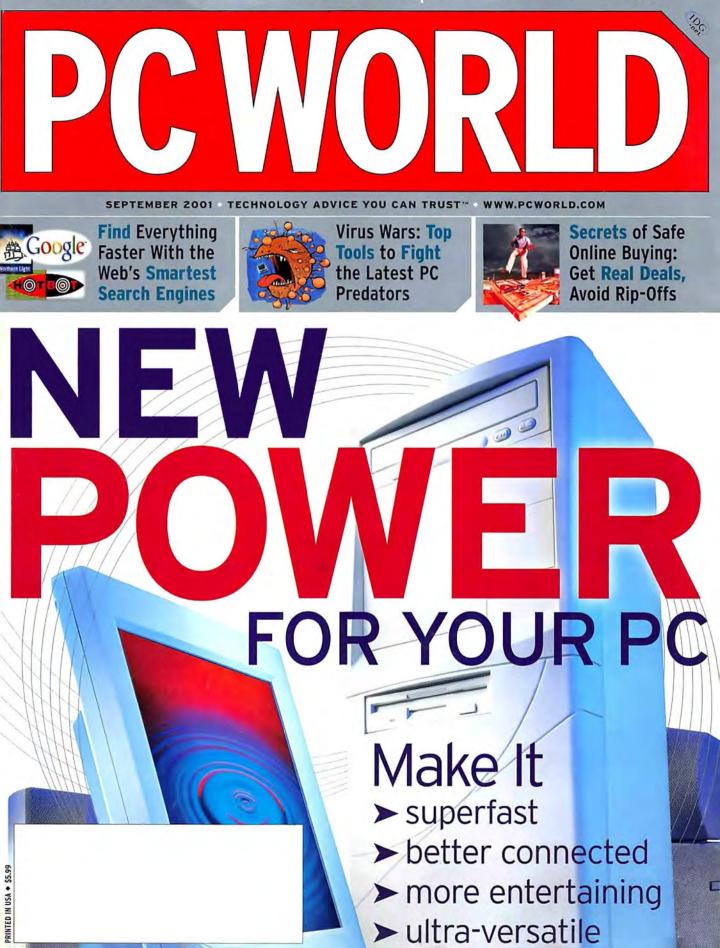
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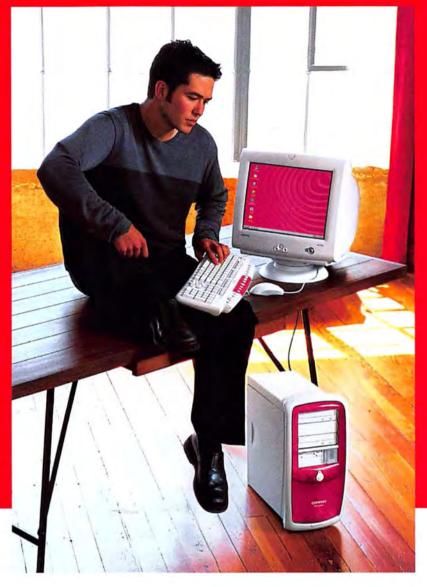


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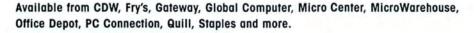


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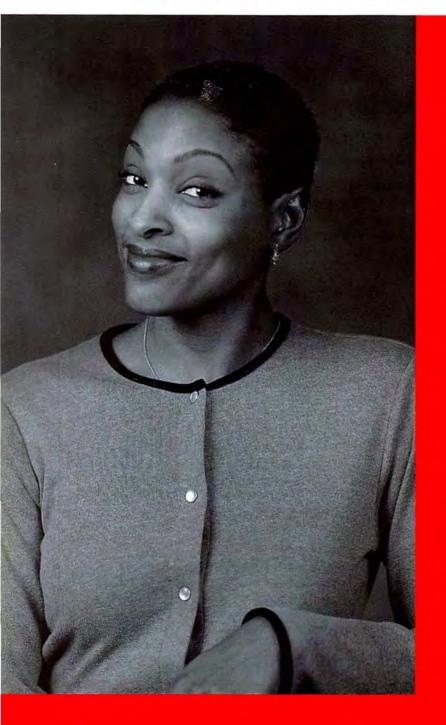
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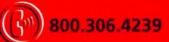
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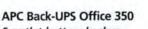
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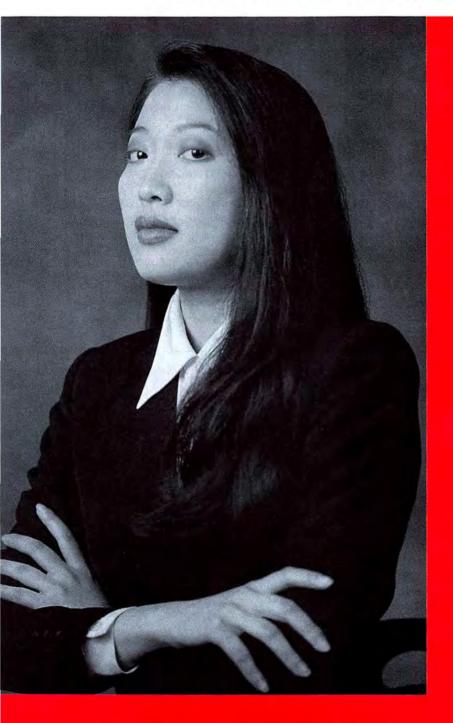




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# Bringing PC World Into Sharper Focus

IN THE MAGAZINE WORLD, a redesign is often a sign of weakness a last-ditch effort to turn a failing publication into something it's not. Redesigning a successful magazine like *PC World* presents a tougher challenge. Just ask Creative Director Robert Kanes, who recently com-

pleted his second redesign in 12 years.

The first revamp came back in 1996. That effort must have served readers well, as PC World went on to become the most read technology magazine in the world. So why change now? "We wanted the chance to reflect on readers' needs, on what we were delivering, and on how we could pull those strengths into sharper focus," Kanes explains. He and the team at Don Morris Design, a New York-based studio that also worked on the 1996 redesign, set out to give PC World a fresh and contemporary look while making it more concise, businesslike, and direct. That's Kanes in the center of the photo, along with Don Morris (left) and Josh Klenert of the Morris studio.

### WHAT'S NEW, WHAT'S NOT

YOU HOLD THE results of their work in your hand. Probably the first thing you'll notice is that the core content has hardly changed at all. Most of the familiar departments, columns, reviews, and features are still here, but with a new look.

We did, however, use the redesign as an opportunity to implement some new features. Perhaps the most striking are the Star Ratings for product reviews (for a more detailed explanation, see page 155). This system, spearheaded by Reviews Executive Editor Tracey Capen, assigns a rating of zero to five stars based on criteria such as quality, usability, and execution. "We'll calculate a star rating for nearly every product that gets hands-on evaluation, whether or not that product goes on to lab testing," says Capen.

### Our new design makes the magazine easier to read and more useful.



You'll also find an improved system for Web addresses. All URLs are now printed in blue so that they're easier to spot.

### COMING UP IN OCTOBER

Let's Make a Deal: Should you buy your next PC in a retail store? Online? Over the phone? We help you find the best values. Perk Up Your Web Site: Learn easy ways to add slide shows, menus, and more. Burning Questions: We put today's best And for long addresses, our new Find-It system reduces any complicated URL to a five-digit code. Take the review of Sony's Clié PEG-N710C on page 70. Point your browser to the Find-It address on that page—find.pcworld.com/10843—and you'll go straight to information about the product on our Web site (the real URL exceeds 100 characters). We'll use Find-It numbers to steer you to any page with a painfully long URL, including sites for printer drivers and software patches.

As for other changes, check out the Top 100, which has a new closing page (page 177) that summarizes recent charts. The news section, renamed *News and Trends*, now appears earlier in the magazine (page 24). Contributing Editor Brad Grimes takes over the *Web Savvy* column (page 53) from Features Executive Editor Harry McCracken, who is increasingly busy with issue planning. And Andrew Brandt's *Privacy Watch* column, which won two recent national awards for online column of the year, moves to print in an expanded *Consumer Watch* (page 45).

In short, the new design should help you get better use out of *PC World* without detracting from the parts you already enjoy. Comments or suggestions? Write directly to me at eddir@pcworld.com.

CD-RW drives through their paces to find out which ones come out on top.

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What's new and what's next in technology.



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# **CPU WARS 2001** AMD AND INTEL ROLL OUT NEXT-GENERATION

### CPU TECHNOLOGIES IN HIGH-END NOTEBOOKS. NEXT STOP: YOUR DESKTOP. BY DAVID ESSEX

AMD AND INTEL are at war again, this time

versions of their mobile Pentium III and Athlon processors. Both feature hot new technologies that should soon boost desktop performance. And both have something to offer to the right buyers.

Athlon 4 is based on a core (code-named Palomino) due in new desktop CPUs this fall and already used in Athlon MP CPUs for dual-processor workstations and servers. Introduced at clock speeds between 850 MHz and 1 GHz. Athlon 4 is AMD's first challenge to Intel's line of Mobile Pentium III CPUs in the highend notebook market.

Intel's answer: The Mobile Pentium III Processor-M (formerly code-named Tualatin).

TEST

to 1.13 GHz, the Penwith next-generation Center tium III-M is Intel's first mass-market chip to use a .13-micron manufacturing process, which makes it smaller, faster, cooler-running, and less power-hungry than any current .18-micron-process CPU. Already used in some Pentium III server CPUs, the .13-micron process will migrate to Pentium IIIs for small desktops and to the next version of Intel's flagship Pentium 4 desktop CPUs (code-named Northwood), probably by year's end. That could reenergize the desktop contest, where Athlons now regularly trounce Pentium 4s.

Running at speeds up

In our tests of the first laptops with Athlon 4 and PIII-M processors, the new Intel chip

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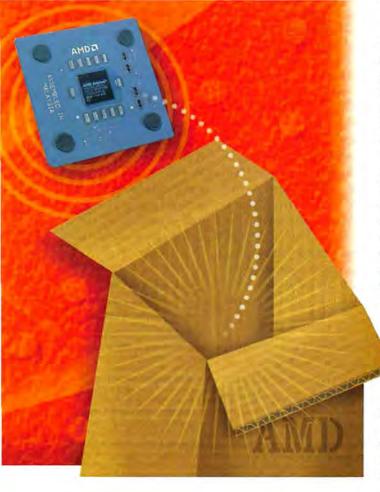
showed more pure computing muscle. On the other hand, the Athlon may be a better buy—though it's certainly not the Mobile PIII killer AMD was probably hoping for.

### THE CONTESTANTS

THE ATHLON 4 introduces three important design innovations. Its 256KB Level 2 cache adds a prefetch feature that AMD claims will improve the performance of existing software by 5 to 15 percent by preloading some instructions from RAM. A set of 52 new graphics instructions, called 3DNow Professional, supports new and upcoming games and graphics-intensive apps that take advantage of Intel's Streaming SIMD Extensions.

Also new is an enhanced version of PowerNow, originally introduced on AMD's K6-2+ and K6-III+ chips for lower-end notebooks as the company's answer to Intel's SpeedStep power-saving technology. You can set Power-Now to adjust the CPU clock speed depending on application demand, or to maximize either clock speed or battery power. On Athlon 4s (and on new mobile Durons), AMD says, PowerNow adjusts more rapidly than on previous chips.

On the PIII-M, the smaller core made possible by the .13micron process allows Intel to boost the chip's L2 cache from 256KB to 512KB, promising even better performance as more instructions become



accessible in the cache. In addition, the PIII-M and its companion 830 chip set boost the front-side bus from 100 MHz to 133 MHz, another speed enhancer. (The Athlon 4's bus speed is 200 MHz, like its predecessor's, but the first notebooks that will be equipped with DDR memory to take advantage of the faster bus aren't expected before year's end.)

Intel isn't conceding the battery-management challenge, either. The PIII-M enhances SpeedStep by adding demandbased switching between different power-use states. Yet another new feature, called Deeper Sleep, dynamically lowers the processor voltage as system demands decrease for example, when a screen display stops changing.

### WIN, PLACE, SHOW

THE INTEL chip emerged as the leader in our tests-not surprising given its fast clock speed and larger secondary cache. A preproduction Dell Inspiron 8100 running Windows 2000 and carrying a 1.13-GHz PIII-M and 256MB of SDRAM ran up the highest PC WorldBench 2000 score ever for a notebook, earning a mark of 210 on our tests of office applications, communications software, graphics programs, and multitasking. Its advantage of nearly 15 percent over the average score earned by five previously tested non-Tualatin 1-GHz PIII notebooks (also running Windows 2000) is quite impressive-and a bit higher than the chip's 13 percent clock-speed increase. Our preproduction Athlon 4-based Compag Presario 1200 equipped with 128MB of SDRAM-and running the

### IN BRIEF

### Pipeline

ALL-DAY NOTEBOOK: Compag says its ultrathin, 2.5pound Evo Notebook N200 will run longer than 7 hours (using an optional second lithium ion battery).

2.5 Due out by the end of the year.

the new laptop will be powered by Intel's Ultra Low Voltage Pentium III. Pricing hasn't yet been determined. WINDOWS CE RETURNS: Casio's latest PDA is a \$300 palm-size device, but it's not a Pocket PC. The BE300 Pocket Manager's simple organizer functions run on Windows CE 3.0, but you don't get the Pocket Office apps and other extras that come with Pocket PCs.

slower Windows Me OS matched the performance of earlier mobile PIIIs, but did no better. Its PC WorldBench 2000 score of 152 put the Presario in a statistical tie with two Windows Me notebooks using 1-GHz mobile PIIIs.

Neither chip performed impressively in battery life testing. Despite the Athlon 4's inherently less power-efficient .18-micron design, the Presario 1200 lasted 2 hours, 22 minutes in full-performance mode-14 minutes (almost 11 percent) longer than the Inspiron 8100. The machines had virtually identical battery lives in automatic power-saving mode: Their scores of 2:36 (Presario) and 2:34 (Inspiron) were on the low end for the notebooks we've tested.

#### TEST REPORT PENTIUM III-M AND ATHLON 4 PROCESSORS

	INIC	L MAINTAINS MUDILE MASTERT						
NOTEBOOK	Processor	System	Operating system	Level 2 cache	Graphics chip set	Graphics memory	PC WorldBench 2000 score	Battery life, full power/automatic '
Compaq Presario 1200	Athlon 4-1000	128MB SDRAM	Windows Me	256KB	ATI Rage Mobility	8MB SDRAM	152	2:22/2:36
Dell Inspiron 8100	Pentium III Processor-M-1133/733	256MB SDRAM	Windows 2000	512KB	NVidia GeForce2 Go	32MB DDR SDRAM	210	2:08/2:34
Average of five laptops	Pentium III-1000/700	256MB SDRAM	Windows 2000	256KB	Not applicable	Not applicable	183	Not applicable
Average of two laptops	Pentium III-1000/700	128MB SDRAM	Windows Me	256KB	Not applicable	Not applicable	155	Not applicable

### INTEL MAINTAINC MODILE MACTERY

How We Test We test all systems with PC WorldBench 2000, PC World's applications-based benchmark. See www.oc orld.com/benchmark for more details on our benchmark. For TEST the battery test, we drain and fully recharge the battery twice and set power-saving options to match consistent high-performance and default profiles where possible. Office workers use Windows 9x applications, periodically saving and allowing regular idle time. Notebooks are rotated among workers. We report the time elapsed until the notebook shuts Center itself off. Higher scores on both tests are better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. Hours:minutes.

Of course, you pay for the power the PIII-M deliversand for all the beefy accoutrements that go with it.

### POWER AND PRICE

WITH A street price of \$3206, the PIII-M-based Inspiron 8100 is clearly designed for users looking for desktop replacements or game mavens who demand the latest audio, video, and graphics. Besides carrying a whopping 256MB of SDRAM, the 8100 comes with a top-of-the-line NVidia GeForce2 Go notebook graphics chip-packed with 32MB of DDR SDRAM-as well as a supersharp UXGA (1600-by-1200-pixel) display. IBM's new 48GB Travelstar 48GH hard drive is huge for a notebook component, and the combination 6X DVD and 4X/4X/24X CD-RW drive is more than adequate for playing DVD movies and recording multimedia.

In contrast, the \$1918 Compag remains firmly grounded in the Presario 1200 midrange home-office tradition, with 128MB of 133-MHz SDRAM. a 20GB Hitachi hard drive, and ATI Rage Mobility graphics with 8MB of SDRAM. Like the Inspiron, it has a 6X DVD and 4X/4X/24X CD-RW drive.



NEW NOTES: Athlon 4-based Compaq (left) and PIII-M-powered Dell.

Intel says Compag. Gateway, IBM, Toshiba, and other vendors will introduce PIII-M notebooks this fall. At press time. HP was the only vendor aside from Compag that had announced an Athlon 4-based notebook in the United States.

What's next in mobile computing? Intel's road map includes higher clock speeds and new low-voltage and ultralow-voltage models starting at 750 and 600 MHz, respectively-an apparent rejoinder to Transmeta's similarly positioned Crusoe chip. Also expected next year is a mobile version of the company's true next-generation chip, the Pentium 4. AMD plans to counter with a .13-micron Athlon 4. code-named Thoroughbred, by the first half of 2002, followed later that year by siliconon-insulator technology that AMD says will increase power efficiency by up to 30 percent.

### **FINISH LINE**

WITH Intel's PIII-M stealing the performance thunder, somewhat bulkier Athlon 4 notebooks might have to settle for a sweet spot just behind the leading edge, in systems priced in the vicinity of \$2000. They're the better choice if you need a serviceable platform

for office apps and the occasional game or DVD movie. But if desktop-class multimedia is your style, or if you want the most powerful processor money can buy, go for a loaded PIII-M system, reasonably priced at around \$3000. Either way, consumers are the winners in this chip race.

### AMD Athlon 4 ++++

No technology breakthrough, but a solid competitor to mobile Pentium IIIs at a favorable price. find.pcworld.com/11005 Intel Mobile Pentium III Processor-M

### \*\*\*\*1

A fairly substantial leap in technology produces the fastest notebook chip to date, but don't expect bargain-basement prices. find.pcworld.com/11006

#### Compag Presario 1200

(Preproduction unit, not rated) Solid, if not svelte, notebook for general business use at a good price. Street price: \$1918 find.pcworld.com/11008

### **Dell Inspiron 8100**

(Preproduction unit, not rated) Fastest notebook we've seen to date, loaded with everything a power user or gamer could want-and priced accordingly. Street price: \$3206 find peworld.com/11007

# CD-RW DRIVE PRICES TO FALL

### THANKS TO OVERSTOCK AND RELATIVELY LOW DEMAND, CD-RW DRIVE COSTS TUMBLE.

MOVE OVER, PC price wars: Right now there's an equally intense battle for your dollars on the CD-RW drive front. Though the downward price spiral has been going on for months, competition has heated up as next-generation 20X and 24X CD-RW drives hit the market, forcing vendors to sell off existing inventories.

Further sharpening the shears is the slowdown in the PC market, which is responsible for the drive surplus to begin with. Put the two together, and you get great bargains. In fact, by September, some industry experts expect 12X/10X/32X CD-RW drives will be selling for \$100, faster 16X/10X/40X drives for \$150, and state-of-the-art 24X/10X/ 40X drives for \$200—nearly \$100 off the price at which TDK introduced the first 24X drive in June. Such price drops normally happen over six months or so, not three.

### REBATE GAMES

YOU'LL HAVE to read the advertising on these deals closely, however. One way for manufacturers to avoid lowering prices sooner than planned is to push rebate offers—which don't help you unless you redeem them (and which may go astray even then).

Open any newspaper's sales fliers, and you'll see a splash of rebates for CD-RW drives. For example, Yamaha is offering a \$240 16X drive with a \$50 rebate through year's end.

Too often, though, rebates have been little more than a



marketing ploy for many companies. In headier times, a vendor could expect most consumers not to bother sending them in. But cost-conscious buyers now expect rebates to be honored, and vendors know they'll have to pay up.

"We get a much higher redemption rate than we used to," acknowledges Pacific Digital's Tony Tate, vice president of sales and marketing.

### **RIPPING PRICES**

WHY ARE bargain drives now flooding the market? "It's all about demand and supply," explains IDC research manager Wolfgang Schlichting. "Last year, CD-RW drives had a fairly healthy profit margin, as most computer manufacturers couldn't get all of the drives they wanted."

In response to increasing demand, drive vendors stepped up production, and more manufacturers, such as Samsung and LG Electronics, invested heavily in CD-RW drive production. But buyers began to vanish just as the bulk of new products came to market.

"We have seen a very swift drop in price, especially on 12X models" as a result, says Patricia O'Donnell Smith, hardware product manager at TDK Electronics, maker of *PC World's* current Best Buy, the 16/10/40 VeloCD ReWriter.

Moreover, cheaper 12X models affect 16X drive sales.

### CONSUMER ALERT

## EASY CD CREATOR-NEW COPYRIGHT COP?

TO HELP RECORD labels collect revenue for digital music-while giving consumers a way to legally acquire tunes and burn CDs-Roxio, maker of Easy CD Creator, will integrate digital rights management (DRM) encryption/decryption code into future versions of its popular software.

Under a partnership between Roxio and EMI Recorded Music, users of the new software will be able to download copy-protected songs from EMI's site and burn them onto CDs-once they've paid the fees. The companies haven't yet decided how many copies a consumer will be allowed to burn. Roxio says it's discussing similar arrangements with other major record labels.

