 1**). The next time you open the folder, it will retain those dimensions. Now right-click and drag the folder icon to your Desktop folder, Start Menu folder, or StartUp folder (which is inside the Start menu's Programs folder). Select **Create Shortcut(s) Here** when you release the button. Note that any file shortcut you add to the Recent folder manually won't appear on the Start•Documents menu.

You can make Windows 2000 and Me display shortcuts to the folders you opened most recently as well as to your recently opened documents. Right-click an empty part of the taskbar and choose **Toolbars•New Toolbar**. In the New Toolbar dialog box, browse to and select the Recent folder that contains your file shortcuts. Click **OK** to create a toolbar that shows more—though not



FIGURE 1: KEEP THE Recent folder open on your desktop.

ILLUSTRATION: RICHARD DOWNS

190 WINDOWS TIPS

Put the right shortcuts—to files and folders—in your Documents menu; plus a word on Windows' built-in glossary.

194 INTERNET TIPS

Say bye-bye to browser pop-ups; get clearer, brighter AOL graphics; and view Shockwave animations offline.

196 STEP-BY-STEP

'Tis a gift to be simple on the Web, too. We walk you through creating a basic Web site, registering a domain name, and posting your pages. For more on Web site design, see "Easy Steps to a Great Site" on page 135.

198 HARDWARE TIPS

A new CPU may give that old PC of yours more oomph, but how much? Also, faster writing to removable disks.

200 ANSWER LINE

Keep people from using your PC without your knowledge and permission; put an image slide show on a CD-R.



FIGURE 2: RECENT WORK IS a click away when your Recent folder is a taskbar toolbar.

necessarily all—of the file and folder shortcuts in your Recent folder. If the toolbar takes up too much space on your taskbar, drag the handle near the toolbar name to shrink it until only the toolbar name and two greater-than symbols (>>) are showing. Click the greater-than symbols whenever you want to see a pop-up menu of recent items (see FIGURE 2). If you like, you can drag the entire toolbar to the desktop and create a floating toolbar. This arrangement lets you right-click the toolbar and choose *Always on Top* to keep your recent items a click away.

If you prefer a larger Documents menu but don't want it to appear on the taskbar or as a floating toolbar, you can make Windows 2000 and Windows Me store shortcuts to your recently opened files in a folder other than the default Recent folder. The simplest way to do this is with Tweak UI, a free Microsoft utility available at find.pcworld.com/11500 from the Downloads library at PCWorld.com.

First, you need to create the folder where you'll store your Recent documents' shortcuts. You will probably want this folder to be inside your Start Menu folder to make accessing the files easier. You can also make recent items pop up on the Links bar by creating a folder inside the Links folder, which is usually found inside the Favorites folder. (I will discuss the Links toolbar in greater detail in next month's *Windows Tips*.)

Next, open Control Panel, double-click the *Tweak UI* icon, and select *My Computer*. Under Special Folders, choose *Recent Documents* from the Folders dropdown list. Select *Change Location*, read the warning, and click *Yes*. In the Browse for Folder dialog box, find and select the new folder you created for your recent shortcuts. Click *OK* as many times as necessary. Now choose *Start+Log off*, click *Yes* when you're asked if you're sure you want to log off, and then log back on to make the change take effect. At first you might not see any shortcuts on your new menu (or in your new folder), but as you open and save files over time, the list will grow longer and become more useful.

Note: The two tips above work fine in Windows 9x, but you'll see more than 15 items at once only in Windows 2000 or Me.

A historical perspective: To see shortcuts to recently used files while working in any folder, Explorer, or Internet Explorer window, press <Ctrl>-H to open the History pane (also called the History 'Explorer Bar') on the left side of your screen. To see only the documents you opened that day, choose *View>By Date* inside the His-

tory pane (not the 'View' on the main menu bar at the top of the window under the folder name). Then click *Today* and choose *My Computer* (see FIGURE 3). To see a mixture of the documents you opened and the Web sites you visited today, choose *View>By Order Visited Today*. And to see all the documents opened on your computer in the last several days (excluding Web sites), choose *View>By Site* and click *My Computer* in the History list. (If you don't see 'My Computer' in the History pane, open a file in any application, and then close and reopen the History pane; 'My Computer' should become visible under 'Today'.)

This view lists the largest number of recent files—probably too many to be useful—but at least the files are alphabetized. Once you've clicked *My Computer* to acti-

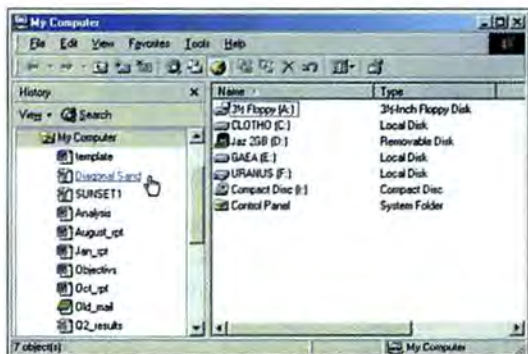


FIGURE 3: FIND FILES YOU USED on any given date by pressing <Ctrl>-H to open the History Explorer Bar.

vate the list, you can jump to an item simply by typing its first letter (type the letter repeatedly to move down the list of files that start with that letter one at a time).

Clicking a Microsoft Word (.doc), Excel (.xls), or other Office file opens it in the current folder or browser window rather than in the normal Office application ▶

window, but you'll still have access to the menus necessary for editing the file. Non-Office file types should open as expected.

See only your type of file: The Documents menu may show file types that you don't want to see. For example, you may not want the menu to list every graphic you download from the Web or every .zip file you open. Of course, you can right-click any item on the Documents menu and choose *Delete*, but you can also get rid of multiple files at once by making a shortcut that wipes out useless file types and leaves more room for the kinds of files you want to see. Right-click the empty area inside a folder or on the desktop, and choose *New*•*Shortcut*.