Roxio CEO Chris Gorog says the company hopes to have a live consumer model of the whole scheme in the next 16 months. Roxio is trying to make the rights management process invisible to the end user, and though the new software will handle EMI's particular approach, it can be modified to recognize and decode other DRM schemes.

Not surprisingly, music studios generally support Roxio's initiative. Whether consumers will is another question. Current users are accustomed to ripping music from audio CDs or downloading songs and burning them without restrictions. But copy protection is proliferating on the Web, and Macrovision's SafeAudio technology has already been built in to some audio CDs to prevent clear ripping and duplication. Industry experts believe such protection will become more commonplace.

Traditional music and video distribution will be eclipsed over the next decade by digital distribution via the Net, Gorog says, adding: "We're trying to figure out a way for the consumer to get this content legally." -Melissa J. Perenson, Anush Yegyazarian "There's always the pressure from the bottom," explains O'Donnell Smith, who says buyers expect to pay \$50 for the next highest speed. "If the price drops majorly on 12X, then 16X will have to follow."

### WILL IT LAST?

FASTER DRIVES will still be introduced at a premium, but don't expect their prices to stay high for long. And while some experts believe the market will eventually stabilize (perhaps as soon as the end of the year), others feel that the cutthroat price competition is permanent. "Too many players have ruined the price," says Jason Huang, product manager for optical drives at Acer Multimedia and Communications. "And manufacturers need to keep the [sales] momentum to at least cover their fixed costs."

Until prices do stabilize, rough times are ahead for manufacturers. Some of the smaller players may not survive, notes IDC's Schlichting.

In the meantime, you can get a great deal on that CD-RW drive you've been eyeing. -Melissa J. Perenson

DVD DRIVES

# **DVD RECORDING UPDATE**

## WE TEST NEW DVD-RW MEDIA AND ONE OF THE FIRST DVD-RAM/DVD-R DRIVES.

OUR FIRST look at Pioneer's DVR-A03 DVD-R drive a couple of months back was love at first sight. This all-purpose drive writes roomy 4.7GB DVD-R discs at 2X, CD-R discs at 8X, and CD-RWs at 4X: and it reads almost all optical media types, including DVD-ROM at 4X. (With CD technology, 1X is equal to 150 KBps; with DVD, 1X is equal to 1.38 MBps.) Pioneer wasn't hyping it at the time, but its drive also writes DVD-RW at 1X; the company's reticence was due to the lack of version 1.1 DVD-RW media.

Version 1.0 media—sold only in Japan—had an encryption code block that made bitby-bit copying of commercial

DVR-A03 DVD-R drive Street: \$800; Pioneer, find.pcworld.com/11040 LF-D311N DVDBurner DVD-RAM/DVD-R drive Street: \$549; Panasonic, find.pcworld.com/11041 PANASONIC'S LF-D311N DVD-Burner drive (\$549), a combination DVD-RAM and DVD-R unit.

DVDs impossible. And with the block, only the DVD-RW video recorders that 1.0 media was meant for could initialize the discs. The new 1.1 media takes care of that issue, but unfortunately most existing DVD drives and players misinterpret 1.1 DVD-RW media as dual-layer DVD, so compatibility is still very limited. Pioneer claims that a firmware upgrade of most DVD drives and players will let them read 1.1 media. That may work for your PC's DVD-ROM drive, but it will be far more difficult, if not impossible, for your

living-room DVD player. We used the DVR-A03 to test 1.1 media, writing 4.2GB of data to a disc, erasing the disc, and repeating the process several times. Each write pass took just over 53 minutesspot on for 1X writingwithout an error. We also burned a DVD movie and finalized the disc as required to test compatibility with home DVD players. Our test discs worked fine in the DVR-A03; unlike DVD-R, however, they were unreadable in other DVD-ROM drives, a Panasonic DR-E10 recorder, and a Toshiba DVD player.

Price may also be an issue. Although the \$800 DVR-A03 is inexpensive compared with the \$5000 that DVD-R drives previously cost, it's hardly an impulse buy. There is now a cheaper, albeit less versatile option: Panasonic's \$549 LF-D311N DVDBurner drive, a second-generation, 4.7GB-per-

### IN BRIEF

### Pipeline

TINY STORAGE: M-Systems' DiskOnKey is a miniature USB flash disk on a keychain. Use it to carry your house keysand data files totaling between BMB (\$50) and 64MB (\$130). No driver installation is required on most operating systems.

PETITE PROJECTORS: Now that everybody and his brother are selling 3-pound data projectors, Plus Corporation is readying the next entry in the portability race. The statistics on the company's new V Series models (which are due by the end of the year, prices to be announced):

V-8075F	V08075F		
Resolution:	Resolution:		
XGA	SVGA		
Brightness:	Brightness:		
BOO ANSI	700 ANSI		
lumens	lumens		
Weight: 2 lbs.	Weight: 2 lbs.		

side DVD-RAM drive that can also write DVD-R. But it writes DVD-R at only 1X, taking 60 minutes to write a full disc versus the DVR-A03's 30 minutes. And it can't write DVD-RW, CD-R, and CD-RW, as the Pioneer drive can. Still, the LF-D311N passed our DVD-R data and movie burn tests with flying colors; it offers DVD-RAM's promise of 100,000times rewrite capability; and it saves you more than \$200.

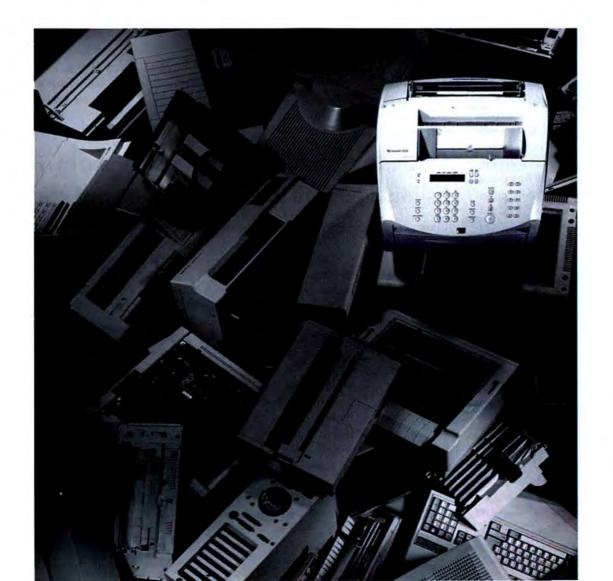
Confused yet? Well, there's more: Drives using yet another rewritable DVD standard, DVD+RW, will be on the market this fall. We'll have more to say about those products in coming months. For information about which of these features is available in this or other models, go to www.hp.com/go/printers-us.



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. Relieves potential headache situations for IT managers. It is now what the future of printing will be.

The new evolved printers from hp.

### Hey, what's the future doing here?



### HARD DRIVES

# **100GB & LARGER**

### DESKTOP DRIVES HAVE REACHED 100GB, AND LARGER MODELS ARE WAITING IN THE WINGS, BUT TECHNICAL LIMITS STAND IN THE WAY.

SUPERSIZE hard drives are coming to the desktop: 100GB IDE drives are shipping, with even larger drives in sight.

What can you do with all that storage? Keep and edit digital video, for one thing an hour of uncompressed video uses about 13GB of space. You can also centralize your MP3 files (as many as 25,000 4-minute songs encoded at 128 kbps) or store a truckload of digital photos (over 10,000 3.3-megapixel shots).

These large drives happen to be just right for a new market: personal video recorders, such as TiVo, which can easily use more room. Even users without massive storage needs benefit as new units and technology lower prices on popular 20GB to 60GB hard drives.

We looked at two big drives: Maxtor's 100GB Diamond-Max 536DX (\$300) and Seagate's 80GB U series (\$234). Both installed easily and performed up to spec. Maxtor has an 80GB drive (\$230), too. All three are rated at 5400 rpm.

Want something faster? At press time, Seagate launched a 7200-rpm, 80GB drive, the \$275 Barracuda ATA IV, and Western Digital came out with its 7200-rpm, 100GB entry, the WD1000BB (\$299, list).

### **BIG-DRIVE BARRIER**

THE NEW 100GB drives are approaching the technical limitations of the current ATA standard, which governs data transfers to and from most hard drives. The standard uses a 28-bit addressing system that can't recognize more than 137.4GB of storage.

Drafts for the latest ATA standard, version 6, adopt a 48-bit addressing system, raising maximum drive capacity more than a millionfold to 144 petabytes (a petabyte equals a million gigabytes). Petabyte drives are years off, but Maxtor expects to offer drives exceeding 137GB this year.

To make such drives work, advocates of the new standard say drives need updated controller chips, and PCs need operating system drivers that use 48-bit data addressing.



BIOSs may balk at the new addressing scheme, though. If those BIOSs can't be upgraded, users will need new PCs, or at least new motherboards, to handle the larger drives.

### EVER BIGGER

DRIVES AS LARGE as 400GB should be available in just a couple of years as vendors continue to increase the quanvelopment for IBM, believes the limit lies around 5GB.

Because of this anticipated limit, IBM is using a new disk material, nicknamed "pixie dust." Placed between two layers of magnetic material, it helps data remain stable at ever-higher densities. (Other vendors are experimenting with similar technologies.) IBM already uses pixie dust in

# Desktop hard drives larger than 400GB should be available in just a couple of years.

Chips should arrive before year's end, according to Maxtor. Microsoft plans to include support for 48-bit addressing in its forthcoming Windows XP OS and may add the feature to the next Windows 2000 Server service pack. Alreadycomplete Linux drivers may be part of Kernel 2.5 or even 2.4. Availability of support for Macs is unclear.

Other PC components including cables and motherboards—shouldn't require upgrades, says Dan Havey, U.S. marketing director for chip set maker Via Technologies. Havey thinks that some older tity of data a drive can store per square inch of disk—a measure known as areal density. Today's areal density champs, new Toshiba notebook drives, pack 4.4GB per square inch.

Industry experts agree that, using conventional magnetic technologies, at some point manufacturers won't be able to increase areal density and store data stably at the same time. Gartner Dataquest analyst John Monroe thinks areal density can go to 12.5GB per square inch at least (yielding 532GB four-platter drives). But Currie Munce, director of advanced hard disk drive desome of its notebook drives, and plans to use it in all future drives, aiming for 500GB to 600GB four-platter desktop drives by 2003.

Will even digital videophiles use such vast-capacity drives? Given the way digital video devours space, probably. Still, most people won't qualify as videophiles, at least until video editing becomes simpler, says IDC analyst Dave Reinsel. In the meantime, the larger hard drives may find their way into your home inside your digital video recorder, rather than inside your computer.

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

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### YOUR RIGHTS

# **PC LEMON LAWS**

### NEW LAWS IN THE WORKS MAY HELP YOU IF YOUR NEW PC TURNS OUT TO BE A LEMON.

IF YOUR new car is a lemon, state laws protect you. But if your new PC is DOA, getting satisfaction is a crap shoot. Depending on your vendor's service terms, you might get a new, working PC or your money back. Or you may face weeks on the phone with tech

support trying to fix something that can't be repaired.

In PC World's January Reliability and Service survey, nearly 1 out of 11 respondents said their new PC didn't work when they first turned it on. (Watch for the results of our next survey of readers' experiences in the November issue.) **Consumers** Union estimates that 5 percent of desktop PCs sold since 1996 did not work on arrival and that 11 percent

of PCs had serious problems in their first month of use.

Lousy reliability is the reason automobile lemon laws were enacted. Now, for precisely the same reason, states are turning their attention to the PC industry.

### SOURED ON A PC

MOST PEOPLE expect a PC's warranty to provide adequate coverage, but as George Scully found, many ifs and wherefores lurk in warranty promises. Scully bought a Gateway computer in January for his college-bound daughter. A week later, it wouldn't boot.

Scully tried Gateway's customer service first, then returned to the company store where he purchased the PC. Store personnel agreed to fix it, but only if Scully waived all



ILLINOIS STATE LEGISLATOR George Scully sponsored the Computer Lemon Act in his state.

previous verbal and written agreements and agreed to settle any further concerns by out-of-state arbitration, which is Gateway's company policy.

Wrong answer.

"The computer's a week old. Why do 1 want to go to a National Arbitration Forum in South Dakota when we've got a state courthouse only a few miles away?" Scully asks.

George Scully is an Illinois state legislator and the key sponsor of a proposed PC lemon act. He didn't mention his sponsorship of the bill during his arguments with Gateway, but he did threaten a lawsuit. The store manager ended up giving Scully his money back. (Gateway includes a standard 30-day limited money-back guarantee with all new products.)

### LAY DOWN THE LAW

BESIDES focusing on their warranty, owners of lemon PCs can fall back on the Magnuson-Moss Warranty Act, a federal statute enacted long before PCs became a house-

hold commodity.

Scully argues that the Magnuson-Moss law has only vague standards prescribing what vendors must do to correct problems. He thinks that PC buyers need specific laws to protect them from warranty abuses and ineffective repairs, so he is sponsoring the **Computer** Lemon Act. The Illinois House of Representatives approved the bill last spring. The state senate will likely consider it this fall.

A similar law proposed in Pennsylvania last year failed; it may be reintroduced this year.

### LAWS NEEDED?

MOST PC vendors we spoke with, including Dell and Gateway, think existing laws and warranties do a satisfactory job of protecting consumers and handling service and repair needs. And vendors do make good-faith efforts to resolve problems—through telephone support, on-site technician visits, and more.

### IN BRIEF

### Tidbytes

GET XP EARLY? If you can't wait to get Windows XP, think about buying a new PC. Direct vendors may start selling systems with XP preinstalled before the official October 25 launch date.

NEW NAPSTER? Netherlands-based FastTrack's technology simplifies and speeds up peer-to-peer sharing of music, video, and other files. The research firm Webnoize expects FastTrack networks to support a million simultaneous users by September. Access is via clients such as Kazaa and Grokster.

### **Did You Know?**

SURF AT WORK: 4220 More than Americans logged on to the Internet from work for an average of 22.5 hours in June 2001, wase meanwhiles

Warranties protect both sellers and buyers. But it's hard to craft warranties that buyers understand and that meet a vendor's legal needs, says Jim Hobby, Gateway's VP of customer care. "The United States is becoming a more litigious society, which unfortunately puts us in a position to write ten-page warranties."

But warranties simply don't give consumers complete protection, Scully contends.

"It's good public policy to put bills out there for discussion to make the manufacturers and retailers aware there is a problem," he said. "We need to tell them, 'If you don't fix it, the state legislatures will.'"

-Frank Thorsberg 🕨

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#### PRIVACY

## WILL BIG BROTHER TRACK YOU BY CELL PHONE?

## THE FCC REQUIRES CELL PHONE COMPANIES TO TRACK YOU, IN ORDER TO FIND YOU WHEN YOU CALL 911-BUT WHAT ABOUT YOUR PRIVACY?

YOUR NEXT cell phone may be able to tell your mobile carrier—and possibly others exactly where you are and where you've been.

Starting in October, new cell phones will contain Global Positioning System units for use with location services offering emergency help, traffic and shopping aids, and more.

But the questions of what such services do with the data they gather on you and who can access it raise a host of privacy concerns that are far from resolved.

#### YOU ARE HERE

CELL PHONE tracking was propelled by the Federal Communications Commission, which adopted enhanced 911 rules to cover wireless services. For E911's first phase, cellular carriers must be able to pinpoint, to the nearest cell tower, the location of someone calling 911. For Phase II, carriers must be able to pinpoint a 911 caller's location to within 50 to 300 meters.

FCC requirements mandate that the first phones equipped with Phase II capabilities appear this October; nearly all cell phones are supposed to comply by 2005. Thus far, Sprint PCS is the only major carrier that claims to be on schedule to ship some location-enabled phones this fall.

Naturally, vendors want to

take advantage of the mandated location features to offer you something beyond emergency help—and more targeted than the info on nearby ATMs and movies you can

111

ads for McDonalds every time you pass by the golden arches. Carriers don't want to annoy users because it's so easy to switch providers, says Allen Nogee, a senior analyst at Cahners In-Stat Group.

The GPS units required for location services should add less than \$50 to phone costs according to Cahners In-Stat. Carriers may cover costs or pass them on as part of fee-based service plans. You'll probably have to buy a new phone to get the services, but companies

already get. All major carriers su have plans, but none have in released specifics. As a result, in various issues—costs, exactly ce how the services will work, and whether your location will be broadcast the moment you As turn your phone on (a battery ab drain) or only on request— ad

Advertisers are eager to use location services to alert you when you pass near a store that might be of interest. Such services are likely in some form, but carriers are proceeding cautiously. They're aware you may not want to see

remain unresolved.

such as Airbiquity are designing batteries containing builtin GPS units you could add to certain existing phones.

#### EYE ON YOU

AS CELL phones with tracking abilities come to market, myriad privacy concerns loom.

For example, should government agencies, including law enforcement, have unfettered access to your GPS data? If your provider—or any thirdparty company it contracts with—stores your location info, government agents could access it fairly easily. Also, will you soon have to contend with mega-marketing databases that keep tabs on where and how often you shop, and with cell phone spam?

Letting consumers opt out is one answer to these concerns. The Wireless Communications and Public Safety Act of 1999 states that without express prior authorization, a user shall not be considered to have approved access to location information from commercial mobile services. A bill now in a House of Representatives subcommittee would go further, explicitly requiring "customer consent to the provision of wireless call location information." A similar new bill in the Senate would require providers to notify users when the service tracks them. and prohibit providers from disclosing or selling data without getting customer consent.

The Cellular Telecommunications & Internet Association, which represents handset makers and carriers, has

also acted. It petitioned the FCC to set up common rules for carriers governing how to notify users and obtain con-

sent for location services, as well as to establish privacy and security standards for user data. CTIA also asked the FCC to allow a safe harbor for those following FCC rules.

Carriers have an economic incentive to protect your privacy, but location technology providers that some carriers use may not, Nogee warns.

As services roll out, both consumers and providers will start working through these thorny issues. Still to be determined: whether users bite and are willing to pay at all.

-Cameron Crouch 🕨



The scar from the shark off Peru.

The scar from the reefs off Baja.

The scar from the fishing trawler off San Clemente.

The scar from the rocks off Alaska.



Life, they say, is in the details. And no detail escapes the Sony Digital8<sup>s</sup> Handycam' camcorder. Not only does Digital8 let you record high resolution digital video on affordable 8mm tape, but it captures stunningly crisp digital still images on Memory Stick<sup>®</sup> media. The i.LINK<sup>®</sup> (IEEE 1394)<sup>s</sup> DV Interface lets you easily transfer and edit video like never before. With SteadyShot<sup>®</sup> Picture Stabilization System, shaky shots are all but extinct. Plus, record in total darkness with NightShot<sup>®</sup> O Digital8 Lux Recording System. Sony Digital8 camcorders. Because when there's more in your camera, there's more in your movies. www.sony.com/di



#### BROADBAND

## BEYOND DSL AND CABLE

#### FIBER OPTICS MAKES SUPERFAST INTERNET ACCESS AFFORDABLE-IF YOU CAN GET IT.

DSL AND CABLE modems still too slow for you? Fiber-optic technology could be the answer, offering super-highspeed Internet access and easily variable bandwidth at a fraction of the cost of service on traditional copper lines. Once affordable and attainable only by large enterprises, fiber-optic technology is beginning to attract small businesses and even a handful of consumers. But some major financial and technical roadblocks remain.

Companies such as InSors, an 18-employee videoconferencing firm in Illinois, are discovering that fiber-optic connections make an economical alternative to T1 and T3 Internet lines. In-Sors pays a \$1000 monthly fee to Cogent Communications for network speeds of 100 megabits per second. By comparison, a T1 line with just 1.5 mbps of bandwidth can cost \$600 to \$1500 a month. And upgrading a T1 to a fractional T3 can take a month, with the resulting 3-mbps service costing \$2000 a month or more.

"We've got an enterpriseclass network at a small-business price," says Brian Gleason, InSors vice president of business development.

John Holland is director of business development at Nx-Tier Technologies, a logistics management firm for the trucking industry in Worcester, Massachusetts. His company gets fast 10-mbps access for \$4000 a month. Better still, on 3 hours' notice, NxTier can up its bandwidth tenfold without having to pay its provider,

Yipes Communications, for additional line installations. "Our network can grow as fast as we need it," Holland says.

#### **HEART OF GLASS**

UNLIKE current high-speed broadband technology that transmits data over copper and coaxial cable lines, fiberoptic technology can easily handle massive data traffic, along with voice and video, on a single hair-thin line composed of glass.

And prices for fiber-optic access have fallen, thanks to advances in the technology and to a glut of capacity born of a 1990s construction boom. During that decade, firms like Level 3 and Quest Communications spent billions of dollars in a race to build crosscountry fiber optic networks in advance of demand. Burdened with debt, these and other firms went from Wall Street's darlings to dogs.

Meanwhile, a number of relatively small and

nimble companies—including Cogent, Telseon, and Yipes—have begun to find customers for "gigabit ethernet" services. These newcomers focus on building hookups from underground cables to their customers (which are mostly small and mediumsize businesses) in the

United States' 20 largest metropolitan areas.

#### A HARD LAST MILE

EVEN SO, mass adoption of fiber-optic broadband is by no means imminent.

One complication: Building a network's "last mile"—the line that branches to a single customer—is costly, says analyst Sterling Perrin of market research firm IDC.

Today in the United States, copper telephone line touches about 200 million businesses and homes, while fiber reaches only about 40,000 businesses and far fewer residences, says Dave Schaeffer, Cogent's chief executive officer.

Still, some lucky folks are already getting a taste of fiberoptic life. SBC Communications is serving 150 businesses in Texas with fiber-optic lines. It expects to serve about 6000 more with fiber optics by the end of next year, at speeds of 1.5 mbps and up.

That is speed to burn.

-Tom Spring 🔳

IN BRIEF Site to See

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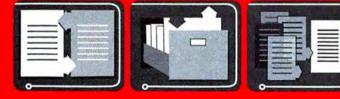




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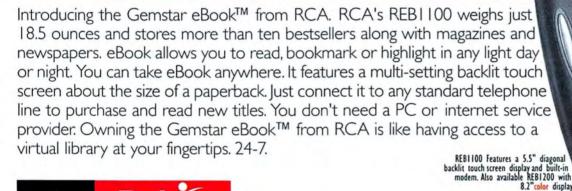
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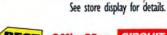
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#### BEST OF 2001 DEBATED

HOME WIRELESS NETWORKS

#### BROADBAND WOES? CONSIDER ISDN



#### **OFFICE XP RATING**

REGARDING "Office XPosed" [July]: My college received an advance copy of Microsoft Office XP. It has many fine new features, but beware of backward-compatibility issues. When I finished a Power-Point presentation for a school's graduation using Office 2000 and then opened it in XP, the sound transitions were in disarray, and all the sounds and music tried to play at once. The problem was relatively easy to fix, but it was time-consuming. *Tom Pugh, Youngstown, Ohio* 

YOUR "BEST OF 2001" article [July] rates Microsoft Office XP as the best office suite. But then, in "Office XPosed" (page 103), you write that "If Microsoft's Office 2000 were an employee...this worker still may not be named Employee of the Year." Yet, by naming it to the Best of 2001 list, that is exactly what you did!

I use Office 2000 and WordPerfect 2000, and I like both. But the XP upgrade is primarily cosmetic, so I don't understand what justifies its steep price. And as you state on page 105, "wouldn't a superreliable suite be even better?" I believe Microsoft missed the mark with Office XP, so why should it be named Best Office Suite? There are only four real options in office suites, so here's my suggestion: Simply eliminate the category.

Jeffrey Tull, Socorro, New Mexico

Editors' response: Our articles aren't really contradictory. The review of Office XP clearly says that XP isn't perfect, but it improves on Office 2000. Similarly, in "Best of 2001," we note that Office XP isn't a massive upgrade, but makes many of Office 2000's features eas-

ier to use. Since virtually all our readers need an office suite, we felt that not naming a best product in that category would be a disservice. We picked the best one available and mentioned caveats.

-Ed Albro and Eric Dahl

#### MORE HOME WIRELESS NETS

YOUR STORY ON home wireless network products ["Wireless Comes Home," July] should have included one more. I run the Proxim Symphony wireless system on a two-PC/one-laptop network with a DSL gateway. Its ease of setup (mostly configured by the software as it is installed), cost, and range all made for a good value.

My DSL and the bridge (with internal firewall) are at the point where my phone line terminates, broadcasting to all the PCs on the network independently. I am now sitting outside on my deck approximately 200 feet from the gateway and receiving both 256-kbps speed on the DSL connection and streaming video from my son's room simultaneously.

Ross Lampky, via the Internet

I WAS DISAPPOINTED you didn't mention Intel's AnyPoint Wireless Home Networking system. I recently set up this network at home, and I'm thrilled with my laptop's network connection speed

#### HOT BUTTON

### Best of 2001–Readers' Nominations

WHY DID PC World choose Internet Explorer 5.5 for its Best Web Browser ["Best of 2001," July]? Have you tried Opera? The difference in compatibility is minuscule-pages in Opera load virtually the same, if not better, 99.5 percent of the time. Opera has a multiple-document interface that takes up much less RAM, wonderful cache programming, better (and more) hot-keys, better user control, and a great full-screen mode. I find new and useful things in Opera every day.

Justin M. Keyes, Tampa

I WAS SURPRISED, yet not surprised, to see Microsoft's Office XP Standard getting the nod as Best Office Suite. At work I use Microsoft Word, and at home I use Lotus Smartsuite's Word Pro. In my judgment, Word Pro is easier and smarter to work with, and simply more capable than Word. David A. Mayagoitia Fuller, Colorado Springs

I TAKE EXCEPTION to your calling Yahoo Mail a Best of 2001 [Best Free E-Mail]. Two of my e-mail accounts are with Excite and Yahoo. I use the Excite address regularly when I think a message may generate spam. I use the Yahoo account rarely, yet currently I have 58 messages in the Yahoo in-box and 88 in the junk mail folder. All are spam! If I get one spam a month at Excite, that's a lot. No matter how good it may be in other features, any free e-mail service that generates that much spam should not be given an award.

Jerry Owen, Bridgeport, Connecticut

#### LETTERS /

and with the net's sharing capabilities.

Configuring both my computers to network was a breeze, and the total cost of the hardware was about \$225. This compares very favorably with the systems mentioned in your article.

> Lakshmi Desiraju New Hope, Pennsylvania

YOUR ARTICLE didn't mention Zoom Telephonics. I've been using its Wi-Ficompliant products for a while, both at home and for an industrial application. So far, Zoom's products have performed perfectly, and its support is excellent. James S. Nasby, Skokie, Illinois

YOU RECOMMEND using hubs as your LAN system. Hubs are okay for inside a network, but you really should use a router between the Internet and your home network. Doing so adds one more thing a hacker has to get through.

Jon Bernhardt, via the Internet

#### BROADBAND BLUES II

WHY DOES nobody mention ISDN as an alternative to the migraines of cable and DSL ["Broadband Users Still Sing the Blues," *Top of the News*, June]? ISDN has been around for over 30 years, never goes down, and guarantees 128 kbps at all times. And there's the security of using dial-up, versus the "always on, always vulnerable" issues with cable and DSL.

Karl Ness, Minneapolis

#### CASE SOLVED

IN JULY'S *Top 10 Value PCs*, you complain of a difficulty in removing and replacing the side panel on the Dell Dimension 4100. Solution: Tip the tower slightly to the right while removing or replacing the panel so there is no weight on the left side of the base plate. The removable panel is also a structural part of the case, so when it is removed, the case sags to the left just enough to cause the difficulty. This also applies to earlier Dimension units with similar cases.

Peter Bennett, Carlisle, Pennsylvania

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

#### CORRECTIONS

IN AUGUST'S "Best of the Web 2001," we should have said that the PC Pitstop URL works only with Internet Explorer. Also, after we went to press, Homestead, which provides Web site hosting, started charging for some services.

In July's "Best of 2001," the name and URL of the Best Recreation/Entertainment Site should have been listed as Digital City, www.digitalcity.com.

July's *Top 15 Notebook PCs* should have said that a Pentium III-1000/700 SpeedStep processor powers Gateway's Solo 9500.

PC World regrets the errors.

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TIPS FOR REBATE SUCCESS ON YOUR SIDE: VISOR COMPLAINT

#### PRIVACY WATCH: PROTECT YOURSELF

## **Bait and Rebate**

Buy stuff, receive money back. It's a great deal-if you can get it.



THIS SUMMER, thousands of Cyber-Rebate customers were left high and dry when the company closed its doors and stopped issuing promised rebates. Cyber-Rebate wasn't a traditional rebate program, in which you buy a competitively priced printer (for example), send in the form, and wait for a check. Instead, it was like the XFL of rebate plans: a muchhyped, slightly contrived-sounding business. It promised that if you paid inflated prices for products—a \$50 telephone, for example, might cost \$350—and sent in the required forms, weeks later you'd get a check for most or all of the price you paid. In return for letting CyberRebate hold your money for as long as 14 weeks, you'd get a phone, PDA, or movie for free.

This scheme has more warning signs than a nuclear test range. But for a while it worked. People got hooked. When the company filed for Chapter 11 bankruptcy in May, it owed over \$83 million, mainly to consumers who never got their checks. (Visit find.pcworld.com/10845 for information on CyberRebate's bankruptcy and tips on what to do if you lost money.)

Clearly, CyberRebate is an extreme ex-

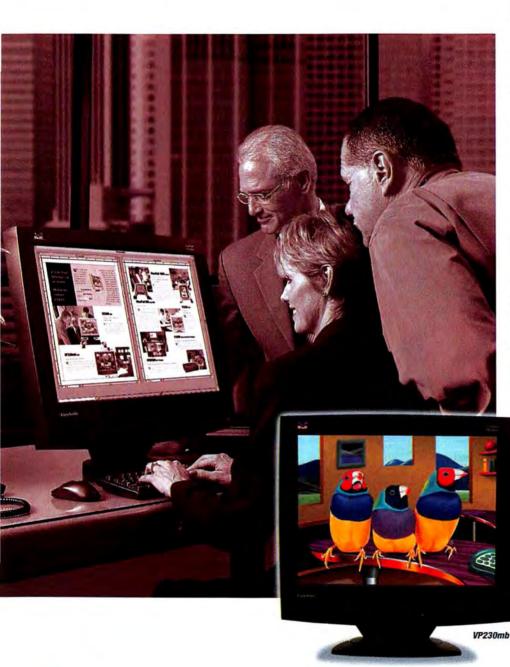
ample of rebates run amok. But how different is the CyberRebate experience from what we've all been through with typical rebates? Many of us have waited for a check that never arrives—with no vendor bankruptcy to blame it on. But getting a rebate doesn't have to be frustrating. I'll point out some of the gotchas and offer tips so you can make sure you receive what you're entitled to.

Why do so many companies fall short on their rebate promises? The usual excuse is that they become "overwhelmed" by consumer response and fall behind in processing and fulfilling the mail-in forms. Evidently, it doesn't take much to overwhelm those rebate departments. Studies have found that as few as 2 percent of consumers eligible for rebates apply for them. With such low response rates, companies should be able to hire enough people to handle the requests.

Of course, companies often hire outside firms to fulfill rebate obligations, creating a recipe for customer service meltdown: You contact the vendor to find out where your rebate check is, and the vendor sends you to the fulfillment house, whose employees may not know or care. A classic game of finger pointing ensues, and you're left feeling frustrated and powerless. Since obtaining a mail-in rebate usually depends on establishing a physical paper trail, you may be out of luck.

Another common complaint is that companies change the rebate rules or fail to make clear the ones that determine eligibility (for a good example, see *On Your Side*, page 47). Scott Smith of Kirkland, Washington, writes that OfficeMax rejected his \$45 rebate request for purchas-

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ing 200 blank CDs because he failed to provide an e-mail address on his form. "I [deliberately] omitted my e-mail address because I didn't want to get junk mail. What would someone without an e-mail address do—make one up? Or just not get the rebate?" Smith asks.

An OfficeMax spokesperson says the manufacturer that offered the rebate no longer requires an e-mail address and has offered to get Smith his rebate.

In a way, Smith was lucky all along: At least OfficeMax explained the rejection. Many customers who dutifully clip UPC labels and fill out request forms might as well drop them directly into the recycling bin. Whether the form gets lost in the mail, misdirected, or thrown away by an apathetic clerk is anyone's guess. Unfortunately, most consumers don't have the time and energy to harass companies until they make good on their obligations.

One egregious rebate problem involves retailers who offer generous discounts on PCs for customers who sign an extended contract for Internet service. These deals might sound good on the surface, especially to first-time buyers, but retailers often neglect to clarify the terms and conditions, which usually involve lengthy, inflexible, and expensive service contracts that can quickly offset any rebate savings. Consider these facts: The ISPs that offer rebates may not have access numbers you can dial for free; you may not like their service; and just as you commit yourself to three years of dial-up service, broadband may arrive in your neighbor-

#### ON YOUR SIDE

## Glitch in Handspring's Rebate Policy

I BOUGHT THE Handspring Visor Deluxe PDA for \$200, in part because of a \$50 rebate offer. I sent in the rebate form and my receipt. Weeks later I got a postcard from Handspring's rebate center stating that I didn't qualify because I paid less than \$249. (At that time, Handspring was selling the Visor Deluxe for \$249.) But the terms and conditions didn't specify that I had to purchase the PDA for \$249 in order to get the rebate. Please help.

Stuart Fineberg, Wilmette, Illinois

PC World responds: After researching this rebate issue, Handspring spokesperson Brian Jaquet acknowledged that "the company does not have a legitimate basis for denying the customer's request for a rebate check." Handspring did not notify its customers about a \$249 purchaseprice requirement, Jaquet says, and as a result the company will process Fineberg's \$50 rebate immediately. Fineberg can expect a rebate check to arrive within six to eight weeks. —Grace Aquino



Because he has new Office XP, today he'll be cruising in the express lane. He'll avoid the frustration of cutting, pasting and formatting between applications. He'll find that tasks that were once complicated become suddenly simple. He'll get the tools he needs without detouring through layers of menus—they'll simply appear when he needs them. Today, he'll speed right past the traffic jam of inefficiency.

Microsoft<sup>®</sup> Office XP, with <u>smart tags</u> that let you get more done, more quickly. Just one of many improvements in this, the new version of Microsoft Office.

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office xp

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Microsoft

hood. Suddenly the deal doesn't look so magnificent. But in many cases if you end the service contract early, you'll have to pay a large penalty or return the rebate.

The good news is, the Federal Trade Commission and other consumer protection organizations have noticed and are taking action against rebate offenders. Last year the FTC warned traditional and online retailers that it will closely monitor rebate offers. The commission also reminded manufacturers and retailers that the company advertising a rebate—not the firm hired to fulfill it—is legally re-

PRIVACY WATCH

### Who's Snooping on You?

YOUR ONLINE LIFE is an open book.

If you believe otherwise, think again. Every time you sit down at your PC and connect to the Internet, you add another drop of data to the vast information archives that are compiled about you by virtually every entity on the Web.

Sometimes the entities don't even know they're collecting the information. In June, a report by Department of Defense investi-

gators revealed that more than a quarter of the DoD Web sites sampled have no posted privacy statements and may still collect information about visitors, despite three previous directives to remove invasive cookies and Web bugs from federal government sites.

And as if that snafu weren't bad enough, the Defense Depart-

ment sites may inadvertently have permitted civilian companies to obtain and later sell usage data the sites collected.

These oversights prove how pervasive snooping is-even the snoopers can't stop themselves. And once private information falls into the hands of brokers, Web surfers lose all control of their data.

We live in a society that's free but governed by rules. On the Internet, though, the sponsible for the program. Since then, the FTC has brought charges of deceptive advertising against a number of companies, including Buy.com, ValueAmerica, and Office Depot.

In April, New York's state attorney general settled a deceptive advertising case against CompUSA for failing to clearly disclose the terms of a rebate offered by a now-defunct subsidiary. And in March, Florida filed suit against America Online's CompuServe for failing to deliver promised rebates in a timely manner.

Of course, when companies follow **>** 

rules for how people, businesses, and governments interact aren't always clear, and some of the rules aren't always obeyed. The risks to personal privacy are enormous.

That's why in April 2000 we launched the Privacy Watch column on PCWorld.com. The response from readers was enormous. Which is no surprise: Threats to our privacy could have long-lasting implications for areas of our lives well outside

> the glow of our computer screens.

Now Privacy Watch will be appearing in the pages of this magazine each month. What can you expect? Reports on the truth behind privacy policies, the latest ways sites are snooping on you, and what data your own software may be sending outsiders. I'll also write

about the latest tricks hackers may be employing to steal your files or mess up your system. Finally, I'll arm you with information that you can use to secure your PC and protect your personal data.

PC World thinks this is a battle well worth fighting-and you can help. If you see a privacy threat we should write about, e-mail me at privacywatch@pcworld.com and I'll take up the cause. -Andrew Brandt

#### Office XP. A major change to a major part of how you work.

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• Document Recovery is designed to automatically save your work if an application crashes.

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•Type a few letters of an e-mail address you regularly use, and <u>Auto-Suggest</u> will complete it for you, whether it's in your address book or not.

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#### CONSUMER WATCH

the rules, rebates can be a great deal for consumers. So if you decide to play the rebate game, here are some tips to help you come out ahead.

• Don't base a purchase decision on a rebate offer. Consider your needs, preferences, and budget before the rebate.

• Check the expiration dates on rebate coupons and ads. Brick-and-mortar retailers don't always remove expired promotional material promptly. If you're shopping online, check the Web site of the company offering the rebate, or visit a site like Rebateplace.com or RebateCatcher. com for the current offerings.

• Follow the instructions on the rebate form exactly. If you make a mistake or omit information, your chances of getting a check might go into the wastebasket.

• Make copies of everything you send. You'll need those documents if you have to fight for your money.

• Keep track of all dates, including when you mailed the request and when the check is due to arrive. (For hefty rebates, you may wish to send the application via certified mail.) A company called Six International offers a free downloadable utility it calls Rebate Rebate (available at find.pcworld.com/10880) that can help you track multiple rebates.

• If the check is late, call or write to the company. Include copies of all supporting documentation. If the product manufacturer refers you to another company, make sure you continue to copy all correspondence to the manufacturer—since it is ultimately responsible for the rebate.

• If all else fails, write to the FTC and your state's attorney general. Include all dates, copies of documentation, and records of communications between you and the offending company.

We consumers shouldn't have to hound companies to follow the rules of their own rebate game. But until they learn to play fair, we need to let them know that we're paying attention and that we expect them to live up to their promises. We shouldn't tolerate anything less.

Anne Kandra is a contributing editor, Andrew Brandt a senior associate editor, and Grace Aquino an associate editor for PC World. HP Color LaserJet 8550

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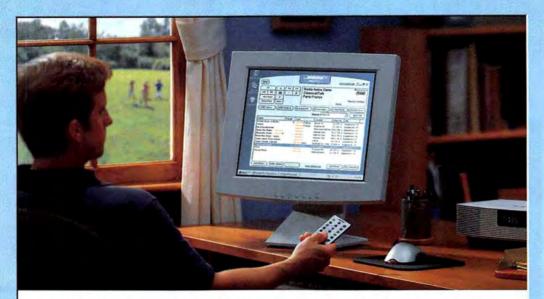
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> It's as easy as using the remote.

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To truly enjoy the variety of music you'll have access to, you need to hear it through a greatsounding music system. That's why the Wave/PC™ combines the power of your computer with the high-fidelity sound of acclaimed acoustic waveguide technology. So whether you're listening to Internet radio, MP3s or

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## Don't Call Us-Ever

## What ever happened to real live customer service representatives?

WE AT PC WORLD have always advised readers not to shop at a Web store that does not prominently list a phone number. Not only does the number mean the business is likely to be legit, it's also convenient when you have one of those "Ohmigosh, did I just order 100 Talking Tinky Winky Teletubbies?" moments.

So as my first act as I take over this column, let me tell you the toll-free number for calling Amazon.com's customer service—800/201-7575—because even with a compass and a map, you may not be able to find it on Amazon's site.

Recently I ordered a nonstick pan from the online giant. It arrived with a big dent. In the past when I had a problem with an Amazon shipment, I called, and a reassuring voice told me everything would be all right. But this order's packing slip didn't list a phone number.

I went to Amazon's site and couldn't find the phone number anywhere. Eventually I e-mailed customer service. I received a speedy reply with the number—but only because I'd asked for it.

So were we wrong to warn readers to

#### GIMME FIVE

### **Best Home Improvement Sites**

 Better Homes and Gardens: New to remodeling? No problem. Most people in the Home Talk section are looking for good advice-and finding it. www.bhg.com
 Home Repair Stuff: One person's nononsense opinions on products, plus links to FAQs, helpful articles, and more. www. factsfacts.com/myhomerepair

3. BobVila.com: Great Web site for do-ityourselfers. Lots of discussion and expert look for phone numbers at Web sites? Many sites, Amazon especially, have excellent online tools for resolving problems. But surely there are major sites that encourage personal communication. To find out, I asked Jupiter Media Metrix for a list of the most-visited e-commerce

sites and tried searching for phone numbers. Here's a sampling of what I found. Amazon.com: Turns out they give you the number only when you're checking out. Unless you write it down or print the page, you'll be at a loss if you need it later. Barnesandnoble.com: Eureka! Click the Help link, then Contact Us—and you'll find their toll-free customer service number at the bottom of the screen.

Half.com: Despite claiming "Customer service is the heart of our business," this discount site (a division of EBay) doesn't list a telephone number.

**X10.com:** These folks sell those wireless Webcams via omnipresent online ads. To

opinion, but probably more detail than amateurs need. www.bobvila.com

4. DoltYourself.com: Topics galore, plus illustrated how-to's and animated tutorials courtesy of partner site Easy2.com. www.doityourself.com

5. Fine Homebuilding Online: The online forums are just okay, but the articles from *Fine Homebuilding* magazine are terrific. www.taunton.com/fh



the company's credit, a toll-free number and a cheery invitation to "Call Anytime" are emblazoned on its home page.

An unscientific study—but what gives? I refuse to believe that phone-based service has no place on the Web.

"Customers have asked us to provide more self-service tools online," says Bill Price, Amazon.com's vice president of global customer service. "As long as they're online browsing or making purchases, they want to check their account, change settings, and track shipments."

But this customer wants to talk to someone, I tell him. Price explains that even before Amazon removed the customer service number from its packing slips (to steer even more people online, he concedes), only a fraction of customer inquiries were done over the phone.

Don't get me wrong. We should all try Web-based help. Maybe even send a test e-mail to see how quickly the company responds. But until online support works as well as a human, sites should make it easy for us to call. If they don't, it's time to hunt down those toll-free numbers and share them with your friends.