In the Create Shortcut wizard's first box, type a line such as `command.com /c del c:\windows\recent*zip*.lnk` (see FIGURE 4). Change the path above to match the location of your own Recent folder, and then replace 'zip' with the extension of the file type you want to filter out of the Docu-

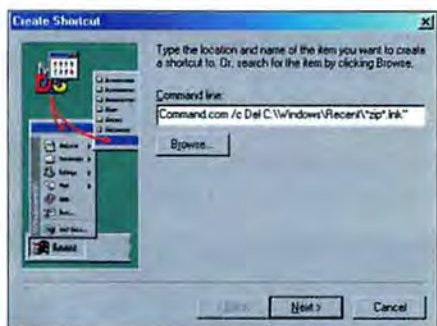


FIGURE 4: SELECTIVELY ZAP unwanted items from your Documents menu.

ments menu. In Windows 2000, change 'command.com' to `cmd.exe`. Select *Next*, give the shortcut a name, and click *Finish*.

Unfortunately, this trick works only when the extension of the file type you want to delete is revealed. Open any Explorer or folder window and choose *View*•*Folder Options* or *Tools*•*Folder Options*, depending on your version of Windows. Click the *File Types* tab and select the file type you intend to filter routinely. Then click *Edit* (in Windows 9x) or *Advanced* (in Windows 2000 or Me). Check *Always show extension*, click *OK*, and close the Folder Options dialog box. Now any time you want to remove that type of file

from your Documents menu, simply launch the shortcut you just created. To make Windows clear those files automatically every time you log in, place the shortcut in the Start Menu\Programs\Startup folder. You can also use the Task Scheduler or Scheduled Tasks folder to delete the items whenever you want.

Filter recent documents on the fly: You can filter your list of recent documents to show only one file type without deleting other file types, but this arrangement requires a bit more work than simply consulting a menu or toolbar. Most of the effort comes in the initial setup, however. Choose *Start*•*Find*•*Files or Folders* or *Start*•*Search*•*For Files and Folders*. In the first box, type `*.lnk`. In the 'Look in' box, type the path to your Recent folder. To specify the type of shortcut you want to see, select the 'Containing text' box. There, type the extension for the file type you're seeking—for example, `xls` for Excel files or `doc` for Word files—and press *<Enter>*. The window will show you only the shortcuts for the files you specified.

To simplify this process in the future, choose *File*•*Save Search*. In Windows 9x, the saved search automatically appears on the desktop, but you can move it. Store this and any other searches in a Start menu folder or other convenient location. The next time you want to filter your recent shortcuts, just launch the shortcut to the saved search and press *<Enter>* to update the results.

A TECH GLOSSARY IN WINDOWS

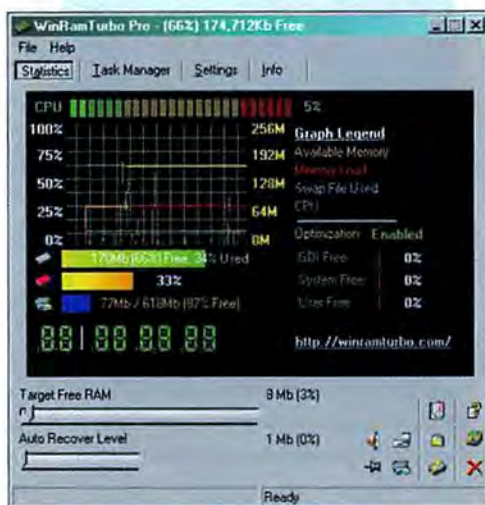


If you're occasionally befuddled by computer terminology, don't overlook a valuable resource: Windows' built-in glossary. In Windows NT 4 and 2000, choose *Start*•*Help*, click the *Contents* tab, and select *Glossary*. In Windows 98, click *Start*•*Run*, type `getstart.chm`, and press *<Enter>*. In some cases, you may have to type the entire path: `c:\windows\help\getstart.chm` (your path may differ). Click the *Contents* tab and choose *Glossary*. In Windows Me and XP, select *Start*•*Help* or *Help and Support*, type `glossary` in the Search box, and

WINDOWS TOOLBOX

Optimize Your PC With WinRamTurbo

DO YOU WANT to know more about what's happening behind the scenes in Windows? Would you like to improve the operating system's performance? WinRamTurbo can help. The utility boosts Windows' performance by defragmenting and optimizing memory, and by optimizing your file and disk caches (they contain the RAM used to speed up access to the hard disk). The



program also reduces the incidence of Windows' loathsome blue screens of death. WinRamTurbo's many features are well documented, and the utility's control panel is relatively straightforward. All intermediate and power Windows users will want WinRamTurbo in their tool kit. It's available in a free version, an \$8 Lite version, and a \$20 Pro version. Visit find.pcworld.com/11860 to get the free version.

click *Go* or the green arrow. Now select *Glossary of Windows terms*, *Glossary*, or *Windows Glossary* on the left side of the window. Once you've got the glossary in front of you, just choose a word or section of the alphabet and browse away. ■

Windows Tips pays \$50 for published tips and questions. Scott Dunn is a contributing editor for PC World.



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INTERNET TIPS

SCOTT SPANBAUER

ONE QUICK CLICK TO
BETTER AOL IMAGES

SHOCKWAVE: CAPTURE
NOW, VIEW LATER

Send Browser Pop-Ups to Their Deserved Demise

I KNOW HOW MANY browser windows I want open at any particular time, and it's usually just one. So it drives me nuts when sites use their Web programming wiles to open extra browser windows on my screen automatically. Like banner ads, the windows usually hawk junk I don't want. But I can't just ignore pop-ups. To get back to my original window, I have to switch away from or close the additional windows. And with so many new windows open, it's easy to close the wrong one and lose my surfing momentum.

The quick solution is to press **<Ctrl>-W** to close the uninvited browser window (repeat as necessary) and avoid visiting the impertinent site again. But many useful sites are loaded with pop-ups. The windows may open when you enter the site, shortly thereafter, or as you leave the site. In any case, it's a hassle.

Since most pop-ups are created in JavaScript, you can prevent the popping by turning off your browser's JavaScript support. In Netscape Navigator 4.7x, choose **Edit•Preferences**, select **Advanced** in the Category tree, remove the check mark

from **Enable JavaScript** in the displayed options, and click **OK**. In Internet Explorer 5.x, choose **Tools•Internet Options**, click the **Security** tab, select the **Internet** zone, and click the **Custom Level** button. Scroll through the Settings window until you reach **Active Scripting**; set the option to **Disable or Prompt**, and click **OK**. If you use America Online 6's browser, choose **Settings•Preferences•(Internet Properties) WWW**, click the **Security** tab, select the **Internet** zone, and follow the same steps described for Internet Explorer above.