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





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## Helpful Tools for Tortured PC Prose

SAY, HAVE YOU HEARD the new slogan for the International Dyslexia Association? (Drum roll, please.) "Dyslexics of the world, untie!" Hilarious, especially if you are one. And I am, mixing up words, letters, and sometimes colors. So I rely heavily on a handful of neat utilities that watch for errors I make in e-mail, memos, and this column. They aren't just for the spelling-challenged, though. Anyone burdened with English as a native language (or as a second or third language, come to think of it) will find these tools useful.

The writing utility that I get the most mileage from is Fanix Software's \$30 As-U-Type. Yes, it's a spelling checker, and no, I haven't lost my marbles. Shelling out money for a feature that's already built into most text-processing products may sound like lunacy, but As-U-Type's features give me an edge in nearly everything I do on a computer.

As-U-Type's autocorrect feature instantly fixes the spelling errors I make every place I type words: chat rooms, forms on Web pages, Internet forums, accounting apps, and dialog boxes in any program.

Some of As-U-Type's tricks are similar to Word's AutoCorrect features. For instance, when I'm frantically typing a

As-U-Type

\*\*\*\*\*

WordDog

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Technologies,

WordWeb Pro

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www.worddog.com

www.asutype.com

List: \$30; Fanix Software,

List: \$25; Plain English

List: \$18; Antony Lewis,

www.wordweb.co.uk

mile a minute, As-U-Type corrects any words that have two initial capital letters instead of just one. And it can transform specific letter sequences into phrases, so when I e-mail my editor, I only have to type the letters *ila* to tell him "I'm late again, but we had this blackout, see, and the dog ate my UPS." (By the way, As-U-Type imports Word's existing AutoCorrect list. If you use



### These handy tools would make your ninth-grade English teacher beam.

Word's AutoCorrect, turn it off when you use As-U-Type, to prevent conflicts.)

As-U-Type is so smart that it can track not only common mistakes—spelling *receive* as "recieve," say—but also misspellings that are beyond belief. An example? Thanks to As-U-Type, you can forget

about being embarrassed by typing "imbearissed," "embraissed," or "emgarrassek."

Another of my favorite utilities is WordWeb, which contains a free thesaurus and dictionary that surpass those in Word by a long shot. Word-Web can check a word for antonyms as well as synonyms, and it also lists similar words and whether the word can be used as a noun, verb, adjective, or adverb. You can install it as a Word toolbar or use it as a stand-alone tool when you're writing e-mail, for example. The \$18 WordWeb Pro version adds wordfinding and anagram features.

#### WEBSTER'S ON THE WEB

SPEND A LOT of time on the Net? A better choice may be Merriam-Webster's dictionary-and-thesaurus link for your browser. Simply go to find.pcworld.com/10985, choose your browser, and follow the easy installation instructions. Once the Dictionary button is on your browser's toolbar, you can highlight a word on a Web page and click the button to see the word's definition. Or select the Dictionary button and enter a word you want defined.

You probably know that someone (often everyone) at *PC World* checks my columns for errors. I still go through them with a fine-tooth comb of an editing program from Plain English Technologies called WordDog (dumb name, smart program). WordDog improves my prose by suggesting tighter phrases, removing unneeded words, and offering alternatives to clichés. This program will make anyone's writing look more professional.

All four tools work with all versions of Windows, and all but the Merriam-Webster Dictionary Lookup Button are available at PCWorld.com's Downloads.

Okay, one more one-liner: Did you hear about the agnostic insomniac dyslexic? Every night, he lies awake in bed wondering if there really is a dog. (I promise: next month, no jokes.)

Find files mentioned in this article at www.pcworld.com/downloads. PC World Contributing Editor Steve Bass runs the Pasadena IBM Users Group. Sign up for his Home Office newsletter at www.pcworld. com/bass\_letter. You can write to him at steve\_bass@pcworld.com.



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## Money Messes From Microsoft, Intuit

DO YOU FEEL Excedrin headache number 2001 coming on? If you use Microsoft Money or Intuit's Quicken or QuickBooks, you might.

The first snag, identified by bug-tracking firm BugNet, involves a feature in Money

for printing wallet-size checks. The program can produce checks that your payees may decide not to accept—if the check is for a very big amount.

Here's what happens: All versions of Money limit the number of characters you can put on the second payment-amount line (where you spell out

the dollar amount in words). At Money's default type size (12-point Courier) the limit is 60 characters. Naturally, you'd have to plug in a really long number to reach that limit, but the problem could affect you if you wrote a check to cover a large stock transaction or to make a payoff on your house. Once you use up the space on this payment line, Money starts printing numbers instead of words. You see the numerals only after you print your check—you can't see the conversion on screen. Some payees may overlook the gibberish, but others may refuse to honor your check.



One way around the limit is to choose a smaller type size before printing. To do so, select *File-Printer Setup*, choose the *Font* tab, and then set a point size of 11 or smaller. Check out Microsoft's explanation of this problem at find. pcworld.com/10680.

BugNet also discovered a difficulty with Intuit's Quicken. If you try to transfer your

#### WINDOWS 2000 UPDATE LOCKS OUT LOGITECH

LAST MONTH I wrote about the release of Service Pack 2 for Windows 2000 (see find.pcworld.com/10687). Even though the service pack is supposed to fix roughly 500 problems, it's created a new one for users of Logitech mice. After installing SP2, Logitech users can run into all kinds of trouble, including the dreaded "blue screen of death." Logitech reports that the service pack and its MouseWare driver are in conflict. Logitech spokesperson Nathan Papadopulos advises Logitech-mouse customers to download the latest driver update, MouseWare version 9.29-before installing SP2, if possible. Get the update at find.pcworld.com/10688. Quicken files to Microsoft Money (any version) and you run into an "illegal operation" message, be careful. The odds are that you have a corrupted Quicken file. A way to fix the snafu is to first pull out each account in the Quicken file by

> copying and saving each one to a new Quicken Interchange Format (or QIF) file. Then import these QIF files into a new Money file. This will dispose of the corrupted file permanently. For more info, visit find.pcworld. com/10960 or call Intuit at 800/952-2558.

The third glitch occurs in QuickBooks 2001: If you use this application and have run into the error message "QBW32 caused an IPF in module APPCORE. DLL," you have a conflict between Quick-Books and your graphics card driver, Intuit says. Quick-Books can't deal with any graphics card driver that supports two monitors at once, and the program won't run.

You can either disable the dual-monitor driver temporarily, or prevent it from loading altogether when you reboot your PC. The workarounds will prevent you from running two monitors, but neither will disable your video card entirely. Get the instructions at find. pcworld.com/10681.

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

#### IN BRIEF

#### Weakness in Word

MICROSOFT recently discovered and plugged a serious hole in Word 97, 2000, and 2002 for Windows, and in Word 98 and 2002 for the Mac OS. The flaw, which relates to Word's security checking for macros, lets clever hackers craft Word macros that allow them to run without asking your permission. Once the macro infiltrates your system, the hacker can then do anything you can do on your PC-even reformatting your hard drive. For the patch, go to find.pcworld.com/10685.

#### Patch for Microsoft NetMeeting

LAST OCTOBER, Microsoft fixed a security hole in Net-Meeting. Almost a year later, the company announced a variation on the glitch that affects users with "remote desktop sharing" turned on. NetMeeting 3.01 running on Windows 2000 or NT 4.0 is susceptible. Find the details on the flaw and the patch at find.pcworld.com/10686.

#### BUGGED?

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

## **PORTABLE COMPUTERS:** Enhancing Mobile Work Styles

#### BY ED LUKENS

Consumers in the market for a new computer are increasingly thinking portable. As portable prices and technology have become more competitive with desktop models, this sector has grown. In fact, since the beginning of 1999, U.S. sales of portables have grown at 3.1% annually, nearly twice the rate of desktop models.<sup>1</sup>

And portable computers are changing the way we work. To find out how, we interviewed four Win-Book users.

#### **ROGER BLACKWELL**

Roger Blackwell is a Professor of Marketing at The Ohio State University and president of Roger Blackwell Associates. A pioneer in the field of consumer behavior, Blackwell works with many of the world's largest companies.

"I'm traveling much of the time, so my WinBook is a necessity. I use it for the courses I teach, e-mail, PowerPoint presentations, and writing my books," says Blackwell. "I wrote all five on my portable."

Since Blackwell often travels internationally, excellent battery life is important. WinBook's new WinBook Z1 series carries two batteries and can provide eight hours of uninterrupted service.

#### **ERNIE IRVAN**

NASCAR legend and Irvan Enterprises president Ernie Irvan purchased his WinBook to use while traveling to races with his family. "The kids could play games, we could do some statistics for the races, and we could watch DVD movies on the big screen. Sometimes we even hooked it to a large-screen television," says Irvan.

Irvan uses WinBook laptops throughout his business, using its built-in Ethernet to facilitate networking. With the WinBook, the company can add music, commentary, and text to race images and thus replace custom-built workstations and cut the time required to produce images for television and the Internet.

WinBook now offers combination DVD/CD-RW drives on each of its three product lines so that users can create CDs as well as enjoy DVD movies.

#### MARK HAASE

Attorney Mark Haase finds portable computers invaluable for training, research, briefs, and documents. "My WinBook is helpful at law libraries and for trademark research and negotiating contracts," says Haase.

Nearly all today's portables include 56-kbps modems, and many also offer wireless Internet access and wireless networking. "I regularly use the WinBook for research, document transmission, e-mail, and contract management," Haase notes. He can also create forms and bill clients while traveling.

In 1993, when Haase was a federal administrative law judge, he was among the first to try portable computing in the courtroom. "I used a WinBook to retain files, prepare case summaries, and draft instructions to staff, and I also used it from the bench during hearings."

#### MICHAEL DAILEY

Attorney Michael Dailey is a partner with Atlanta-based Anderson Dailey,



LLP. "I use my WinBook constantly. I take it home every night to catch business e-mail messages and keep up with friends," he says. "It's quite cool, fast, and the big screen gives attractive presentations.

"I use my WinBook for calendaring, and I can archive my e-mails by client with Microsoft Outlook. I use Microsoft Word for client files and documents," Dailey adds. "Sometimes I bring my WinBook into the courtroom, where I can access briefs, memoranda, and previous citations."

Dailey appreciates the ruggedness of portable computers in a way few can. He ran over his first Win-Book with his Range Rover. Fortunately, his WinBook survived, and he was able to continue using it for eighteen months before he upgraded to a new model.

 About the author: Ed Lukens has served as Marketing Manager for WinBook since 1993. He holds an MBA from The Ohio State University and has served there as a member of the faculty.

"How Portable PCs Are Cutting into the Hegemony of Desktop PCs," by Alan Promisel, International Data Corporation, March 2001.

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## Your High-Tech HOME AWAY FROM HOME

his may sound nuts, but Jeff Naticchia still looks forward to going away on business. As a marketing manager for a leading cable TV magazine publisher, Naticchia gets to visit a different U.S. city every month. And despite flight delays and cancellations, crabby car rental clerks, and half-crazed airport cabbies, "it's still nice to get out of the office from time to time," he says.

Naticchia may be more patient than many of his fellow travelers, however. Forty percent of mobile managers witness an incident of "air rage" each year, according to a reable sometimes, it's hard to get any work done."

#### BETTER THAN MAGIC FINGERS

Once you're out of the airport, things may get better. Major hotel chains now routinely offer the business travelers state-of-the-art technology. Guests at the Hyatt Hotels and Resorts, for instance, can access the Internet through data lines in their hotel rooms, and Hyatt plans to furnish all of its meeting rooms with T1 lines by the end of 2001.

Unfortunately, many hotels charge too much for their Internet



InFocus's LP130 portable projector offers great functionality in an ultralight package.

cent OAG business travel survey. Naticchia has seen the tension himself. "When there's a mechanical problem with a plane that's already boarded," he says, "there are always a few people who act as if they'd rather see the pilot just go for it."

Other surveys find more business travelers hunkering down for longer hours in crowded airport lounges and cramped airplane seats. "Even a laptop becomes a liability after a while," Naticchia says. "It's so miserconnections, according to Naticchia. "A lot of hotels now offer high-speed data access," he says, "but that's an expense my company will not reimburse."

Among hotel guests, business travelers are typi-

cally the most overcharged, says journalist and commen-

tator Chris Elliot. "Hotels love to give you one rate — and then add surcharges. They're even charging people for dialing 800 numbers, and they're applying energy surcharges indiscriminately. You can always look forward to a big surprise at checkout."

Elliott, who writes about business travel at his Web site, www.elliott.org, says hotels don't always deliver on their high-tech promises. He recommends that business travelers carry



No bigger than a laptop keyboard, the LP130 weighs just 3 pounds.

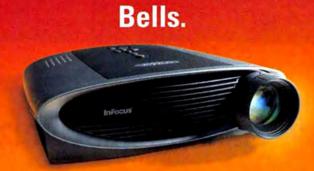
with them an Internet connection kit that doesn't depend on a data line being present in a room. "And always carry a line tester," he says, "because a hotel's digital phone line can fry your modem." Just what you need: another accessory to lug around!

#### LIGHTEN UP

On the other hand, digital projector maker InFocus Corp. has come up with one device that won't put a drag on mobile presentations. The company's LP130 portable projector weighs a lightsome 3 pounds, and is about the size of a laptop keyboard (less than 7 x 9 inches, and just 2 inches tall). Yet the LP130 is a fullfeatured projector, packing DVI connectivity, DLP display technology, crystal-clear 1024 x 768 (true XGA) resolution, and stellar 1100-lumen brightness into its sleek, stylish chassis. Not only that, users enjoy free, 24 x 7 technical support from InFocus for 90 days.

For Naticchia, a device's size, look, and feel are as important as its capabilities. "On the road, I want something I can really move with," he says. "But if I can get both portability and performance in one package, that's even better."

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# NEW PRODUCTS

EDITED BY THE NEWS DEPARTMENT

## Power Play: Sizzling Customized PCs

0

It's a hot configuration that translated into some of the fastest Windows Me performance scores we've seen. The Aurora DDR and the Mach V scored 197 and 193, respectively, on our PC WorldBench 2000 tests, about 20 percent higher than a comparable 1.7-GHz Pentium 4 system such as the \$2279 Dell

Dimension 8100.

In addition, both systems managed admirably on our graphics tests. Our Quake III tests on the two PCs ran at a staggering average of 138 frames per second at 1024 by 768 resolution in 32-bit color. Of course, that kind of performance is to be expected from expensive, custom PCs. But look inside either one, and you'll also discover evidence of painstaking attention to detail. For example, every cable is routed carefully so as not to disrupt airflow. And printed documentation is top-drawer: Each maker offers a customprinted binder holding extra, vendor-specific information.

The Aurora's case deserves mention-the large black enclosure is easy to open and includes features such as four cages for the cooling fans and lever-released drive bays for internal hard drives.

The very sharp 22-inch NEC FE1250+ flat CRT monitor and the Klipsch ProMedia 5.1 500-watt THX speakers make great additions to a loaded sys-

FAST AND FASHIONABLE: Alienware's Aurora DDR gaming PC.

> GAMING PCs TEST WHEN IT comes to PCs, gamers always want the absolute coolest accoutrements: cavernous cases, lightning-fast graphics boards, and speakers that offer hometheater-quality sound. Alienware and Falcon Northwest make their living by blending components like these into the fast PCs that gamers love.

> But hey, any system that has enough processing muscle to

handle hard-core gaming is also going to be one fast box. So we tested two such systems (both 1.4 GHz): Alienware's \$3599 Aurora DDR, and Falcon Northwest's \$3195 Mach V.

Each system carries a list of impressive specs: a 1.4-GHz Athlon processor, 256MB of DDR SDRAM, a 16X DVD-ROM drive, a graphics card featuring NVidia's GeForce3 chip, and Plextor's reliable 16/10/40A CD-RW drive.

FALCON Northwest's powerful Mach V.

PHOTOGRAPHS: MARC SIMON

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  - PERSONAL DIGITAL ASSISTANT Sony Clié PEG-N710C PRINTER
  - Samsung ML-1210 ACCOUNTING SOFTWARE Peachtree Complete Accounting 2002

tem. The Aurora also is very stylish, with case and peripherals all in sleek black.

Falcon Northwest's Mach V feels slightly less inspired due to its merely adequate Optiquest Q95 monitor and plain beige case. (Falcon does offer optional superior monitors.) But the Mach V is every bit as loaded as the Aurora, starting with a sound system powered by Klipsch's ProMedia 4.1 speakers and Hercules's Game Theater XP. Its more-compact case should work better in space-constrained situations.

If you have the cash, either system can more than handle your computing and gaming needs. For my money, I'd take the Alienware's added style. That is, if I had the money. -Eric Dahl

Aurora DDR

#### Alienware

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An expensive, well-designed, no-compromises gaming and power machine. List: \$3599 find.pcworld.com/11081

#### Mach V

Falcon Northwest ★★★★

A powerful, full-featured gaming PC, though its looks are a bit ho-hum. List: \$3195 find.pcworld.com/11082

## NEC's Long-Lasting Laptop

72

ALMOST coast-tocoast battery life is possible from the Versa UltraLite.

NOTEBOOK THE NEW Versa Center UltraLite notebook from NEC weighs a scant 3 pounds, has a crisp, easy-toread screen, and claims to provide up to 5 hours of battery life on a single charge. The notebook also comes equipped with a 20GB hard drive, 128MB of RAM, and Windows 2000. So, you're thinking, what's the catch?

There are a few gotchas. If long battery life is what you prize the most, however, our examination showed that this \$2499 notebook's performance is good, though not quite as good as the upto-5-hour figure claimed. In our tests, the notebook's battery lasted 3 hours, 9 minutes when the system was set at full performance and 4 hours, 7 minutes with automatic power saving enabled. And don't be put off by the notebook's seemingly piddling PC WorldBench 2000 score of 85. The UltraLite uses a Transmeta Crusoe 600-MHz TM5600 CPU (as well as lithium ion and lithium polymer batteries) to achieve its longer battery life. Unlike PCs using Pentium III chips with SpeedStep technology-which lowers CPU performance to a single preset speed, such as from 750 MHz to 550 MHz -the Crusoe dynamically adjusts processor speed according to the function the PC is currently performing.

The result of this powersaving maneuver is slower performance—significantly lower numbers when compared with the PC World-Bench 2000 scores (140 to 160) commanded by Pentium-based competitors that we have tested.

One thing I did find offputting about the shipping unit I tested was its keyboard: It had little give and was poorly laid out. The <Backspace> key was located directly above the <Enter> key, and the <Ctrl> key was tiny, whereas the infrequently

used <Windows> key was full size. While the modem port is integrated,

modem port is integrated, the ethernet and external monitor ports are located on included (but inconvenientto-use) dongles. And since this notebook has only an integrated monaural speaker, you'll need headphones to listen to CDs on the 10X– 24X CD-ROM drive.

Despite all those shortcomings, the Versa Ultra-Lite's petite size and weight, 10.4-inch active-matrix XGA (1024-by-768-inch) screen, significant battery life, and reasonable power for business applications make this notebook worth a look by any mobile professional.

-Michael S. Lasky 🕨

## Versa UltraLite

#### \*\*\*\*

Anyone who values extremely long battery life and light weight in a notebook will find this a good choice. List: \$2499 find.pcworld.com/10943



## Small Wonders: Powerful, Pocket-Size Cameras

#### DIGITAL CAMERAS

CONVENTIONAL wisdom has it that the smaller you make a device, the more you have to compromise performance and features. But a trio of stylish new digital cameras available from Canon, Kyocera, and Nikon appear to defy that maxim. We looked at shipping versions of all three.

Let's start with the Canon PowerShot S110 Digital Elph. This compact yet solid camera has a 2X optical zoom and a 2.1megapixel charge-coupled device (CCD). The Elph fits nicely in a shirt pocket and weighs about as much as an average grapefruit. Although it looks like its predecessor, the S100, it offers some new perks.

through the Elph's video port or download clips to a computer. And the camera's buttons and menus make changing the settings simple.

The S110 we tried out adds an image resolution option of 1024 by 768, perfect for balancing quality and image size. Alternatively, you can select 1600 by 1200 or 640 by 480. For storage, the S110-like the Nikon Coolpix 775-packs an 8MB CompactFlash card.

The Elph captured goodquality images overall on its default settings. Most of our shots were bursting with color, but a few lacked detail. Still, the \$599 Digital Elph is reliable and easy to use.

Kyocera Optics' diminu-



THE TINY Kyocera Finecam S3 could easily get lost in your backpack.

It allows you to record video with audio in a 10-second clip at 320 by 240 resolution, for example. You can also pipe the video (or photos) to a TV

#### **Canon PowerShot S110 Digital Elph**

#### Canon

\*\*\*\*\*

The compact and solidly built Elph can capture video with sound, but it's pricey for its class. List: \$599 find.pcworld.com/10941

your biggest worry may be losing it in the bottom of your carry bag. Yet it has some impressive features, including a 3.34-megapixel CCD and a 2X, 38mm-76mm optical zoom

A great choice if you like to travel

light or are a serious photographer

who wants to keep a small, quick-

shot camera handy. List: \$699

find.pcworld.com/11084

Kyocera Finecam S3

**Kyocera** Optics

\*\*\*\*\*

#### NIKON'S Coolpix 775 and Canon's S110.

G-27

lillion

lens. It's also the first camera we've seen that uses Secure Digital media, a 16MB wafer the size of a postage stamp.

#### SIZE MATTERS

SMALL CAMERAS can be awkward to use, especially for people with large hands. But the \$699 S3's nicely grouped controls and dedicated buttons make changing the settings a relatively quick and easy process. There's one button for the four flash modes, and another for switching to extreme closeups. You can easily set everything else through the circular four-button thumb pad and the menus.

Extracting images from the S3 is a bit different-there's no USB port. Instead, you get a small USB card reader for the Secure Digital media. Our test shots were attractive, with generally good detail.

Finally, the Nikon Coolpix 775, with a 2.14-megapixel

#### Nikon Coolpix 775 Nikon

\*\*\*\*

The affordable Coolpix 775 offers a 3X optical zoom and doesn't weigh much, making it a great value. List: \$450 find.pcworld.com/10920

CCD and a 3X optical zoom lens, carries on the Coolpix family tradition of earning favorable PC World reviews, as a result of its reasonable price and easy-to-use controls.

call of the second second

The 775 lets you choose from eight different presets to match the environment of your snapshot (such as landscape, portrait, or sunset). If you prefer, you may let the camera do all the work on Auto. The 775 can record up to 40 seconds of video without sound at 320 by 240 resolution. Though a bit chunkier than the Digital Elph, it's also lighter, weighing about the same as a medium-size apple.

#### **COLOR-RICH PHOTOS**

THE COOLPIX 775 captured color-rich, photographs at 2.1megapixel resolution; but at default settings, some images were flawed. You can improve results by tweaking exposure and white-balance settings.

For \$450, you get a reliable camera with extras such as rechargeable batteries. It's a good value for first-time users. -Grace Aquino

and Tracey Capen 🕨

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MHz/GHz only measures microprocessor internal clock speed; many factors affect application performance. \*System includes chipset that uses some main memory for the video subsystem. The amount used will vary depending on video mode and may be as much as 8MB. Thus, accessible system memory is less than the amount stated. 'GB equals one billion bytes when referring to storage capacity; accessible capacity may be less. 'CD-RW, DVD-ROM and CD-ROM drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible. Actual CD-RW, DVD-ROM and CD-ROM speeds will vary and are often less than the maximum possible. The read and write results of the CD-RW drive depend on the quality and characteristics of the CD-R and CD-RW media used. Poor results may be obtained with some media suppliers. Some software may differ from its retail version (if available), and may not include user manuals or all program functionality. For non-IBM software, applicable third-party licenses may apply. Warranty, service and support for non-IBM products, if any, are provided by third parties, not IBM. IBM makes no representations or warranties regarding non-IBM products. For terms and conditions or copies of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the US and in Canada call 1 800 426-2255. Telephone support may be subject to additional charges. For warranties including onsite labor, customer may be asked certain diagnostic questions before a technician is sent. 'Pricing shown is price available from IBM directly. Reseiler prices may vary. IBM price does not include tax or shipping and is subject to change without notice. 'SuccessLease is offered by third-party providers of business financing approved by IBM Global Financing. SuccessLease terms and conditions provided by the third party. Featured monthly lease payments include prespecified purchase option at end of lease, to qualified business customers only, installing in the US. Documentation fee and first month's payment due at lease signing; taxes are additional. Offer may be withdrawn or changed without notice. Options cannot be leased separately. 'Certain Microsoft' software product(s) 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). IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM cannot be responsible for photographic errors. SuccessLease and all IBM product names are registered trademarks or trademarks of International Business Machines Corporation. Lotus and SmartSufe are registered trademarks of Lotus Development Corporation, an IBM company. Intel, the Intel Inside logo and Pentium are registered trademarks 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.





IBM NetVista X40

TEX

## **On-the-Go PC Storage**

STORAGE

YOUR PC's hard drive may be big and fast, but it lacks an attribute required for today's on-the-go lifestyle: portability. New external drives from Iomega and Maxtor provide that quality, as well as speed, size, and flexibility, but at a price. Before Maxtor's new 60GB Personal Storage 3000DV, exter-

#### MAXTOR'S Personal Storage 3000DV.

nal IEEE 1394 (FireWire) hard drives had always been plugand-play handy, but their performance lagged behind that of SCSI drives and internal IDE models. The Maxtor, however, writes data at a blazing 16 megabytes per second nearly double the speed of previous IEEE 1394 drives. Its sustained read rate of over 8.5 MBps while copying data to a half-full hard drive was quite impressive, too.

Alas, with 60GB internal IDE drives costing as little as \$150 at retail, the \$380 Maxtor is hardly the cheapest way to add capacity to your system. But the drive, surge-protected by the IEEE 1394 bus, makes an excellent backup or videoediting drive, and it's ideal as a shared resource in a smallor home-office environment.

The Maxtor drive measures

6 by 8.6 by 1.6 inches (width by depth by height), and it weighs about 2 pounds and is rugged enough to take lot of handling. The drive draws a bit too much juice to run solely off IEEE 1394 bus power, so an AC adapter is required. But my only real gripe is that the drive lacks a power switch.

If you want something that is easier to carry around, Iomega's Peerless removable hard drive cartridge system could be just the ticket, albeit a rather high-priced one: \$360 for the drive itself plus a single 10GB cartridge. Peerless cartridges weigh just under a pound and are only 3.5 by 5.3 by 0.7 inches in size (width by depth by height). Unfortunately, additional 10GB cartridges cost \$160 and 20GB cartridges run \$200which makes for a pretty hefty dollar-per-megabyte ratio.

But the extra cash buys you a strong combination of reliability and storage in a removable cartridge drive. Peerless cartridges are hermetically sealed to keep out contaminants. Iomega says that they're also far more shock resistant than competing drives.

Peerless cartridges fit vertically inside a docking sleeve that uses a removable connectivity module (either USB or IEEE 1394) as its base. Only the USB module was available for my testing, so the fastest transfer rates I saw were 950 kbps for writing and 750 kbps for reading. Those are speedy times for a USB 1.1 device, but the company claims that the upcoming IEEE 1394 module should multiply those rates by at least a factor of 20.

#### Peerless

- lomega
- \*\*\*\*\*

Durable cartridges good for those on the go, but a high price and slow USB connection will deter many. List: \$360 (drive, one cartridge) find.pcworld.com/10942



THE PEERLESS system from lomega.

In my opinion, however, most users' backup needs will be better served by cheaper technologies like CD-RW. –Jan L. Jacobi

\_\_\_\_\_

Personal Storage 3000DV Maxtor

\*\*\*\*:

This fast and rugged IEEE 1394 (FireWire) drive lives up to the technology's name, but you'll pay plenty for it. List: \$380 find.pcworld.com/11300

## Make Move to a New Computer Easier

U T I L I T Y YOU CAN SPEND THE better part of a week figuring out how to make a new PC behave like the old one. V-Communications' \$50 PC Upgrade Commander, a utility for transferring your programs, data, and configurations to a new com-

#### PC Upgrade Commander V Communications

\*\*\*\*\*\*

Eases the task of moving data and programs to a new PC. List: \$50 find.pcworld.com/10940 puter, makes the chore easier.

You install and run PC Upgrade Commander on both computers, click through a short and simple wizard, and let the program transfer your files over a LAN, through the included parallel cable, or via removable media drives.

Though Upgrade Commander makes the job easier, it doesn't make it easy—you'll still have to reconfigure many programs. If an application is already installed on both computers, this utility leaves it as it is on the new one; and your old settings, your preferences, and some data may not make the journey. In my tests, running the program gave the new PC's Outlook Express the address book and accounts but not the in-box folders or rules—from the old PC.

Of seven tests, two ended badly. The undo feature did fix the second disaster. The old PC, with all of its valued data and applications, remained unaffected in both cases.

-Lincoln Spector 🕨

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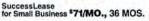
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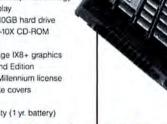
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Based on comparisons with the following models offering a 14.1' display as of 2/15/01: Compaq Armada M700, Dell Latitude C600 and Inspiron 4000, Sony Vaio XG700, Fujitsu Lifebook E series, Toshiba Tecra 8200, Hewlett-Packard Omnibook 6000, Net Versa SXi, Acer TravelMate 520, Micron Transport LT, Winbook and Gateway Solo 5300. "Titanium Composite Carbon Fiber Reinforced Plastic has three times the strength of ABS plastic as tested by IBM using the high flex modulus test on 2/28/00. Available on select models. 'March 2001. 'MHz/GHz only measures microprocessor internal clock speed; many factors affect application performance. For mobile Intel Pentium III processors featuring SpeedStep technology, this denotes maximum performance mode; battery optimization mode is approximately 80% of maximum performance mode. 'GB equals one billion bytes when referring to storage capacity; accessible capacity may be less. "CD-RW, DVD-ROM and CD-ROM drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible. Actual CD-RW, DVD-ROM and CD-ROM speeds will vary and are often less than the maximum possible. The read and write results of the CD-RW drive depend on the quality and characteristics of the CD-R and CD-RW media used. Poor results may be obtained with some media suppliers. "For non-IBM software, applicable third-party licenses may apply. Warranty, service and support for non-IBM products, if any, are provided by third parties, not IBM. IBM makes no representations or warranties regarding non-IBM products, 'For terms and conditions or copies of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the US and in Canada call 1 800 426-2255. Telephone support may be subject to additional charges. For warranties including onsite labor, customer may be asked certain diagnostic questions before a technician is sent. Warranty does not include ThinkPad battery, which is covered by a separate, one-year limited warranty. Pricing shown is price available from IBM directly. Reseller prices may vary. IBM price does not include tax or shipping and is subject to change without notice. SuccessLease is offered by third-party providers of business financing approved by IBM Global Financing. SuccessLease terms and conditions provided by the third party. Featured monthly lease payments include prespecified purchase option at end of lease, to qualified business customers only, installing in the US. Documentation lee and first month's payment due at lease signing; taxes are additional. Offer may be withdrawn or changed without notice. Options cannot be leased separately. "Certain Microsoft" software product(s) 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). "This product is manufactured for and distributed and sold by BetestyMotion Systems. IBM, the IBM logo and IBM trade dress are owned by International Business Machines Corporation and are used under license from IBM. IBM does not manufacture this product and provides no warranty or support for this product. Please contact Betest/Motion Systems for all questions/comments and service or support related to this product. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM cannot be responsible for photographic or typographic errors. SuccessLease and all IBM product names are registered trademarks or trademarks of International Bus ness 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 and SpeedStep are trademarks 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.





## Sleek and Chic, the iBook Grows Up

#### NOTEBOOK

CARRYING AN Apple **Book** is a bit like holding a baby: People stop to admire it. The new model's white-on-white case and its diminutive size (slightly larger than a piece of typing paper and only 1.35 inches thick) make this portable hard to resist. Unlike the earlier, candy-colored iBooks, however, this baby is packed with business-class hardware.

The \$1799 shipping model that I looked at comes with a

#### iBook

Apple Computer \*\*\*\* A very portable and affordable laptop, with a great look and enough power to do serious work, List: \$1799

find.pcworld.com/10841

500-MHz PowerPC G3 CPU and with both Mac OS X and 9.1 installed (it starts up in the latter by default). Its 128MB of RAM are plenty to run general productivity apps, such as Microsoft Office, in OS 9.1; if you allocate enough virtual memory to graphics-intensive apps such as Photoshop Elements or IMovie, it can handle those, too. It just meets the required amount of memory to run OS X, however.

The 10GB hard drive won't store many movie files—you'll have to burn them to CD with the included combination DVD and CD-RW drive, or hook up an external drive via the IEEE 1394 port or either of two USB ports. The 12.1-inch screen is quite viewable, especially at 1024 by 768 pixels (although its letters have softer edges than I like). DVD movies play smoothly, but the sound from the two small speakers is tinny and weak.

The iBook comes with a few graceful touches, such as the battery-life indicator on the back of the case. But I found some other details annoying, especially the fragile-feeling keyboard—which lifts off to let you insert an optional wireless card or extra RAM. In addition, the lid's hinge seems both stiff and insubstantial, and the screen jiggles when you touch it.

Despite these drawbacks, Apple's iBook offers powerful components, portability, and a price well under \$2000—all in a case that turns heads.

-Rebecca Freed

BRAWN AND BEAUTY: Apple's new iBook.

## Siemens S40: Call Locally, Tote Globally

#### CELL PHONE

WANT A USEFUL phone that makes an excellent traveling companion? Try Siemens's lightweight, stylish S40. At 3.4 ounces, this silver-and-gray phone works on 900-MHz, 1800-MHz, and 1900-MHz GSM bands in Europe, Asia, and the United States. Using it was easier than ordering escargots at a Paris café.

#### **S40**

#### Siemens

(Preproduction unit, not rated) Automatic network switching, small size, and excellent reception make this phone great for international business travelers. List: \$379 find.pcworld.com/11261 My calls to the United States from Paris, as well as calls locally in both places, always sounded crisp and clear.

When the phone's network selection mode is set to manual, you are prompted to select a network. When set to automatic, the phone will not only choose the network in range with the strongest signal, but will also seamlessly and automatically

NO EXTERNAL ANTENNA makes the S40 easy to carry or to pack for trips. switch if it finds one with a clearer signal. I tested a \$379 preproduction phone using Cingular wireless service.

Backlit in blue, the S40 includes WAP support, a Dicta-

phone that can record messages up to 5 minutes long, a calendar, a call alarm, customizable ring tones, and an address book, as well as IrDA printing, faxing, and messaging support. Its integrated internal antenna makes it easy to carry, and you can enable the phone's IrDA port to easily beam quick messages or to sync the phone's calendar and address book with your Palm. (However, the unit I tested didn't work with Windows CE.)

You also get a travel charger, a leather carrying case with belt clip, a headset, a user guide, a communication software CD-ROM, and a lithium ion battery that allows for up to 260 hours of standby time and 6 hours of talk time.

One note: This phone is so compact that sometimes I had trouble hitting only one button at a time. Those with large fingers are warned.

I had jet lag when I arrived home, but the phone didn't. When I powered it up back in the United States, it immediately prompted me to switch back to my local network.

-Alexandra Krasne 🕨

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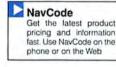
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### **Personal Digital Darkroom**

#### PHOTO PRINTER

TEST CREATING quality Center. prints from a digital camera for the photo album can be painful: Download, edit, print, and pray you don't get a bunch of dots. The \$249 **Epson Stylus Photo 785EPX** takes some of the effort out of that process, creating borderless prints with good color. It's like having your own photo lab-and you don't even need a PC to use the device.

Printing an image is easy. Just insert the camera's digital media card into the printer's built-in PC Card reader, and select the paper size, number of copies, and paper type from the control panel.

If your digital camera uses CompactFlash Type I media,

digital photos without a PC.

P D A

# THIS EPSON prints

adapter. Epson will exchange that for a SmartMedia or Memory Stick adapter if that is what your camera needs. Other adapters are available at additional cost. You can also connect the printer to your computer's USB port; when you do so, the PC Card reader appears on your computer as

you use the included PC Card

a removable disk drive. A typical 4-by-6-inch, highresolution image prints in about 4 minutes. To produce good quality without the assistance of a photo-editing application, the Stylus Photo 785EPX uses its own Print Image Matching function, which embeds settings like contrast, brightness, and color balance in the images taken by any compatible camera.

For testing, I used the Casio QV-3500EX, Epson PhotoPC 3100Z, and Sony DSC-P1 cameras. You should check with Epson for a full list of compatible cameras.

The printer produces decent photos even with cameras that are not compatible with Print Image Matching: however, I did see noticeable improvements in color balance and contrast when this feature was turned on. The images were no more grainy than a print from 35mm film.

The Stylus Photo 785EPX is also great for easily printing small groups of digital photos; the quality and price approach those of prints ordered from a drugstore's photo lab.

-Paul Jasper

#### **Stylus Photo 785EPX** Epson

\*\*\*\*\*

This photo printer makes printing images from your digital camera easy, and it creates good-quality photos for a low cost. Street: \$249 find.pcworld.com/10842

cradle. In my tests, the Clié ran for several days between charges-longer than I'd expected, considering the heavy play that I gave a color game (Bejeweled) as well as all that Memory Stick music.

-Yardena Arar 🕨

GET VIVID VISUALS and great audio from the Clié PEG-N710C.

## New Sony Clié Gets Colorful, Musical

SONY'S NEW Clié handheld adds a high-resolution color screen and a built-in MP3 player to an already sleek and storage-rich product.

At first glance, the \$500 Clié PEG-N710C could be mistaken for a slimmed-down Compag IPaq with its silvery case. Even at the brightest setting, how-

#### Clié PEG-N710C

#### Sonv

#### \*\*\*\*

Fairly priced handheld for those users seeking a Palm-based PDA with a high-resolution color screen and a built-in MP3 player. Street: \$500 find.pcworld.com/10843

ever, the Clié's front-lit, reflective active-matrix screen looks dull compared with the brilliant IPaq's color screen.

But the Clié's 320-by-320pixel resolution looks noticeably finer than the 160-by-160 grid on other handhelds that use the Palm OS-and much nicer for viewing photos and short videos. I also liked the suede-like flip-up lid that protects the screen (and which stays in place with a magnet when it's closed).

The Clié's MP3 player requires inserting a Memory Stick in the slot on top. You need the white version (with copy protection) to use Sony's MG Jukebox software to convert music files to Sony's own high-quality, space-consuming format at 132 bits per second. MG Jukebox does prevent you from transferring copyright-protected songs back to any PC except the one they originally were loaded from. Alternatively, you can transfer MP3 files to a purple Memory Stick. The included clip-on earphones are a bit awkward to wear, but they do deliver good sound quality.

To power all that multimedia, the Clié PEG-N710C uses a lithium ion polymer battery that recharges via the USB-based desktop syncing

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December 2000. 'August 2000. 'MHz/GHz only measures microprocessor internal clock speed; many factors affect application performance, 'System includes chipset that uses some main memory for the video subsystem. The amount used will vary depending on video mode and may be as much as 8MB. Thus, accessible system memory is less than the amount stated. 'GB equals one billion bytes when referring to storage capacity; accessible capacity may be less. 'CD-RW, DVD-ROM and CD-ROM drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible. Actual CD-RW, DVD-ROM and CD-ROM speeds will vary and are often less than the maximum possible. The results of the CD-RW mcfu used. Poor results may be obtained with some media suppliers. 'Some software may differ from its retail version (if available), and may not include user manuals or all program functionality. For non-IBM software, applicable third-party licenses may apply. Warranty, service and support for non-IBM products, if any, are provided by third parties, not IBM. IBM makes no representations or warranties regarding non-IBM products. 'For ferms and conditions or copies of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the US and in include. ThinkPad battery, which is covered by a separate, one-year limited warranty. 'Pricing shown is price available from IBM directly. Reseller prices may vary. IBM price does not include tax or shipping and is subject to change without notice. "SuccessLease is offered by third party providers of business financing approved by IBM Global Financing. SuccessLease terms and conditions provided by the third party. Featured monthly lease apyments include prespecified purchase cannot be leased separately. 'Designed to be capable of receiving at up to 56Kbps with compatible phone line and server equipment, and transmitting at up to 31.2Kbps. Public networks currently limit maximum download speeds to about 53Kbps. Actual speeds depend on many factors and are often teoxing. 'Certain Microsof

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## **Quality Laser Printer, \$199**

P R I N T E R UNLIKE the pricey models aimed at the corporate world, Samsung's latest pint-size monochrome laser printer doesn't require deep pockets. The Samsung ML-1210 delivers pages of crisp, black text, and it costs only \$199—making it the least expensive laser on the market and on a par in price with midrange ink jets.

Easy to set up and operate, the ML-1210 attaches to a parallel or USB port, and, with the help of its no-nonsense installer CD, I started printing within seconds. This model also features some handy options. It can condense multiple pages onto one page for copies of a presentation that your audience can take home, for example.

You can send print jobs out the front of the unit, avoiding the 180-degree turn into the main output slot, which can wrinkle stiff media or even detach labels inside the paper path. You also can import external files, such as a letterhead, to superimpose on your document. You can't, however, replace the 150-sheet paper tray with a larger one.

The ML-1210 turned in a respectable performance (I looked at a shipping unit), but

#### ML-1210

#### Samsung

#### \*\*\*\*

With a small footprint and a small price, the ML-1210 is a great deal for home-office users who want a monochrome laser printer that is easy to set up and simple to use. List: \$199 find.pcworld.com/10844 based on *PC World*'s tests, it's no speed demon. It printed text at 7.1 pages per minute; the fastest home-office laser we've tested—Samsung's ML-6060—hit 9.7 ppm, but it costs about \$300. Like the output of most monochrome lasers, the ML-1210's printouts of *PC World*'s standard test photos were dark and slightly dotty, even at its maximum resolution of 600 by 600 dpi. Still, the model handled graphics with fine, narrow lines very well.

With its low price, high-quality text, and ease of use, the ML-1210 provides the right combination for those who want the look of a corporate printer on a home-office budget. -Dan Littman



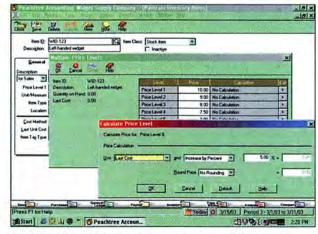
SAMSUNG'S ML-1210 laser printer produces goodlooking black-and-white prints for a great price.

### **Peachtree Updates Accounting Program**

A C C O U N T I N G IN THIS UPDATE of Peachtree's popular small-business accounting program, Peachtree Complete Accounting 2002, the most welcome news is an expansion of already powerful flexible-pricing calculations. Up to ten different price levels can be set for each item available for sale—a useful feature for businesses selling through different channels.

With this \$270 program, you can assign each price level a name, base prices on a percentage of cost to ensure profitable markups, and automatically round up amounts. Nifty new e-mail alerts, which let you monitor business operations, also generate e-mail in certain circumstances—for instance, a product manager can be notified when stock of an inventory item falls below a predetermined minimum.