Once you disable JavaScript, Web sites that use it for navigation controls or personalization won't display or function as intended. If that causes problems for you, reenable JavaScript and then download and install one of the many freeware and shareware utilities for taming pop-ups.

FIGURE 1 lists some of these.

DE-FUZZ AOL GRAPHICS

EVER WONDER WHY Web images viewed on America Online look blurrier or more distorted than they do over other Internet connections? To help pages load quickly

over the modem connections most of its customers use, AOL automatically compresses standard .bmp, .gif, and .jpg images and converts them to the more compact Johnson-Grace format.

The loss in quality (compared with uncompressed images) is subtle but noticeable. Fortunately, however, you can turn off this default compression setting: Choose **My AOL•Settings•Preferences•(Internet Properties) WWW**, select the **Web Graphics** tab, click the **Never compress graphics** option, and then click **OK** (see FIGURE 2). To see the results of the change, you must first clear the browser's cache of compressed files: Select the **General** tab and click the **Delete Files** button.

CAPTURE SHOCKWAVE FILE

WANT TO CAPTURE a Shockwave animation for offline viewing? It's easy to accomplish this task because the Shockwave file runs from your hard disk. After

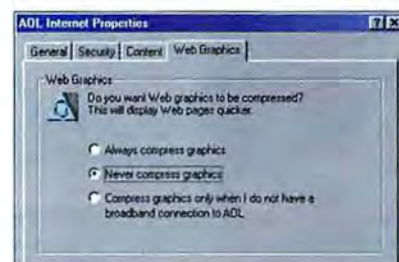


FIGURE 2: CLEAR UP AOL'S graphics by telling the browser not to compress images.

browsing to the site containing the Shockwave animation (Flash) that you'd like to capture, choose **Start•Find•Files or Folders** (**Start•Search•For Files or Folders** in Windows Me and 2000) and enter ***.swf** as your search criterion. The file should appear in your browser's cache. You'll probably have to open several of the found files to figure out which one you want. Then either copy and paste or drag it into the folder of your choice. As long as the .swf file type is associated with your browser, you can play the animation simply by double-clicking it. ■

Send your questions and tips to nettips@spanbauer.com. We pay \$50 for published items. Scott Spanbauer is a contributing editor for PC World.

THE POOP ON POP-UP WINDOW CLEANERS

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| Surf+ | 250KB | IE 4 or later | Free | www.filemix.net/surfplus |
| XenoBar | 165KB | IE 5.5 or later | \$15 | www.s-studio.net/xenobar |

FIGURE 1: BANISH BROWSER POP-UPS by using one of these free or low-cost utilities.

Wow!

[this is the sound coming out of
your mouth after you find out your
friend designed his web pages
faster, easier and cheaper because
he went to **ulead.com** first]



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STAN MIASTKOWSKI

Build Your First Web Site

SOMETIMES, simplicity is good, especially when you're building your first Web page. Apart from being easier to design, a basic page loads quickly in any browser. Here we show you how to build a simple page. When you're ready to take the next step, turn to "Easy Steps to a Great Site" on page 135 for tips on designing your site and adding interactive elements like rollovers, shopping carts, and polls.

HTML (Hypertext Markup Language) is the language of the Web, the code that governs every Web site. But while learning HTML is valuable for getting under the hood, using a basic WYSIWYG (What You See Is What You Get) HTML editor

is a far easier way to create a simple Web site. You enter text just as you would with a word processor, drop in images, and add links—the software creates all the HTML automatically in the background.

Web editors are available in all levels of complexity, and they can be expensive. But a basic WYSIWYG editor like Microsoft FrontPage Express or Netscape Composer is all you need to get off the ground. And you may already have one on your PC. If you use Windows 98 and Microsoft Internet Explorer 5 or later, FrontPage Express may be preinstalled; Netscape users probably have a version of Composer.

In the example outlined here, we used

WHAT YOU'LL NEED

A Web page editor like Microsoft FrontPage or Netscape Composer

A host for your Web site (steps 1 and 8)

A basic FTP client (step 7)

just a few of FrontPage Express's features to create a custom page for our basic Step-by-Step Web site (www.pcwstepbystep.com). The directions are quite similar for WYSIWYG editors like Composer. To learn more about HTML, just go to any search engine and enter **HTML tutorial**. Or invest in a book on page design fundamentals such as *Learning Web Design* by Jennifer Niederst (O'Reilly, 2001).

Once you've learned the basics, you can use a full-fledged Web design tool (such as FrontPage 2001 or one of its competitors) to jazz up your site. See "Your Web Toolbox" on page 140 for some of our favorites. But please, keep it simple. ■

Stan Miestkowski is a contributing editor for PC World.

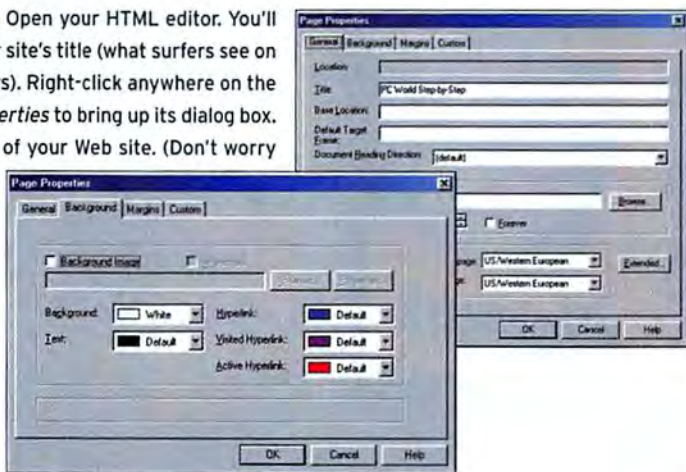
EIGHT STEPS TO CREATING A BASIC WEB PAGE

1 Plan out your site and get a host. Before you sit down at your PC, design your site on paper. Make a list of the elements—site name, headings, data, graphics, links, and so on—that you want on your site.

You'll also need a host for your Web site. Most Internet service providers make limited space for a Web page available to every registered user (contact your ISP for details). Or you can opt for one of the many free Web hosts such as GeoCities.