Reviewing details of past transactions is both quicker and more sophisticated in the new Peachtree Complete beta version I tested. An added drill-down capability for cash receipts and payments lets you get at all the nitty-gritty transaction details in a snap.



THE NEW PEACHTREE allows wide product price-setting flexibility.

#### Peachtree Complete Accounting 2002 Peachtree

\*\*\*

A powerful accounting program, suited for small businesses; not a must-have upgrade. List: \$270 find.pcworld.com/11260

Free report templates are included for Crystal Reports for Peachtree, Crystal Decisions' powerful, industry-standard financial report generator (\$150 extra).

Many improvements are minor, such as the capability to quickly add a new customer, employee, or vendor within any transaction screen, which long has been available in market leader QuickBooks.

Peachtree Complete does have more powerful accounting features than QuickBooks, particularly for fixed assets, and with its new fast-add and drill-down capabilities, it matches QuickBooks' ease of use. This Peachtree package can be worthwhile if you need the pricing, alert, and reporting enhancements.

-Richard Morochove

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## DO-IT-YOURSELF DREAM Machines

A step-by-step guide to the smartest upgrades, plus the ultimate PC project: building your own system.



IN THE PAST, a PC that reached its second or third birthday was destined for the parts shelf, the flea market, or the kid's room. But PC components aren't what they used to

be; they're faster and more capable of pushing back obsolescence. So before you rush off to the computer store, take a good look at your old PC. Maybe all you need is an upgrade. Adding a hard disk, a sound card, extra RAM, or a home network isn't hard, and it helps you create the PC you want. (Of course, the only way to get *exactly* the system you want is to buy the parts and build it yourself. See "Build Your Own PC" on page 88.)

BY KIRK STEERS PHOTOGRAPHS BY MARC SIMON



An office user may want more speed while multitasking; a gamer, faster graphics; and an audiophile, better sound and huge vaults of storage. All of these can be yours via simple upgrades for a fraction of the cost of a new PC. Whatever your inclination, we'll show you how.

We'll cover four types of upgrade: CPU and RAM, graphics and sound, hard disk and CD-RW, and home networking. Each section suggests what to buy, discusses problems to look for, and provides instructions for performing the installation.

Trying to decide how far to go? The chart "Which Upgrades Are for You?" below lists some of the more effective upgrades for different PC activities. One of the most effective upgrades you can make is also among the least expensive: Beefing up your system's RAM costs around just 25 cents a megabyte. If you currently have 64MB or less of RAM, upgrading will almost certainly boost your system's performance significantly and may result in fewer application crashes.

Graphics cards are a good deal too. You don't need to spend \$400 for a top-of-theline gaming card—though many gamers wouldn't balk at doing so. But a little over \$100 fetches a capable 3D graphics card and (perhaps) one with high-end features like multimonitor support.

On the other hand, the competitive environment also makes it a good time to buy a new PC. And face it: An upgrade isn't always the best choice.

If you're looking for a big performance boost, a new PC—thanks especially to its up-to-date CPU and motherboard—may be the most economical solution. PCs more than a few years old may lack support for desirable technologies such as AGP (for the fastest graphics board interface), and they may have no USB ports.

If an upgrade sounds right for you, read on. If you're ready for a new PC, consider building it yourself: To learn how, start reading on page 88.

Kirk Steers is a PC World contributing editor and writes the Hardware Tips column.

#### DECISION GUIDE

OBJECTIVE	Current system spec	Our recommendation				
Improve general	Less than 128MB of system RAM	Upgrade to 128MB or more of system RAM.				
computing	Less than 500MB of free disk space	Add a bigger hard disk; a constricted swap file can slow overall performance.				
performance	An early Pentium II or older CPU	Upgrade to a low-cost Pentium III, Celeron, or Duron system.				
Connect your PCs and share	One PC and one laptop located near each other; USB ports available	Install a peer-to-peer USB network.				
an Internet connection	Multiple PCs located in different rooms, each room shares a common phone line	Install a phone-line, wireless, or ethernet home network.				
	A Pentium II or older CPU	Buy a new system with the fastest CPU you can afford.				
Create a	Less than 128MB of RAM	Upgrade to more than 128MB of RAM—as much more as you can afford.				
capable	A software MPEG decoder	Install a new graphics card with a built-in MPEG decoder or a separate decoder car				
multimedia system	A CD-ROM drive	Obtain both a DVD-ROM drive for loading video clips and a CD-RW or DVD-R drive for long-term storage.				
	A hard disk with less than 20GB of free space	Purchase the fastest, biggest drive you can afford.				
	Integrated graphics, or an old graphics card with less than 16MB of RAM	If possible, upgrade to a new AGP graphics card with 16MB or more of memory and good 3D processor.				
Improve	Less than 64MB of system RAM	Upgrade to 128MB or more of system RAM.				
gaming performance	A Pentium II-233 or less-powerful CPU	Try a CPU upgrade or buy a new system; even the lowliest Celeron- or Duron-base PC will provide stellar improvements.				
	An old, cheap sound card with a pair of mediocre speakers	Add a new sound card that supports Dolby 5.1 surround sound and good pair of four channel speakers; even an inexpensive subwoofer will add tremendous presence.				
	Any 56-kbps modem, including a V.90 model	Upgrade to DSL or cable modem service; this can vastly improve online games.				

### WHICH UPGRADES ARE FOR YOU?

## **CPU & RAM**

LET'S START WITH the basics. Your processor and RAM are so integral to PC performance that they always make likely upgrade targets. Which is best for you?

#### **CPU: LOOK BEFORE YOU LEAP**

YOU WANT A FASTER PC, so you immediately think: Get a faster CPU. Think again. Though your CPU is important, PC performance depends on all your PC's components, so upgrading to a CPU that runs at twice the speed of your current processor won't come close to doubling your system's performance. A 10 to 20 percent boost is more realistic.

And you can't drop just any CPU into your motherboard; to do the job right, you'll probably have to buy an upgrade kit from Intel, Evergreen, or PowerLeap. Kits range in price from under \$100 to over \$400. So carefully weigh the expense versus the probable increase in speed.

Our recommendation: Don't buy a kit unless it at least doubles your current clock speed or bumps you up an entire CPU class (from Pentium II to Pentium III, say). If you're budgeting more than \$250 for a new CPU, you may get a better deal by upgrading other components, or even putting the money toward the purchase of a new system.

#### BEST BANG FOR YOUR BUCK

HISTORICALLY, ADDING memory to your PC has been the most cost-effective way to increase its performance. And with 256MB PC133 DIMMs now available for around \$50, that's never been more true. If you're running Windows 98 or later, you'll see noticeable performance gains especially while running several apps at once—if you upgrade to 128MB or more.

Fortunately, adding RAM is a fairly easy process. In fact, the hardest part of the upgrade consists of finding modules of the right type and size for your PC. For the correct RAM specifications, check the user manual or motherboard manual that came with your computer. Most systems that people have purchased in the past several years use SDRAM, which comes in various flavors (PC66, PC100, PC133, and—on newer, often AMD, systems—DDR SDRAM). Older machines may use

FPM or EDO DRAM; and some newer, pricier models use relatively expensive Rambus DRAM (RDRAM, or RIMMs).

This is usually not a mix-and-match situation; you should use the same type and speed of RAM already in your PC. Memory vendors like Crucial (www.crucial. com) and Kingston (www.kingston.com) offer excellent tools for matching RAM to specific PC models or motherboards.

You must also determine whether your motherboard uses SIMM or DIMM RAM modules. Most systems made in the past three years use DIMM modules, while many older PCs use SIMM modules



(which are shorter and must be installed in pairs). A few PCs can take both—but often they run on only one type at a time.

Before you buy, make sure that you have the requisite open RAM slots on your motherboard and that the motherboard will accept the upgrade module you're considering. Sometimes RAM slots must be filled in a certain order or with a module of a certain capacity.

And finally, don't buy generic, budget memory. Paying a few extra dollars for DIMMs or SIMMs from a company like Kingston or Crucial can save you hours of frustration and troubleshooting.

#### HOW-TO

## **Beef Up Your RAM**

#### 1. Open the case.

2. Get grounded. Use an antistatic wrist strap-available at any local electronics or computer store-or at the very least,

touch the frame of your PC while it's still plugged in. Then unplug it.

3. Pick up the module. Always hold RAM modules by their side edges. Avoid touching the flat surfaces or the contacts along the bottom edge.

4. Insert it. For DIMMs, lower the module into the slot and press carefully (A). The module should seat itself, and the clips on both sides of the module should snap into place. If they don't, the module isn't properly seated.

For SIMMs, orient the module to match the others in the system, insert the mod-

> ule at a 45-degree angle, and rotate to the vertical (B). If you do it right, you should feel the snap of the two supporting clips closing into place.

5. Power up. Turn on your system. Watch the screen for the RAM test, and confirm that your PC recognizes the additional RAM. If you see any error messages, or if your system locks up, remove and reinstall the new modules.



## **GRAPHICS & SOUND**

YOUR PC ISN'T just a toy for your brain; it's a toy for your eyes and ears as well. If you're interested in games, graphics, music, or digital video, adding a new graphics card or sound card can vastly improve your PC experience.

The latest graphics cards offer a plethora of pixel-processing pluses: not only more-sophisticated processors, but also specialized features, such as gobs of dedicated RAM, TV tuners, and MPEG-2 decoder hardware (great for watching DVD movies). But many of these cards are also prohibitively pricey. Expect to pay about \$400 for a card sporting NVidia's hot new GeForce3 chip and 64MB of DDR RAM—more RAM than you'll find on some budget PCs. But if you're not a die-hard gamer whose virtual life hangs on the clarity of every pixel, relax; plenty of lower-cost alternatives exist (see this month's Top 10 Graphics Boards, as well as our Top 10 gaming cards at find.pcworld.com/11020).

Before you buy, however, check your PC. Some older or budget systems lack the AGP slot used by most of today's cards. If yours doesn't have one, you'll have to use a PCI board and settle for a relatively modest performance boost.

The graphics subsystems of many budget systems sold in the past few years including many based on Intel's 810e chip set—aren't upgradable. These systems come with both graphics and audio support built into the motherboard. They also usurp a portion of the system RAM for graphics duties. Check the back of your PC: If the monitor connector is grouped with the keyboard, mouse, and USB connectors and isn't in an expansion



card slot, you probably have integrated sound and graphics. If you don't have an AGP slot, you won't be able to upgrade.

#### FINE-TUNING

IN MANY OF today's fast-moving games, winning depends on hearing your competitors as well as seeing them. If you're just making do with the garden-variety sound card that accompanied your PC, consider moving up to a card that supports the latest Dolby 5.1 processing.

#### HOW-TO

## **Change a Card**

 Get the most recent version of your card's drivers from the vendor's Web site. It's not uncommon for vendors to update their drivers shortly after putting the final product on the market.

 Read the installation instructions that come with the card or with any driver you download from the vendor's site.
 If you're replacing an existing card, remove the current card's driver in Windows. First go to Add/Remove Software in Control Panel, and



remove any software. Then go to *Device Manager*, select the device, and click the *Remove* button.

If you're swapping graphics cards, you can't remove the driver. But you can replace it with Windows' standard VGA driver.

Open Device Manager, double-click Display Adapters, and then double-click the card's entry. Click Driver+Update driver+Next when the Update Device Driver Wizard comes up. Select Display a list of all the drivers, click Next, and then select Show all hardware. Under Manufacturers, select (Standard display types); then under Models, select Standard Display Adapter (VGA) (A).

Shut down your PC and open the case. Make sure you're electrically grounded (see "Beef Up Your RAM," step 2, on page 77).
 For sound cards, you'll need to remove any internal audio-in connectors—such as those from your CD-ROM or CD-RW drive.

6. Gently remove the old card. Don't lose the screw that fastens the card to the chassis. Be sure to retrieve any screw or other metal part that falls on your motherboard-such items could cause a short when you power your system back up.

7. Remove the new card from its packaging. Don't touch the flat



surfaces or bottom edge. Align the connecting edge with the expansion slot, and push evenly across the top of the card, increasing pressure until the card is seated fully in the slot (B). Fasten the card to the chassis with the screw you removed in step 6.

8. Reattach any internal connectors (sound cards) or passthrough cables (graphics cards).

9. When you restart your PC, Windows should automatically recognize the new card and guide you through installing the driver.



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- Dual Integrated Ultra3 SCSI Controllers
- 24X Max IDE CD-ROM
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## IS IT LIGHT OR IS IT POWERFUL? YES.





PC World, #1 Best Buy, Midrange Notebook Dell™ Inspiron™ 4000 - August 2001



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- 26.5WHr Li-Ion Battery w/ExpressCharge<sup>™</sup> Technology
- Internal Mini-PCI 56K Capable<sup>®</sup> Modem
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A top-of-the-line card like Creative's Sound Blaster Live Platinum 5.1 offers stunning 3D sound—thanks to its support for five speakers and a subwoofer plus special effects. The Live Platinum 5.1 sells for around \$200, but other Dolby 5.1 cards are available for less than \$100.

Don't forget: A great sound card is only as good the speakers attached to it. A firstclass rig, such as Klipsch's ProMedia 4.1 system, will make your ears swell and your wallet shrivel—to the tune of \$300. Budget-minded audiophiles should consider Creative Labs' FPS2000 system; it offers excellent sound at half that price.

## HARD DISK & REMOVABLE STORAGE

IF YOU WORK with an older PC equipped with a modest 10GB or smaller drive, you may already be experiencing an acute need for additional space; if not, you will feel the squeeze soon enough. Gluttonous software programs like Windows XP (which alone gobbles at least a giga-

byte of space) and MPEG, JPEG, or MP3 files devour your hard disk's real estate.

A reliable 30GB or 40GB drive from a manufacturer like IBM, Maxtor, Seagate, or Western Digital costs less than \$150 if you shop around. An additional \$50 to \$150 buys a 60GB to 80GB drive that runs at 7200 rpm and supports the ATA/100 (or Ultra DMA/100) interface.

To reap the full benefits of an ATA/100 drive, your PC must also support ATA/ 100. Check your PC's user manual. If yours doesn't, you can add an updated interface via an ATA/100 expansion card like the Ultra100 TX2 adapter card from Promise Technology. But unless you constantly move extremely large amounts you probably won't see much of a performance difference from using an ATA/100 drive on an ATA/66-capable PC.

Speed zealots may want to consider a faster, more expensive SCSI hard drive, which requires purchasing and installing a SCSI bus card in addition to the drive.

Alternatively, you can buy a DVD-R or CD-RW drive and use it to store your space-gobbling music, video, or other data files on discs. Such a drive provides a nice backup option, and you'll be able to burn audio CDs to your heart's content. CD-



MAXIOR Diamonumax Plus 60.

of partitioning and formatting your drive. Discount versions of some hard drives so-called bare drives—come packaged in an antistatic bag with no box and may lack such software. Ask before you buy.

#### HOW-TO

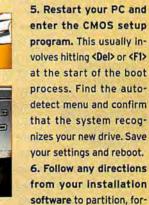
## **Add a Hard Disk**

1. Read the installation instructions, and run any installation software that must be launched before you begin installing the

hard drive in your system. 2. Shut down your PC and open the case. Make sure you're electrically grounded (see "Beef Up Your RAM," step 2, page 77). 3. Set the jumpers (A) on your drive to the desired master or slave setting. 4. Attach the hard drive to the case, and connect the power and EIDE cables to the drive (B). Take care

to attach pin 1 on the motherboard to pin 1 on the drive. One edge of the cable should be colored to help you keep track. (Often-but not always-the manufacturer includes a notch and key on the plastic connectors to prevent misalignment.)

Ultra100 TX2 previously mentioned.



mat, and copy data to your drive. If you don't have installation software, you must perform these tasks manually.

is much easier than it "mu used to be. Most hard ing drives come with installation software to cha simplify the process use and formatting your drive. sec

RW drives can be had

for \$150 to \$250 (see

August's Top 10 CD-

RW Drives for details).

PICK A PORT

INSTALLING a hard

disk or CD-RW drive

Physically installing the drive is a bit more challenging. You need an unused 5-volt power connector and an open EIDE port. Almost all recent PCs come with primary and secondary EIDE channels built into the motherboard. Each channel supports up to two drives on a single cable. Jumper settings define each drive as "master" or "slave." The hard disk holding your operating system should always be set as the master drive on the primary channel. Typically the primary channel is used for up to two hard drives, and the secondary channel for CD-ROM, CD-RW, or other removable-media drives. If you need more than four drives, you'll have to install an add-in card such as the Promise

## HOME NETWORKING

A HOUSE OF connected PCs means no more fighting for an open phone line to check your e-mail: Two or three people

can share a lowly 56kbps connection without much discomfort.

And if you opt for a broadband Internet connection like DSL or cable modem service, everyone on the network will enjoy the faster downloads. You

can also get by with one network printer.

And nothing reduces family counseling bills like a furious free-for-all during a game of networked Doom or Quake.

#### **GETTING BETTER**

INSTALLING A HOME network has gotten easier. That's *easier*, not *easy*. Unless you're already a network guru, you should try to keep things as simple as possible.

If you have just two PCs sitting near each other, or if you're looking for a simple way to connect a desktop and a laptop, consider a USB adapter network like Belkin's \$80 USB Direct Connect. It's slower than an ethernet network, but it's cheaper

and simpler to install.

If you need ethernet speed and sophistication, you can choose from several products. All involve adding a card or USB adapter to each PC and then connecting them by different methods.

Proven phone-line networking kits like Intel's AnyPoint phone-line products and 3Com's HomeConnect products are fast, easy to set up, and affordable (about \$50 per PC). Their biggest drawback: You need to have a phone jack near each PC on the network (see "Home Wired Home," June 2000, find.pcworld.com/10881).

If you're short on phone-line connections or you move around the house a lot with a laptop, a wireless network may be your best bet. The latest wireless kits based on the 802.11b standard can broad-

#### HOW-TO

## **Install a Network**

Install the network cards in each system. Follow the procedure on page 78.
 Make your network connections. For phone-line networks, plug the cable into



both the back of the PC (A) and the phone jack. If you already use the phone jack for a phone or fax machine, you'll need

to insert a line splitter for sharing the jack. Wireless adapters may require attach-

ing or adjusting an antenna. 3. Turn the system back on. Windows

should recognize the new hardware and prompt you for the appropriate driver software, which should be on a floppy disk or CD-ROM that came with the adapters. 4. Follow all the instructions that came with your hardware to install and configure your networking software. Setting up a network can be tough; if you have problems, call tech support.

5. Set up the Internet sharing software. Most kits come with software that lets multiple systems share a single connection. If yours doesn't, you can use built-in connection-sharing software in Windows 98 SE, Me, and 2000: Go to Start•Programs•Accessories•Internet Tools. (You may have to install the software from the Windows CD, using Add/Remove Programs in Control Panel.) cast through walls and outside as far away as 500 feet (though speed diminishes with distance). On top of the \$199 to \$399 base price, expect to pay \$129 per desktop and \$129 per laptop for network adapters.

In *PC World* tests, the Linksys BEFW-11S4 EtherFast Wireless AP was easiest to set up (see "Wireless Comes Home," July 2001, find.pcworld.com/10882).

Finally, if you have a number of PCs in one room, you might consider a network using traditional twisted-pair ethernet cable. As with wireless, setup is not for novices; and the cost of running the cables through walls can restrict how far apart you can place the PCs.

#### STARTING POINTS

#### **CPU UPGRADE KITS**

Intel www.intel.com Evergreen Technologies www.evergreennow.com PowerLeap www.powerleap.com

#### RAM

Crucial www.crucial.com Kingston www.kingston.com

GRAPHICS CARD

ELSA Gladiac 920, \$399, www.elsa.com ATI Radeon 64MB DDR, \$199, www.ati.com

#### SOUND CARD

Sound Blaster Live Platinum 5.1, \$200, Creative, www.creative.com Santa Cruz, \$80, Turtle Beach, www.turtlebeach.com

#### SPEAKERS

ProMedia 4.1, \$300, Klipsch, www.klipsch.com FPS2000, \$150, Creative, www.creative.com

#### HARD DISK

Maxtor DiamondMax Plus 60, \$230, www.maxtor.com Seagate Barracuda ATA III, \$150, www.seagate.com

HOME NETWORKING Linksys BEFW11S4 EtherFast Wireless AP+, \$299, www.linksys.com





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COVER STORY /

#### BY STAN MIASTKOWSKI PHOTOGRAPHS BY MARC SIMON

## **BUILD YOUR OWN PC**

#### STEP-BY-STEP

YOU DON'T NEED A hammer, a saw, and a shelf full of *This Old House* tapes to qualify as a bona fide do-it-yourselfer. For computer aficionados, building your own PC is the ultimate do-it-yourself project—and you don't even need to be a pocket-protector type to get the job done. Why build your own PC? The best reason is to craft a system that exactly matches your needs. The next best reason is to save money: With careful shopping, you can build a custom PC for \$100 to \$200 less than an off-the-shelf system costs. As a bonus, you'll learn a lot about how PCs work by building your own.

But building a complete PC isn't everyone's cup of tea. One of the biggest advantages of buying an off-the-shelf, name-

#### Gather the parts and pieces

To figure out the exact components for your custom PC, check out manufacturers' Web sites, study reviews, and look over *PC World's* Top 100 listings. Hardware Web sites such as Tom's Hardware (www. tomshardware.com) and Anandtech (www. anandtech.com) are good places to find motherboard recommendations. A. ATX case and power supply (\$50 to \$300): The most popular case is a basic midtower. Most come with a power supply preinstalled, but make sure that it meets your system's needs. (For details, see the August *Upgrade Guide*, find.pcworld.com/10883.) B. Keyboard and mouse (\$15 to \$75 for keyboard; \$10 to \$75 for mouse). C. Monitor (\$150 and up).