2 Start with the basics. Open your HTML editor. You'll first want to enter your site's title (what surfers see on the top line of their browsers). Right-click anywhere on the page and choose *Page Properties* to bring up its dialog box. Under Title, type the name of your Web site. (Don't worry about any of the other entries on the screen.)

Then select the *Background* tab and (if you desire) choose a background image, background and text colors, and the colors for various types of hyperlinks. (For our example, we used the default settings.)



3 Enter your text and headlines. Entering text into your Web page is just like using a word processor. Once the text is entered, you can select it and choose its typeface and point size with the Font and Font Size drop-down boxes on the Formatting toolbar. Just as in Word, the Formatting toolbar lets you set the selected text's style (bold, underline, italic, or a combination), alignment (centered or left- or right-justified), color, and so on.

Web pages have levels of headings. To select a level, right-click a line of text, choose *Paragraph Properties*, and then pick the heading level you want.

Everything you ever wanted to know about upgrading your PC, from Stan Miestkowski of PC World and author of the monthly *Step-by-Step* column.

A Year of Upgrade Guides

| Month | Upgrade Guide |
|---------------|---------------------------------------|
| July 2001 | Edit Digital Video on Your PC |
| June 2001 | Install a Bigger, Faster Hard Drive |
| May 2001 | Revamp Your PC's Sound |
| April 2001 | Install a DVD-ROM Drive |
| March 2001 | Soup Up Your PC's Processor |
| February 2001 | Upgrade to Windows Millennium Edition |
| January 2001 | The Motherboard of All Upgrades |

4 Add graphics. Images add interest to your Web site. In general, images in .gif format are used for logos, cartoons, and similar graphics that have sharp lines and large areas of solid colors. JPEG images are used for photographs and detailed pictures.

To add an image to your Web page, place the cursor at the point in the document where you want the image to appear, select *Insert>Image*, enter the path to the image file (you can use *Browse* to find it), and select *OK*.

To change the image's position, drag it to a new spot. To wrap text around the image, use the alignment function of the Image Properties dialog box: Right-click the image and select *Image Properties*, select the *Appearance* tab, and choose an alignment option. You can adjust the space around the image with the *Border*, 'Horizontal spacing', and 'Vertical spacing' options.

5 Use tables to organize information. Tables allow you to present lists of information in a well-organized, formatted way. We used one to present links to a year's worth of *PC World's Upgrade Guide*.

To create a table, select *Table>Insert*, enter the number of rows and columns you want, and click *OK*. (You can ignore the other fields.)

A Year of Upgrade Guides

| | |
|----------------|-------------------------------------|
| July 2001 | Edit Digital Video on Your PC |
| June 2001 | Install a Bigger, Faster Hard Drive |
| May 2001 | Revamp Your PC's Sound System |
| April 2001 | Install a DVD-ROM Drive |
| March 2001 | Soup Up Your PC's Processor |
| February 2001 | Upgrade to Windows Me |
| January 2001 | The Motherboard of All Upgrades |
| December 2000 | Networking PCs Made Easy |
| November 2000 | Manage Your Drive Connections |
| October 2000 | Install RAM Modules |
| September 2000 | Build Your Dream Machine |
| August 2000 | Common Notebook Upgrades |

Then enter information or images into the cells of the table. You can use the font attribute tools to change the font style and size.

7 Load your Web site onto your host. You'll need a File Transfer Protocol utility to transfer your Web site to your host. You can find a number of shareware choices on PCWorld.com's Downloads page (www.pcworld.com/downloads). For our example site, we used WS_FTP Pro, a popular shareware utility with a modest price of \$40.

To upload your site, you'll need the following information (provided by your host):

- Host name
- Log-in name and password
- Directory for your Web pages

Once you've connected to your host and moved to the correct directory, it's time to upload your index.html file (the procedure depends on your FTP utility), plus any graphic images. Disconnect from the Web site, close your FTP utility, open your browser, and do a final check to make sure your site looks right. If everything works correctly, you're open for business.



6 Link it up. Links to external Web sites and to other parts of your Web site (assuming it has multiple pages) make your site's design truly useful. You can also add links that start e-mail messages to specific addresses.

To add a link to text, highlight it and click the *Hyperlink* icon on FrontPage Express's standard toolbar. Type the complete URL (including http://) and click *OK*. The link will appear in color and underlined on your Web page.

Continue until you've entered all the links.

To add an e-mail link, highlight the text that will contain the link, click the *Hyperlink* icon, select *Hyperlink Type>mailto*, and then enter the e-mail address directly after the 'mailto' entry. Click *OK*.

When you're done, save your Web page. Most hosts require that your site's start page (the page that appears at the URL <http://www.yoursitename.com>) be saved with the file name index.html. Others use default.html.



8 Stake your domain name claim. Though Web hosting space provided by your ISP is fine, the URL to access it can be long. And of course, it's not as sexy as having your own domain name. If you want to go that route, you'll first have to check whether the name of your dreams is available. Many Internet service providers register domain names and have a page where you can find out whether you can get the name you



want. Or check Network Solutions (www.networksolutions.com) or Register.com (www.register.com). But have a list of alternative name choices handy—chances are your favorite is already taken. Basic registration for a domain name costs \$35 a year.

Hosting charges for a custom domain start at about \$10 per month. Numerous companies offer hosting for a basic Web site, but many local and national ISPs offer all-in-one services that both register your domain name and provide hosting services, starting at about \$15 per month.

HARDWARE TIPS

KIRK STEERS

THE INS AND OUTS
OF CPU UPGRADESMATCH UP YOUR
MOTHERBOARDFASTER WRITING TO
REMOVABLE DISKS

Will a New CPU Give Your PC More Vroom?

IF YOU THINK you can feed your need for PC speed without investing in a whole new system, simply by replacing your old CPU with a newer and faster one, you're right—probably. A CPU upgrade can be a cost-effective way to boost PC performance, but it's not for everyone. Any prospective upgrader should ask two questions: How much performance will a new processor add to my PC? And is the bounce worth the cost?

You can find a CPU upgrade for almost any PC—from systems based on Intel's ancient 80486 chip through today's Pentium III models. But don't expect miracles from a new CPU if its clock speed is only slightly higher than that of your current CPU. A new processor running at twice the clock speed you're used to won't come close to doubling your system's performance. A 10 to 20 percent jump in performance is more realistic.

MORE ZIP FOR YOUR ZIP

IF YOU FREQUENTLY use a removable storage drive—such as an Iomega Zip or Jaz drive—you can speed up data writing to the drive by enabling write-behind caching. This arrangement allows Windows to temporarily store data destined for the disk in RAM and then write it to the disk when no other tasks are being performed. To enable this option, launch Control Panel's *System* applet, select *Performance•File System•Removable Disk*, and check the *Enable write-behind caching on all removable disk drives* box.

That's because other components play a big role in determining your system's overall performance. For example, dwindling hard disk space or too little RAM can slow down a system that's trying to process big spreadsheets or databases. And adding a topflight graphics card to your PC can dramatically improve the look and play of many games.

But if you're on a tight budget and you need a moderate, across-the-board performance boost, adding a new CPU can be worthwhile. Our rule of thumb: If you're staying in the same processor class, buy a CPU upgrade only if it will at least double your current clock speed—from 400 MHz to 800 MHz, for example. Better yet, move up an entire CPU class, such as from a Celeron chip to a full-fledged Pentium II or Pentium III.

If you have an older system, keep in mind that powerful new PCs are cheaper than ever. If a CPU upgrade costs more than \$300, you may be better off spending a little more for a new PC.

Here's what you need to know about your PC before you buy a new CPU:

What's your old CPU's name? Use Intel's Processor Frequency ID Utility to identify the company's CPUs. Go to find.pcworld.com/11880 to download the program.

What's your PC's chip set? The chip set your motherboard uses determines what types of CPU, RAM, hard drive, and other hardware will work with your PC. To discover what chip set your PC uses, look in your system's manual or download and run a hardware diagnostic program such

as the HWInfo shareware package. Visit find.pcworld.com/11881 to get it.

Does it use a socket or a slot? The type of CPU connector your motherboard uses determines which CPUs can connect to your system. **FIGURE 1** lists information to help you determine what your PC uses.

What about your frontside bus and multipliers? The frontside bus (or FSB) is the path between your RAM and CPU. It runs at a particular frequency: 66, 100, or 133 MHz. The motherboard multiplies that frequency to drive the CPU. For example, a Pentium II-233 CPU typically runs on a motherboard with a 66-MHz FSB and a multiplier of 3.5. The same system can run a Pentium II-266 CPU if you change the multiplier from 3.5 to 4. But running a Pentium II-400 CPU on that system would be a waste: With an FSB of

WHAT'S YOUR SOCKET?

| CPU | Motherboard attachment |
|-----------------------------|-----------------------------|
| Pentium (75 to 133 MHz) | Socket 5 or 7 |
| Pentium (133 to 200 MHz) | Socket 7 |
| Pentium MMX | Socket 7 |
| Pentium Pro | Socket 8 |
| Pentium II | Slot 1 |
| Pentium III | Slot 1 or Socket 370 |
| Celeron (300 to 433 MHz) | Slot 1 or Socket 370 |
| Celeron (466 MHz or faster) | Socket 370 (PPGA or FC-PGA) |
| K5 | Socket 5 or 7 |
| K6, K6-2, K6-III | Socket 7 or Super 7 |
| Athlon | Slot A |
| Athlon (Thunderbird) | Socket A |
| Duron | Socket A |

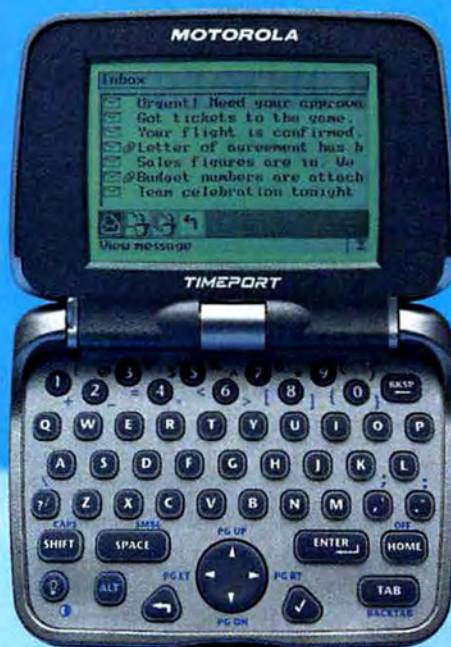
FIGURE 1: KNOW YOUR motherboard attachment type before you buy a CPU upgrade.

66 MHz and a top multiplier of 4, the old machine can run no faster than 266 MHz.

What is the voltage? If you're adding a standard CPU rather than an upgrade processor, make sure your motherboard's CPU voltage matches the voltage needs of your new CPU. Some motherboards support multiple CPU voltage settings, but many older boards don't. Check your manual to be sure of what you need. ■

Kirk Steers is a PC World contributing editor. Hardware Tips welcomes your tips and questions and pays \$50 for published items.

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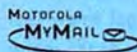
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ANSWER LINE

LINCOLN SPECTOR

PUT A SLIDE SHOW
ON A CD-R DISCMORE UTILITIES
MISSING IN MEPRINT A LIST OF
FOLDER SIZESHow Do I Keep Others
From Using My PC?

? HOW DO I MAKE my computer secure? Password-protecting Windows doesn't do much—all someone has to do to get on my PC is press <Esc>.

Muhammad Hadiaziam Mamat
Dungun Terengganu, Malaysia

WINDOWS' LOG-ON password doesn't actually secure your system, although in Windows 2000 it can secure files and folders. In other versions of Windows, it merely prevents people from logging on with your name. This is useful in business environments because it prevents a coworker from masquerading as you over a network, for example. But otherwise it's really not much different from having no system security at all.

To keep people off your system entirely, you need a boot-up password. Most PCs let you create one through their setup menu. Setup varies from one computer to another, so I can't give you exact instructions. Typically, pressing <Delete> soon after you turn on the computer—before it starts loading Windows—brings up the setup menu. If <Delete> doesn't work, try <Insert> or <Esc>. Then search the various submenus of the setup menu until you find the password options.