D. Motherboard (\$100 to \$200): Purchase a motherboard that's matched to your processor, with room to grow. Avoid models with built-in video; they're compromises, at best. E. Processor (\$100 to \$600): A 1-GHz or faster processor can cost less than \$200. Lower-end (600- to 800-MHz) CPUs are fine



brand system is having access to one-stop technical support. If you run into trouble with your home-built system, you'll have to figure out how to isolate the problem yourself. You'll also need to spend time researching and buying the components for your system. PCWorld.com's Product Finder (www.pcworld.com/productfinder) is a good place to start looking.

But if you're ready for the whole enchilada, here's a step-by-step guide to building your own custom PC.

Stan Miastkowski is a contributing editor for PC World.

if you have a limited budget. If your CPU doesn't ship with a cooling fan, you'll need to purchase one for about \$25.

F. Memory (\$50 to \$200 for 256MB): Make sure to match the RAM type and speed to the motherboard. See "CPU & RAM," page 77.
G. Floppy disk drive (\$15 to \$20).

H. Hard drive(s) (\$90 to \$250 each).

I. CD-RW drive (optional; \$150 to \$250).

J. CD-ROM drive (optional; \$35 to \$75).

K. DVD-ROM drive (optional, \$75 to \$150). L. Removable-media drive (optional; \$50 to \$500): Your choices range from 250MB Zip drives to 2GB Jaz drives, as well as tapebackup drives. Some devices require a separate SCSI add-in controller (\$50 to \$100).

M. AGP graphics card (\$75 to \$400): Plan to spend more if you work with high-end 3D graphics or are a dedicated gamer; but inexpensive cards are fine for more-mundane computing tasks.

N. Sound card (\$30 to \$200): If you choose an add-in card, you'll need to disable the motherboard's built-in sound (if any); this usually involves working through the setup program or using a jumper.

O. Network card (optional; \$50 to \$100).

P. Modem (\$40 to \$75): A necessity if you don't have broadband Internet access.

Q. Operating system and software (free to \$220 and up): You'll need to obtain a copy of your OS of choice, as well as copies of any major applications you use. Of course, you can opt for free alternatives, such as Linux.

#### Get ready for construction

Clear a good-size workspace with plenty of light. It's best to avoid carpeted

areas, which can quickly accumulate componentdestroying static electricity. You'll need a Phillipshead screwdriver, a pair of needle-nosed pliers, plenty of time, and an antistatic

wrist strap (available at electronics stores) to wear when handling electronic parts (A).

Prepare the motherboard

Most of today's motherboards have only a few jumpers, and you seldom need to deal with the ones that are there. Usually, the default settings will work fine. But read the manual for your motherboard carefully to see if any need to be changed.

If you purchased your motherboard along with a CPU and RAM, these com-

ponents may already be installed. Otherwise, you'll need to do it. Lay the motherboard on a flat surface and install the RAM into the RAM sockets, beginning with the socket marked "Bank O." Slide the module firmly into the socket. A bracket on each side will snap into place when the module is correct-





Gather all your components and unpack them to confirm that everything is included.

> Remove the computer case cover and lay it flat on your work surface. Inside, you should find the AC power cable, mounting brackets, and a bag of screws.

It's also a good idea to collect the latest driver updates for your hardware on a CD-R or a Zip disk.

> ly seated. If you purchased multiple modules, install the rest of them now.

> Work very carefully when installing the CPU. Lift the lever located on the side of the socket and carefully insert the processor. As you do so, make sure that pin 1 on the processor matches pin 1 on the socket. The CPU will fit correctly only one way. Hold the processor

firmly in place and lock the lever down (A).

Install the cooling fan/heat sink on the CPU (procedures vary, so read the instructions carefully), and attach the fan power connector to the connector on the motherboard (B). (See the motherboard manual for the correct location.)

#### Install the motherboard in the case

Screw in the metal standoffs (packed with the case hardware) that will hold the motherboard in the case (A). Carefully slide the board into place (B). You'll know it's correctly seated when the mounting holes line up. Using the screws that came with the case, mount the motherboard. Be careful not to overtighten the screws, or you may damage the board.





Next, hook up the small connectors for the case's on/off switch, the reset button, speakers, and the indicator lights (power and hard disk activity) to the motherboard. See your motherboard manual for details, and work carefully.

Finally, connect the large power connector from the PC's power supply to the motherboard. The connector will fit only one way.

#### Perform initial testing

Now's the time to do a quick test of the motherboard, CPU, and RAM. Insert the graphics card into the motherboard's AGP slot, secure it with a screw, and hook up the monitor, keyboard, and mouse. Connect the AC power cord from the rear of the PC to the wall, and turn on your PC. If your PC beeps once and you see BIOS information on the screen, the core components of your PC are working fine. Unplug the PC from the wall and continue with the steps below.

But if your PC doesn't power up or you

don't see anything on the screen, doublecheck all connections (especially for the power-switch cable running from the case switch to the motherboard) and try again. If that still doesn't work, see "Hunt Down PC Building Problems," on page 92.

#### Install drives

Using the screws that came with the case, install the floppy disk drive. (If you aren't sure where it goes, look for the cutout in the front panel of the case.)

Next, make sure the jumpers on your EIDE



hard drive (A), CD-RW drive, and other drives are set correctly. For more on how to prepare

your drives for installation, see "Hard Disk & Removable Storage" on page 83.

Make sure the data and power connectors on all drives are facing inside the case.

Mount your hard drive (or drives) in the appropriate location, usually in bays in the middle of the case near the motherboard. If you have two hard drives, install the second one next to the primary drive to make hooking up the cables easy.

For components, such as CD-RW drives, that you'll need to access from the front of



the case, you may have to attach mounting brackets that came with the case. Some cases don't require them. When you install the drives, make sure that their fronts line up with the front of the case (B).

#### Install add-in cards

Press firmly and evenly on each add-in card until the card is seated properly in its slot; then screw the card down using the set of screws that came with your case (A).



#### Connect the cables

It's time to wire everything up. When making connections, make sure that pin 1 of the wide data cables (usually the red wire) connects to pin 1 of the drive and motherboard connectors. (If you're lucky, you'll have keyed connectors on the cables that fit in only one way.) Note the beveled edge on the power connectors and their sockets, but be careful: You can force them in the wrong way.

A. Attach the floppy disk data cable from the drive to the floppy connector on the motherboard.

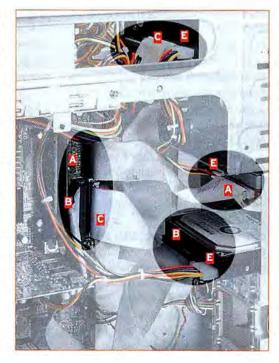
**B.** Plug the wide data cable into the primary EIDE channel connector on the motherboard and into the first hard drive on the other end. If you have a second drive on that channel, attach the second connector on the cable to it. (It doesn't matter which connector you use on which drive.)

C. Connect a wide data cable from the secondary EIDE connector on the motherboard to your CD-RW drive. Attach the second connector to the second EIDE drive on that channel (if any).

D. Run the thin audio cable (not pictured) from the rear of your CD-ROM or DVD-ROM drive to the appropriate connector on the sound card-or to the motherboard, if you're using its built-in sound support.

E. Plug power connectors into your floppy drive; your hard drive(s); your CD-ROM, CD-RW, or DVD-ROM drives; and any other removable-media drives.

Other drives (such as a DVD-ROM) may have additional cables. Follow the directions that came with the drive to connect these cables correctly. If you run out of power leads, purchase a "Y" connector to add a lead.



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#### Connect external peripherals

Plug the keyboard and mouse into the appropriate connectors on the back of the case. Also hook up your monitor, speak-

ers, printer, and other devices (such as network or modem cables). Finally, plug the AC cord from the power supply into the wall.

#### Install the operating system

Before you can set up your operating system, you must give your PC access to your CD-ROM drive. All Windows setup CD-ROMs are bootable, and most motherboards can boot from a CD-ROM. You

program to do that. Reset your PC and enter setup. (Procedures vary, but often you press the <Del> key at start-up.) The procedure for allowing CD-ROM booting also varies, though

might, however, need to tell your PC's setup



most commonly you enter the BIOS Features Setup menu and then cycle through the Boot Sequence menu until you see an entry that includes the CD-ROM drive. Save the setting and reboot your PC. Windows setup should start (A). Follow the directions on screen to install. Keep the installation CD-ROMs for your new hardware handy.

#### Check Windows and install drivers

If you're lucky, Windows setup will recognize and install the correct drivers for all the hardware in your new PC. To check, go to Start-Settings-Control Panel, choose the System icon, and click the Device Manager tab (A). If all your peripherals are listed and you don't see any yellow exclamation points, Windows recognizes all your hardware. If you do see exclamation points, right-click on the offending entry, choose Properties, and follow the directions to use the Windows hardware troubleshooter.

When the Device Manager shows all clear, install the software for your graphics card and sound card. Follow the manufacturer's directions. You may need to install extra software for your modem and network card (if

#### Finish up

Once you're sure that the hardware and operating system are functioning correctly, make a basic backup disk that you can use to restore the system if you run into future problems. (Most CD-RW drives come with software for creating system backup you have them). In many cases, Windows recognizes these components and installs the required drivers and software.



CDs, in case you don't have a large-capacity removable-media drive or tape backup.)

Finally, install all your applications, make sure everything's okay, and create another backup; then put the cover on your new custom PC, and enjoy yourself.

#### TROUBLESHOOTING

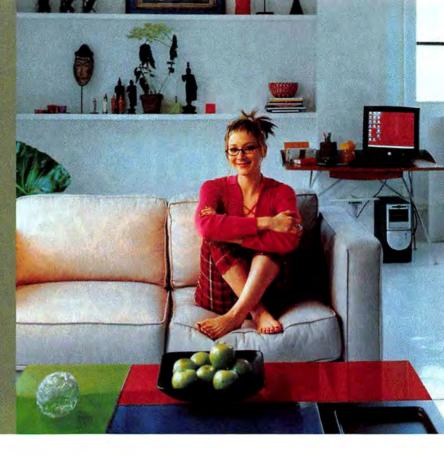
## Hunt Down PC Building Problems

IF NOTHING HAPPENS the first time you turn on your PC, it's time to troubleshoot. First, confirm that the PC power cable is firmly attached and that you've plugged it into a live AC outlet. If you have a voltmeter, you can easily check whether the power supply is creating voltage. If that doesn't solve the problem, unplug the PC from the wall and start checking connections. Make sure the motherboard power connector is firmly attached, and that the CPU, RAM, add-in cards, and all connectors are firmly seated. Hint: Double-check the connector from the case switch to the motherboard. It's easy to misconnect it.

If the preceding steps don't solve the problem, start pulling out add-in cards (except the graphics card), one by one (with the power turned off and the system unplugged, of course). After you pull out a card, try starting the PC again. If your PC starts up, the last card you pulled out is the problem. Pulling out the graphics card is a nono because most motherboards won't work without one.

Tracking down problems with your RAM, CPU, or motherboard is more difficult. Ideally, you would swap out each of those components one at a time, but most of us don't have extras sitting around.

If your PC starts but you have trouble installing the operating system, the problem could stem from a number of sources. The Microsoft Knowledge Base (www.windows.com) has extensive reference material on common setup issues. If you're installing Windows Me, you'll find a helpful troubleshooting section at www.microsoft. com/windowsme/support. I.8GHz. my friends are envious. my enemies are scared.





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- 59WHr Li-Ion Battery w/ExpressCharge\*\* Technology
- MS\* Works Suite 2001 MS\* Windows\* Me
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#### Multimedia Mobile Desktop

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- 14.1" Super XGA+ TFT Display
- 192MB 100MHz SDRAM
- 20GB<sup>5</sup> Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 16MB ATI® Rage Mobility™-M4 3D® 4X AGP Video
- Internal 56K Capable<sup>6</sup> FaxModem
- 59WHr Li-Ion Battery
- MS\* Works Suite 2001 MS\* Windows\* Me
- 1-Yr Limited Warranty<sup>2</sup> 1-Yr Mail-in Service
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- Fixed 8X Max DVD-ROM Drive
- 8MB ATI\* Rage Mobility<sup>™</sup> 128 3D\* 2X AGP Video
- Internal 56K Capable<sup>®</sup> FaxModem
- 59WHr Li-Ion Battery w/ExpressCharge<sup>™</sup> Technology
- MS\* Works Suite 2001 MS\* Windows\* Me
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#### DELL<sup>™</sup> INSPIRON<sup>™</sup> 8000

#### Multimedia Mobile Desktop

- Intel\* Pentium\* III Processor at 1.0GHz
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- 256MB 100MHz SDRAM
- 20GB<sup>s</sup> Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 32MB DDR NVIDIA\* GeForce2 Go<sup>\*\*</sup> 4X AGP Video
- Internal 56K Capable<sup>6</sup> FaxModem
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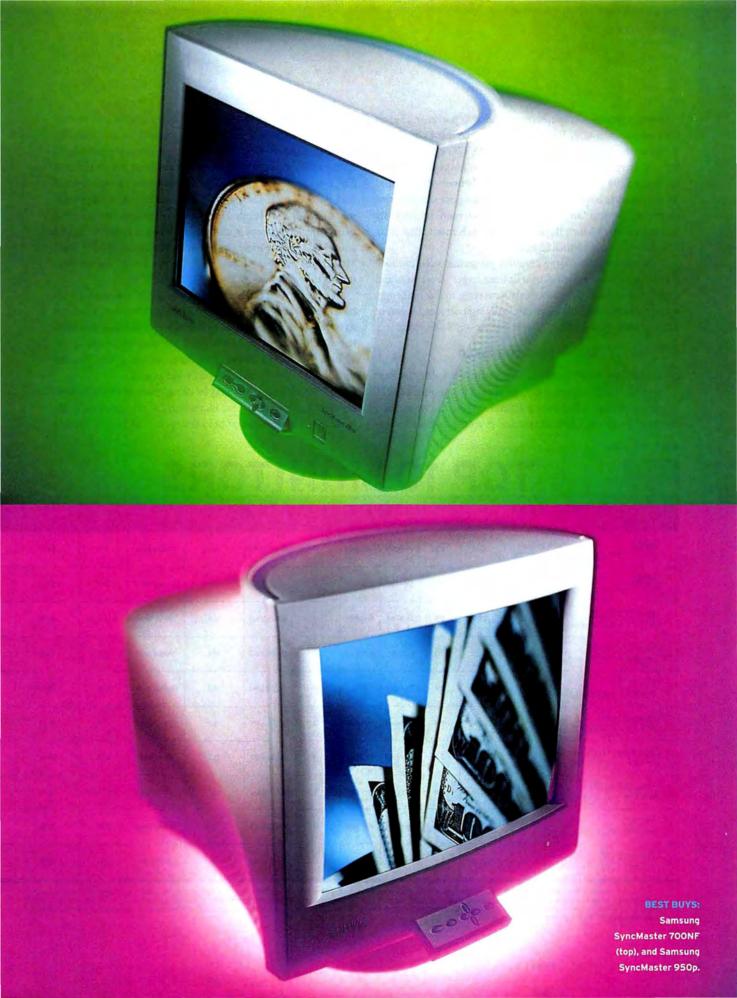


Our tests of 22 new displays reveal which ones give you the most monitor for your money.

BY KALPANA NARAYANAMURTHI PHOTOGRAPHS BY MICHAL VENERA

SHOPPING FOR A COMPUTER MONITOR CAN BE like looking for the right house. Some home buyers put appearance before square footage, while others are concerned with a property's size or the features that make it distinctive. But even the most beautiful gem of a cottage won't meet your needs if it's too small, and the cheapest mansion isn't a good buy if it's an eyesore.

So do you want a monitor with great curb appeal, or are you willing to sacrifice image quality to get a little more elbow room? In addition to the simple question of size, you must choose among low- and high-end models, some with USB ports, some with flat screens, some with curved screens, and some with prices too good to pass up. Oh, and did we mention LCDs?



Several years ago computer users tended to purchase 15-inch CRT monitors, mainly because they were the most affordable. But prices have fallen considerably. In 1999, 17-inch CRTs vying for our charts cost an average of \$417; now many are available for under \$200. As a result, the differences between 17-, 19-, and 21-inch models have narrowed so much that prices in each size class overlap—you can now choose a 19-inch monitor that costs less than many 17-inch displays, or a 21-inch model that costs less than high-end 19-inch screens.

Furthermore, demanding graphics programs, such as those for image and video editing, benefit from larger screen area and higher resolutions. Graphics cards have risen to the challenge; many currently available cards can easily support a resolution of 1280 by 1024, 1600 by 1200, or even higher—at 32-bit color.

#### SURVEYING THE FIELD

TO HELP YOU SORT OUT which monitors provide the best screen real estate for your dollar, we set out to appraise 22 CRT monitors in three different size classes—17-inch, 19-inch, and 21-inch. We threw a host of text and graphics applications at them to see which produced the best image quality, and we evaluated each unit's features, price, service policies, and usability. To fairly compare monitors of different sizes, we considered each model's viewable area when we calculated its overall score. (On average, 19-inch monitors offer 26 percent more viewable area than 17-inch ones, and 21-inch models offer 56 percent more.) Finally, we limited our field to monitors that cost less than \$700. The cheapest unit we looked at, a 17-incher, cost a scant \$195, and the most expensive, a 19-incher, cost \$699. NEC-Mitsubishi declined to participate in our review, so we were unable to evaluate any of their CRT displays.

After all the tests and inspections, one model—Samsung's 19inch SyncMaster 950p—emerged as the clear winner, thanks to its impressive image quality, wealth of useful features, and hardto-beat \$284 price. Close on its heels was another Samsung, the 17-inch SyncMaster 700NF. Its fantastic image quality and reasonable \$279 price make it a solid value as well.

While 17-inch monitors may be de rigueur now, 19-inch models' falling prices make them increasingly worth considering. On our chart, 19-inch displays hold five spots, and 17-inch models

#### ROUNDUP

	EST T	OF	> 1	0	M	ON	IIT	OR	S			
	MONITOR	Street price (6/8/01)	Overall rating	Text quality	Graphics quality	Size class (inches)	Dimensions (inches)	Measured viewable area (inches) <sup>2</sup>	Tube type	Pitch (mm) <sup>3</sup>	Maximum refresh rate at tested resolution	
1	Best Samsung SyncMaster 950p	\$284	93	Very good	Very good	19	18.4/19.0/18.6	18.0	Shadow mask	0.26	89 Hz	
2	Best Samsung SyncMaster 700NF	\$279	93	Excellent	Excellent	17	16.3/17.6/17.2	15.9	Diamondtron NF	0.25	89 Hz	
3	Sony CPD-G220S **** find.pcworld.com/10572	\$370	90	Excellent	Excellent	17	15.8/16.5/16.6	15.9	FD Trinitron	0.24-0.25	85 Hz	
4	ViewSonic GS790 **** find.pcworld.com/10573	\$315	90	Good	Very good	19	17.6/18.3/16.2	18.0	Shadow mask	0.26	89 Hz	
5	KDS VS 195i ★★★★☆ find.pcworld.com/10574	\$259	89	Very good	Good	19	18.2/18.3/19.1	18.2	Shadow mask	0.25	85 Hz	
6	Compaq P710 **** find.pcworld.com/10575	\$379	89	Very good	Very good	17	16.1/16.2/17.1	15.9	Diamondtron NF	0.25	85 Hz	
7	Eizo Nanao FlexScan T565 ***** find.pcworld.com/10576	\$499	89	Very good	Excellent	17	16.1/16.3/17.3	15.8	FD Trinitron	0.25	118 Hz	
8	Sony CPD-G420S	\$530	89	Very good	Very good	19	17.8/18.5/18.1	17.9	FD Trinitron	0.24-0.25	85 Hz	
9	HP P920	\$529	88	Very good	Very good	19	18.4/19.1/18.6	17.9	Diamondtron NF	0.24	85 Hz	
10	Optiquest 0115 ***** find.pcworld.com/10579	\$578	88	Good	Very good	21	19.6/19.8/19.2	19.6	Shadow mask	0.26	88 Hz	

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), 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. The 17-inch models at 1024 by 768 resolution, 19-inch models at 1280 by 1024 resolution, and 21-inch models at 1600 by 1200 resolution. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



capture four. A lone 21-inch contender snags the number ten spot. All of the monitors that made the chart cost less than \$600; the most expensive is the 21-incher-which, at \$578, is still a bargain for its viewable area.

The chart demonstrates, however, that the best value isn't necessarily the monitor with the most screen area. Two 17-inchers, the SyncMaster 700NF and Sony's CPD-G220S, earned high chart positions because they were the only two models to earn Excellent ratings for both text and graphics.

Flat-screen, aperture-grille units grabbed six spots on the chart, edging out displays based on invar shadow mask technology. However, flat-screen displays usually cost more: Of the six on the chart, only one, the 17-inch SyncMaster 700NF, is under \$300. (See "What Makes a Monitor Expensive?" on page 100.)

#### THE APPRAISAL PROCESS

ACCORDING TO RHODA ALEXANDER, director of monitor research at market research firm Stanford Resources-ISuppli, over 80 percent of current computer users surveyed would choose a display costing \$350 or less. In the past, that figure might have restricted the choice to 15- and 17-inch monitors, but falling prices have blown the field wide open.