Boot-up passwords aren't perfect, however. Someone could still get on your

computer while you're logged on but away from your desk. To protect against this, password-protect either your screen saver or your system's standby mode. If you use a screen saver, right-click the desktop, select *Properties*, and click the *Screen Saver* tab. Check *Password protected* and click *OK*. For standby or hibernate

mode, right-click the desktop, select *Properties*, click the *Screen Saver* tab, and choose the *Settings* button in the Energy Star box. In the Power Options Properties dialog box, click the *Advanced* tab and then check *Prompt for password when computer goes off standby or hibernate*.

Now whenever your PC awakens from the screen saver or from

standby or hibernate mode, you'll have to re-enter your Windows password.

You can also encrypt files or folders. I've discussed this before, most recently last October in "Password-Protect Folders" (find.pcworld.com/10381) and last February in "Free Folder Encryption" (find.pcworld.com/10382).

PC Guardian's Encryption Plus Folders is a very good file-and-folder encryption program, the freeware version of which you can download at find.pcworld.com/11820 or directly from the vendor at www.pcguardian.com. The \$50 retail version



has a few tricks that you won't find in the free one, such as 192-bit Blowfish encryption (the free version offers only 64-bit) and the ability to encrypt the subfolders of an encrypted folder.

Finally, let's look at that Windows 2000 exception. To encrypt a file or folder on a drive in the NT File System format, right-click it and select *Properties*. Click the *Advanced* button on the General tab (yes, it should be on the Security tab). Then check *Encrypt contents to secure data*, click *OK* twice, and answer any resulting questions. Items that you encrypt will be accessible only when you type in your password at the Windows log-on screen.

THE BEST WAY TO UNINSTALL

? IS IT PREFERABLE to uninstall a program by using Windows' Add/Remove Programs utility in Control Panel or by using the uninstall program that came with the application itself?

Spencer Epply, Elkins, West Virginia

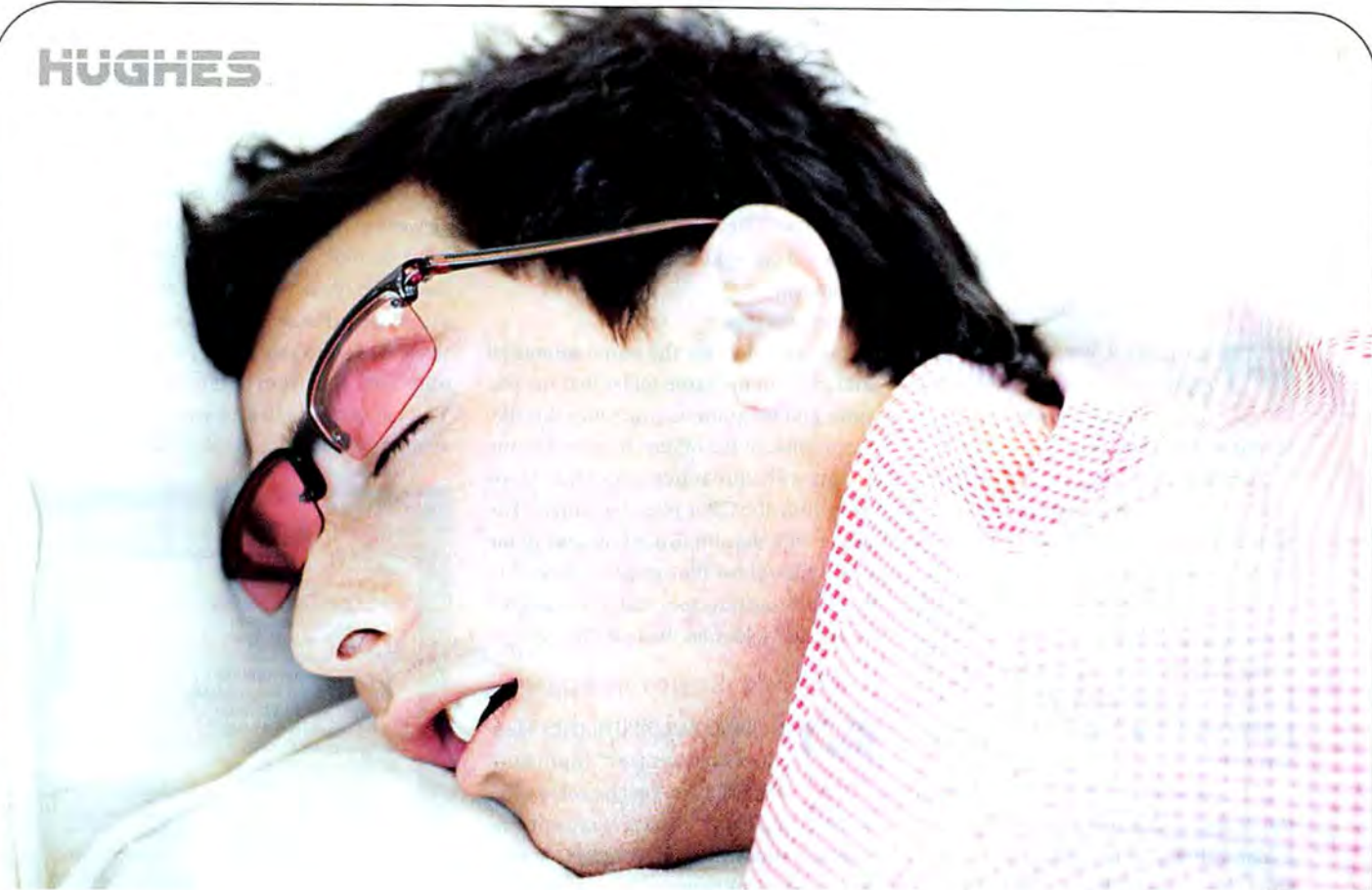
IT DOESN'T MAKE any difference. Control Panel's Add/Remove Programs applet simply launches the uninstall routine that came with the program. If the program has an uninstall option in the Start menu, it will run the same process as Add/Remove Programs.

One problem with Add/Remove Programs is that it often lists programs you've already uninstalled. To clean it, use Tweak UI, Microsoft's free Windows

WORD TEMPLATES
ON THE START MENU

DO YOU USE different Microsoft Word templates for different types of documents—say, one for letters and another for reports? If you do, and if you use Windows Me or 2000, you can launch your templates from your Start menu. In Windows Explorer, go to the folder holding your templates (probably C:\Windows\Application Data\Microsoft\Templates). Then drag the Templates folder itself to your Start button. You'll get a new Templates submenu off the Start menu. Select any option in this submenu, and Word will launch a blank document with the template's formatting.

HUGHES



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enhancement. Go to find.pcworld.com/11821 for the download. Once you've installed Tweak UI, load it from Control Panel and click the *Add/Remove* tab to clean up your list of installed programs.

EASY CD-R SLIDE SHOWS

? IS THERE A WAY to put together my digital photos as a slide show that I can distribute on CD-R discs to friends and relatives?

Charles G. Landis Jr., Yoe, Pennsylvania
YOU NEED A program that you can freely distribute without violating any licensing agreements, and that your friends and relatives can easily run. I suggest Lars P. Jeppesen's LPJ-Slideshow, which has the added benefit of being free for noncommercial use. Download LPJ-Slideshow at find.pcworld.com/11822 or from Jeppesen's site at hjem.get2net.dk/lpj.

LPJ-Slideshow is simple to use: Just put the program files and photos in the same folder. Launch the program, and you get a slide show (see **FIGURE 1**). One of the program files, *SlideShow.ini*, allows you to configure your presentation. You can, for instance, change the slide display order—it's all documented in the file. When people view the slide show, an on-screen menu tells them how to control it.

Start by setting up a folder on your hard drive. Put the Slideshow program files and your pictures into this folder, and launch *SlideShow.exe* to preview your show. You can copy the folder and its contents to a CD-R disc when you're satisfied.



FIGURE 1: THE LPJ-SLIDESHOW program puts an image slide show on a CD-R disc.

To make LPJ-Slideshow launch automatically when users put the CD into their drive, you need to create a very small file. Open a new file in Notepad or any other text editor and enter these two lines:

```
[autorun]
open=slideshow
```

Save the file with the name **autorun.inf** and put it in the same folder that the pictures and program occupy. Once this file, along with all the others, is moved to the CD, it will autolaunch your slide show every time the CD is placed in a drive. The folder with the *autorun.inf* file and all the other slide-show files must be located in the CD's root directory, not in a subfolder of another folder on the root directory.

MORE TOOLS NOT IN WIN ME

? IN "WINDOWS 98 UTILITIES Missing in Windows Me?" (April 2001 *Answer Line*, find.pcworld.com/10390), you didn't discuss Microsoft Fax. Unlike previous versions, Windows Me does not include a fax program. What happened?

Harvey Nice, Lake Forest, Illinois
I KEEP DISCOVERING additional Windows 9x utilities that Microsoft left out of Windows Me. While excising Fax from Me, Microsoft also removed the Backup and QuickView utilities from the new OS.

Microsoft's simple, no-nonsense Fax program was an integral part of Windows 95. The company hid it on the Windows 98 CD-ROM (see "Where's Microsoft Fax?" in the January 2000 *Answer Line*, find.pcworld.com/10392), made it visible again in Windows 2000, and removed it entirely from Windows Me. In fact, the old Microsoft Fax won't work in Windows Me—"by design," according to Microsoft. An alternative is RKS Software's \$20 Mighty Fax shareware program (available at find.pcworld.com/11823 and from the vendor at www.rkssoftware.com), which receives and sends faxes from any Windows program you can print from.

The retail and upgrade versions of Windows Me have Microsoft Backup on the CD-ROM. Open the CD-ROM's Add-ons\Msbackup folder and double-click the file *Msbackup.exe* to install it. Note, however, that the backup program that came with your tape, CD-R, or Zip drive is almost

certainly better than Microsoft Backup.

Windows 9x's QuickView won't work at all with Windows Me. An alternative file viewer is Ontrack's \$20 PowerDesk Pro. Visit find.pcworld.com/11825 for the download. PowerDesk Pro's file viewers are more extensive and more versatile than those in QuickView, but you can only view files from within PowerDesk. You can't right-click to view an e-mail attachment or, say, a file on your desktop.



FIGURE 2: FIND OUT HOW much space each folder takes with Folder Size Shell Extension.

PRINT EACH FOLDER'S SIZE

? HOW CAN I PRINT a listing of my hard drive's folders that shows the size of each one—including each folder's files and subfolders?

John Murphy, Tewksbury, Massachusetts
WINDOWS DOESN'T provide this capability, so try Berger Laurent's free Folder Size Shell Extension. Go to find.pcworld.com/11824 for the download. Folder Size Shell Extension adds a Size tab to your folder- and drive-property dialog boxes. Right-click the drive, select *Properties*, and click the *Size* tab to see the information you need. Choose the *Options* button and select *Save in a File* (see **FIGURE 2**) to save the data in a text file. Open the file in any program that can print it. ■

Send your questions to answer@pcworld.com. Answer Line pays \$50 for published items. You can find Contributing Editor Lincoln Spector's humorous writing at www.thelinkinspector.com.



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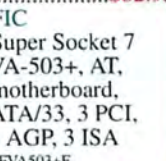
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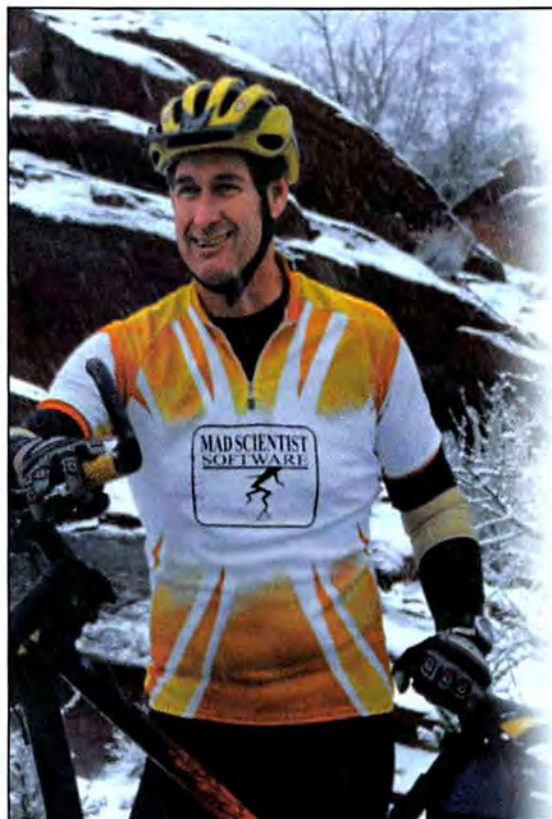
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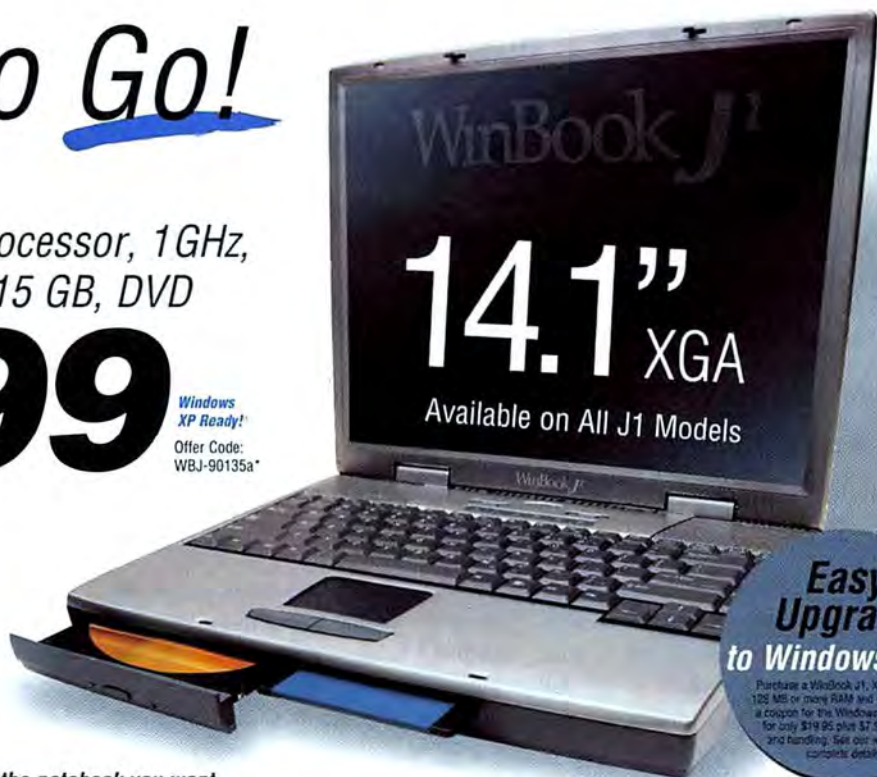
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PC Traffic Report: Beware of Bottlenecks

COMPUTING CIRCA 2001 resembles the highway system in major American cities. Now that the basic infrastructure is mature, we're forced to contend with intractable bottlenecks. The digital equivalents of rapid transit systems and wider roadways rarely seem to make things better.

Thanks to the magic of electronics, the basic performance of new hardware continues to improve by leaps and bounds. Yet speed bumps and choke points still keep our muscular machines from delivering everything they promise.

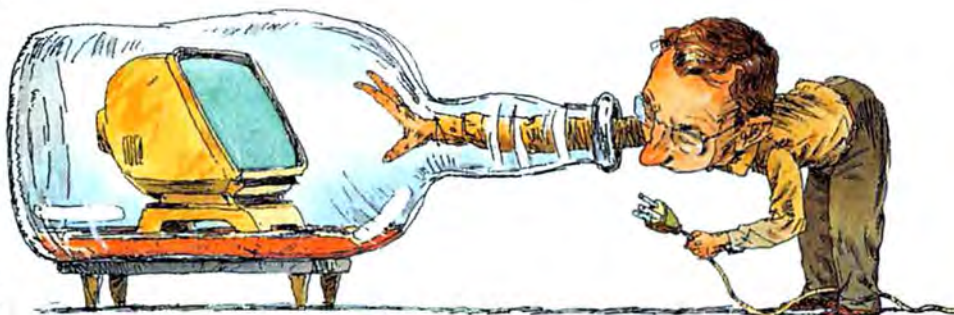
Need proof? Just flip back to our *Top 100* rankings. Double the clock speed of a processor, and you don't come close to doubling the speed of the machine. Internal bottlenecks—a bus, memory, and hard drive much slower than the chip, and even arcane features of the CPU itself—stand in the way. No wonder graphics cards do much of their own processing and have their own bus and memory. They're offloading work from a system not really up to the challenge of real-time 3D rendering.

In the Net world, some bottlenecks are not entirely obvious. Even if you pay for megabit-per-second speed via cable or DSL, you'll rarely get it: Overwhelmed servers and connections at the other end of the line often can't keep up. And even a megabit per second is far short of what's needed for broadcast-quality TV.

Untether your machine for portability, and you're confronted with new roadblocks. Battery life is the most obvious problem: Chemistry simply doesn't advance as quickly as microelectronics. And a laptop or cell phone becomes as functional as a brick when the juice cuts out 10 minutes past lunchtime.

As devices shrink, input and output systems tend to slow things down. A phone keypad is hardly the best way to type messages; a palmtop's tiny screen can't deliver much information. Current solutions

Technology's full potential often lies just out of our grasp.



to the input problem include voice recognition, the Graffiti system on Palm organizers, the thumb-typing keyboards on RIM Blackberry pagers, and the excellent Stowaway folding keyboard. The output bottleneck is tougher to address: Voice portals like Tellme are useful only for snippets of info, because we can't listen as fast as we read. Maybe cell phones will come with folding screens someday.

Software may well be the biggest bottleneck of all. How many times have you waited for your high-powered machine to

obey your command to do something as simple as switching from one program to another? Developers of operating systems have not yet figured out that the user's demands need to take priority: When you need to do something, other processes should meekly retire to the background.

But that's far from the only place software slows us down. I'm tired of waiting for HTML mail to open in a preview pane before I can move to the next message. I hate having to pause while a Web page loads fully before its links become functional. Outside the gaming world, software developers rarely seem to worry about speed or responsiveness. They fig-

ure that if you care about speed you'll just run out and buy a faster machine.

And since sluggish software can bring even the fastest hardware to its knees, I suspect that we'll see an end to computing congestion about the time I can drive 65 miles per hour on the freeway during the Friday evening rush. ■

PC World Contributing Editor Stephen Manes was a cohost of Digital Duo, a public television series. He has been writing about PCs for nearly two decades.



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