> Mario Morales, a data electronics technician at Cerritos Community College in Norwalk, California, was looking for monitors below that \$350 price ceiling. Faced with the prospect of having to replace roughly 200 to 300 computers and monitors on campus each year, Morales conducted extensive research before settling on two models to distribute to all departments: the 17inch ViewSonic GS773 and the 19-inch ViewSonic GS790 (number four on our chart). According to Morales, price wasn't as much of an issue as short case depth, given the space constraints in many of the college's classrooms. Indeed, for departments with small laboratories, Morales says he is recommending LCD monitors instead.

> Although we've chosen to focus on CRT monitors in this roundup, we're well aware that LCD monitors-particularly 15-inch displays-have been dropping in price in recent months. However, LCD monitors still cost substantially more than CRTs, especially if you consider the screen size. Stanford Resources' Alexander says that if your budgetary constraints are more pressing than your space constraints, a CRT monitor continues to be a sensible investment.

Maximum resolution (at minimum refresh rate of 70 Hz)	Ease of use of controls	TCO compliance	Extras	Warranty (years)	Tech support (hours/days, charge)
1920 by 1440	Excellent	99	Color- and image-adjusting software	3	24/7, toll-free
1920 by 1440	Excellent	99	Color- and image-adjusting software	3	24/7, toll-free
1280 by 1024	Very good	99	Built-in speaker	3	24/7, toll-free
1600 by 1200	Good	99	Horizontal and vertical moiré adjustment	3	24/7, toll-free
1600 by 1200	Good	99	None	3	11/5, toll-free
1600 by 1200	Good	99	Moiré adjustment	3	24/7, toil-free
1600 by 1200	Very good	99	Bezel button alters color temperature for text and graphics applications	3	8/5, toll-free
1920 by 1440	Very good	99	Built-in speaker	3	24/7, toll-free
1920 by 1440	Satisfactory	99	None	1	11/7, toll call
1600 by 1200	Very good	92	Moiré adjustment	3	24/7, toll-free

Visit find neworld com/10860 for details on PC World's Star Ratings

<sup>1</sup>In order: width, height, depth. <sup>2</sup> Viewable area as represented by the measurement from one corner of the monitor diagonally to the opposite corner. <sup>3</sup> Specification represents dot pitch for shadow mask monitors and stripe or varying stripe pitch for FD Trinitron and Diamondtron NF monitors.

#### Samsung SyncMaster 950p

Best What's Hot: An affordable price; clear, crisp text; and BUY lively graphics hoist Samsung's 19-inch SyncMaster 950p into the top spot; it's our pick as the best monitor value for the buck. At \$284, the 950p costs less than several of the 17inch models in the test group. Nevertheless, the 950p's text scores beat those of all the other monitors except for its 17-inch cousin, the number two SyncMaster 700NF, and the number three Sony CPD-G220S. Its graphics scores, while not quite as impressive, still outranked much of the field. Also helping the 950p stand atop the chart are a well-organized manual that includes a helpful index, and color- and image-adjusting software that comes with its own dedicated manual.

What's Not: At 18.6 inches in depth, the SyncMaster 950p is

#### PRICE CHECK

## What Makes a Monitor Expensive?

IF YOU'VE EVER considered purchasing a new monitor, then you've probably found that prices lie all over the map. Even if two 17-inch CRTs look identical, one can cost as much as \$500; another, less than \$200. So what the heck is the difference between the high- and low-priced models, anyway?

According to Rhoda Alexander, director of monitor research at market research firm Stanford Resources-ISuppli, the biggest factor determining a monitor's cost is the type of tube it uses. Less-expensive monitors tend to use invar shadow mask technology, in which the monitor's electron gun fires electrons through a shadow mask (a metal sheet riddled with holes), which focuses the beam to illuminate precisely the phosphors coating the inside of the front glass of the tube.

More-expensive models tend to use aperture-grille tubes, which focus the electron beam with thin vertical wires instead of a shadow mask. The aperture grille sits on a heavy metal frame, so monitors that use it require more metal than shadow mask monitors do. As a result, they're more expensive to manufacture. Ian Miller, director of technology for Samsung Electronics America, notes that if a monitor has a flat screen (which most aperturegrille monitors now feature), rather than a curved screen, it will probably be more costly. That's because of the complicated manufacturing process required to correct image distortion at the corners of the display, where the glass must be curved on the inside to ensure that the electron beam accurately hits the proper phosphors.

Vendors that use a flat-screen aperture-

grille tube such as Mitsubishi's Diamondtron NF or Sony's FD Trinitron must purchase the tubes directly from Mitsubishi or Sony. Both companies charge premium rates for their tubes, ostensibly to account for the extra manufacturing expense. However, some observers think the price isn't due only to the manufacturing process. "Products with an FD Trinitron or Diamondtron NF tube tend to command a premium in the market," says Jim Witkowski, chief hardware engineer for Cornerstone Monitors, "At least some of the premium is due to the brand name," he added.

Manufacturing a display for use at high-

#### **Cost Analysis**

SEVERAL FACTORS determine whether a monitor is costly to manufacture.

#### FOR INVAR SHADOW MASK AND APERTURE GRILLE MODELS:

- TCO compliance
- Certain parts that have to be tuned by hand, incurring labor costs
- Extras such as color- or image-adjusting software, built-in speakers, or USB ports

#### FOR APERTURE GRILLE MODELS ONLY:

- Heavy frame that requires more metal
- Flat-screen tubes, with curved glass at inside corners of display, that require a complicated manufacturing process

er resolutions and refresh rates can also incur labor costs that carry over into the overall cost. Witkowski explains that certain aspects of the manufacturing process must be performed manually. A high level of skill is required, for instance, to tune convergence rings at the back of the CRT. While the process might be quick for a 15inch model, it isn't for a 21-inch CRT. "It's difficult to keep the image sharp, and thus [different] companies that use the exact same tube can have dramatically different quality levels," says Witkowski.

Compliance with standards such as TCO'99 also plays a role in raising costs. TCO'99 requires monitors to meet strict emissions limits and to use recyclable parts, among other things. Cheaper models use shielding, but not enough to meet TCO's strict standards. All but one of the monitors on our chart are TCO'99 compliant. Optiquest's Q115 complies with the older TCO'92, which is less stringent regarding the use of recyclable parts.

Other cost factors are the extras a monitor may come with, such as USB ports, color- or image-adjusting software, and advanced on-screen controls.

Is paying for a costly high-end monitor worth it? According to Alexander, it can be. "Users would be smart to spend a little extra to get a monitor with a flat face. It's well worth the price," she says. Witkowski doesn't agree. He insists that Trinitron and Diamondtron tubes don't offer significantly better performance than shadow mask tubes. However, in our tests we found that pricier flat-screen monitors outperformed shadow mask monitors.



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not the most compact monitor we tested. Be prepared to make some room on your desk for its bulky frame.

What Else: The controls for the SyncMaster 950p reside in a convenient, retracting panel on the bezel. Rotating through the menus and making adjustments to the picture proved simple. The display's advanced controls include horizontal and vertical moiré compensation (to reduce the swirling patterns that occur when a monitor is used at refresh rates and resolutions higher than those for which it is optimized). If you use image editing software, you'll like the 950p, because it can achieve a resolution up to 1920 by 1440 at 70 Hz, which lets you see more



of your photos and your image editing program's toolbars. Upshot: With generous features and wonderful image quality for a very reasonable price, the SyncMaster 950p would make an outstanding choice for word processing and graphics uses.

#### [2] Samsung SyncMaster 700NF

Best What's Hot: Despite competing against 19- and 21-inch heavy-hitters that boast more screen area, the 17-inch SyncMaster 700NF held its ground, rendering extremely sharp text and beautifully nuanced graphics. Its top-notch text and image quality made it one of only two models on the chart to attain a score of Excellent in both categories. It's not the cheapest 17-inch model available, but at \$279 it's still a good value.

What's Not: At 43.4 pounds, the SyncMaster 700NF earns the distinction of being the biggest and heaviest 17-inch unit we tested, though it does weigh less than 19-inch CRTs, which average around 52 pounds.

What Else: The SyncMaster 700NF uses Mitsubishi's Diamondtron NF flat-screen tube, and it costs at least \$70 less than all the other competitors we tested that use the same tube. As on Samsung's SyncMaster 950p, a nifty retracting panel on the front bezel holds easy-to-use on-screen controls.

**Upshot:** Whether you plan to crank out spreadsheets or edit images, the SyncMaster 700NF would make a superb choice.

#### [3] Sony CPD-G220S

What's Hot: Like the SyncMaster 700NF, the 17-inch CPD-G220S garnered an Excellent score for both text and graphics performance. The manual for the CPD-G220S includes helpful troubleshooting tips and clear instructions for all on-screen controls. This monitor's flat screen helps reduce glare.

What's Not: Top-notch image quality frequently comes at a stiff price—in this instance, \$370.

What Else: The on-screen controls for the CPD-G220S are easy to navigate, thanks to a joystick on the front bezel that can be pushed up, down, or in. Adjusting the controls themselves can be slightly confusing, however, so you may want to keep the manual close at hand.

**Upshot:** The Sony CPD-G220S is well suited for any application you might throw at it, whether you do heavy graphics work or word processing. Just be willing to shell out a little extra cash for its top-of-the-line image quality.

#### [4] ViewSonic GS790

What's Hot: The 19-inch GS790 excelled at rendering graphics. Colors shone brightly, particularly in photos. With a very short depth of only 16.2 inches, it occupies much less desktop space than any other monitor its size in our test; only the 17-inch Acer G773 (which didn't make the chart) is as short. And at \$315, the GS790 is a great value for those on a budget.

What's Not: The GS790 stumbled slightly when displaying text. At smaller point sizes, text proved a tad more difficult to read than on the best-scoring monitors, causing the judges to dole out slightly lower marks.

What Else: The comprehensive documentation for the View-Sonic GS790 covers all the basics and includes clear defini-





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tions of all on-screen controls—which is a good thing, because we didn't find adjusting the controls to be very intuitive.

Upshot: A short case design and impressive graphics quality make the GS790 well suited for high-level imaging work in

tight spaces. And at just \$315, the unit won't set you back too much.

#### [5] KDS VS 195i

What's Hot: The VS 195i's \$259 price makes this 19-inch model the least-

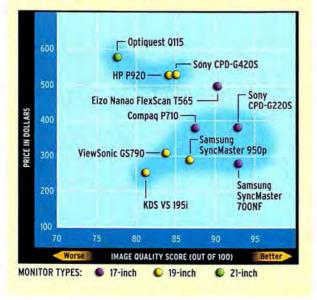
expensive monitor on the chart; the only models that cost less were low-end 17-inchers. Text on the VS 195i looked sharp and was easy to read at small point sizes.

What's Not: Displaying graphics isn't this model's strong point: The VS 195i's graphics score was lower than those of the other 19-inchers that made the chart. Colors on photos and on Web pages didn't look nearly as bright as they did on other displays. A lack of controls for focus and convergence (which adjusts how red, green, and blue pixels align) makes this model a poor choice for graphics professionals who need to make fine adjustments. While other models come with daily 24-hour sup-

BEST VALUES

## Price vs. Performance

YOU DON'T HAVE TO PAY through the nose to get top-notch image quality. Thanks to falling monitor prices, you can now buy a 19-inch model that performs better-yet costs less-than some 17-inch displays. The clouds indicate where price and performance overlap. The best values-those monitors that provide the best performance at the lowest price-are located in the lower-right portion of the chart.



port, KDS works the phone for 11 hours, Monday to Friday. What Else: Despite leaving out some expected controls, the VS 195i does include controls for zoom and moiré. One easy-torotate button on the bezel lets you adjust all the settings.

#### YOU CAN NOW CHOOSE A 19-INCH MONITOR THAT COSTS LESS THAN MANY 17-INCH DISPLAYS.

Though the monitor's documentation is fairly well organized, it doesn't include a troubleshooting section.

**Upshot:** The VS 195i's appealing \$259 price, sharp text, and large display area make it ideal for buyers on a budget, but due to its slightly subpar graphics and its lack of some key controls, we don't recommend it for professional graphics use.

#### [6] Compag P710

What's Hot: The 17-inch P710 displayed crisp, legible text and vivid images in our tests, which helped it earn a score of Very Good in both categories. Judges noted the P710's competency in displaying spreadsheets and Web pages; it rendered both sharp lettering and vibrant colors.

What's Not: The \$379 price tag will dissuade buyers for whom price is the main concern, even though that buys a Mitsubishi Diamondtron NF flat-screen tube. Note that the Samsung SyncMaster 700NF uses the same tube and achieves superior image quality for \$100 less.

What Else: The display of on-screen controls times out within seconds, and the time-out is not adjustable, so you have to keep pressing the menu button to bring the display back up. A handy fine-picture button on the bezel allows you to rotate through several modes suited for different tasks, such as working with graphics or viewing DVDs, by adjusting the color temperature from 9300 Kelvins to 6500 Kelvins.

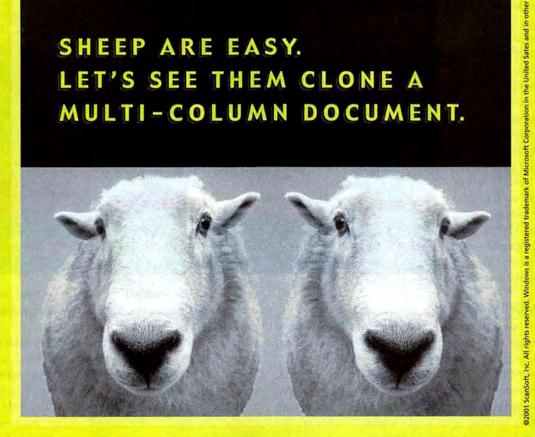
**Upshot:** The P710 handles both text and graphics ably, so business users looking for a 17-inch display and willing to spend a little extra for a flat tube should be very satisfied.

#### [7] Eizo Nanao FlexScan T565

What's Hot: The 17-inch T565 has graphics display down pat: Colors in photos and Web pages looked lovely. This monitor also managed to deliver finely detailed text quite well; fonts at small point sizes were easy to read in a Word document. The T565 also includes a USB port, so you can attach peripherals such as digital cameras and scanners without having to crawl behind your computer.

What's Not: Be prepared for sticker shock: The T565 costs \$499—\$129 more than the 17-inch Sony CPD-G220S, which outscored it on both text and graphics. It also costs more than most of the 19-inchers we tested. Its high price is likely due to its FD Trinitron flat-screen tube. Also, Eizo provides only

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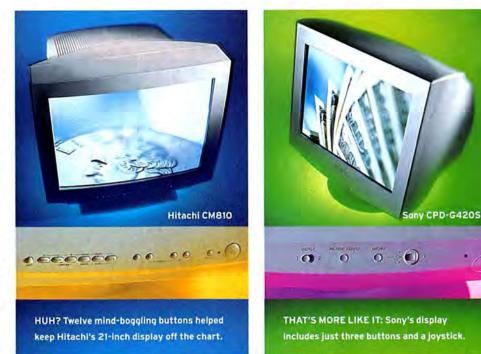
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What Else: A button on the front bezel allows you to choose from five modes such as text, picture, or movie—to alter the color temperature; the modes help to optimize the display for anything from word-processing documents to DVD movies.

Upshot: Notable image quality and useful extras make the well-appointed Eizo Nanao T565 suitable for text or graphics use, but its high cost keeps it from being the best value.



#### [8] Sony CPD-G420S

What's Hot: Sony's 19-inch CPD-G420S rendered sharp letters in our test spreadsheet, and crisp icons on a Windows desktop. This model's deep, accurate colors were also striking.

What's Not: At \$530, the CPD-G420S isn't for penny-pinchers. For that money, users looking for even more viewable area could trade up to one of the 21-inch displays we tested, though those models sacrifice some image quality. In addition, the CPD-G420S omits extras such as USB ports.

What Else: Like the 17-inch CPD-G220S, this Sony model lets you adjust settings with an easy-to-use knob on the front bezel. A picture-effect button toggles between standard, dynamic, and professional modes, altering color temperature for various types of text or graphics applications. Despite leaving out some extras, the unit does have a built-in speaker.

**Upshot:** The CPD-G420S is well suited for heavy word processing or professional graphics work, but other monitors on our chart perform better and cost less.

#### [9] HP P920

What's Hot: Hewlett-Packard's 19-inch P920 rendered pleasing color and delicately detailed graphics, along with fine, clear text. Like Samsung's SyncMaster 950p and Sony's CPD-G420S, the P920 can achieve a maximum resolution of 1920 by 1440 (at 70 Hz), making it ideal for viewing big spreadsheets.

What's Not: The pricey P920 costs about the same as the num-

#### **Off the Chart**

PLEASE SEE find.pcworld.com/ 10722 for reviews of monitors that didn't make the chart. ber eight Sony CPD-G420S does, and it too lacks extra features such as USB ports and colorand image-adjusting software. Also, HP provides technical support only 11 hours a day. That may be adequate for business users, but small-office and home users might feel left out in the cold.

What Else: The P920's controls are a bear: You must work with six different buttons to make adjustments, which we quickly found frustrating. For instance, when trying to increase brightness, we pressed the wrong button—it reduced the brightness level. The documentation comes only on a CD-ROM.

**Upshot:** Confusing controls and a luxury price—albeit for above-average image quality—make this 19-inch display destined for professional graphics users.

#### [10] Optiquest Q115

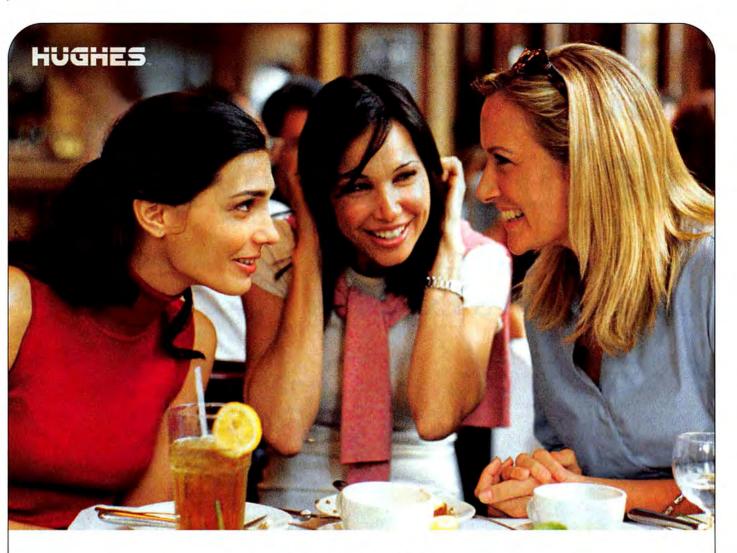
What's Hot: The sole 21-inch display on the chart, the \$578 Q115 is a bargain for those who desire a large viewable area. The Q115 outdid its fellow 21-inch competitors in our graphics tests, rendering noticeable detail in photos.

What's Not: This big display won few fans for its text: Compared with text produced by the top 17-inch models, the Optiquest Q115's letters looked slightly blurry.

What Else: Unlike most of the other monitors in our chart, the Q115 allows you to set its on-screen controls to display for more than 4 minutes—a useful extra, given that most models' control displays time out very quickly. Controls can be adjusted with a simple scroll wheel that lets you rotate through menus and make changes.

**Upshot:** The Q115 would make a great addition to the desktop of a budget-minded buyer who needs lots of viewable area. However, if you need the kind of performance and extras that the high-scoring 17-inch and 19-inch monitors on our chart offer, this isn't the model for you.

Kalpana Narayanamurthi is an associate editor at PC World.



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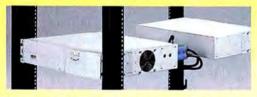
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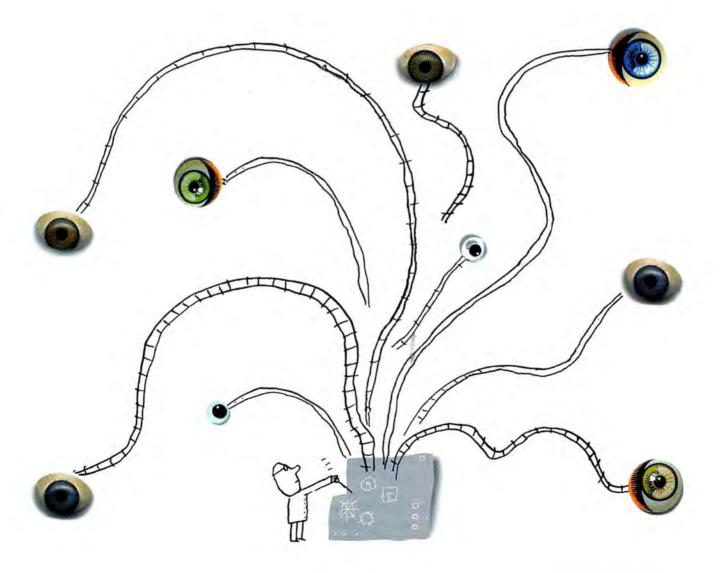
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time you want to spend searching on the Web. Along with its billions of pages of information, the Web now serves up video and other media—resources so diverse that you need a team of sites to find what you want: an omnibus search engine, plus specialized search services for specific tasks. We tested both types: General search engines appear in this section and specialty search sites on page 114.

Much has changed since our examination of Web search services exactly one year ago (see "How to Stop Searching and Start Finding," find.pcworld.com/10900). Consolidation is the word you hear most often from search engine experts about trends in the industry. "We're likely to have fewer search engines and search portals," says Danny Sullivan, editor of SearchEngineWatch.com. "If the search engines don't figure out a way to make money, they're just going to quit." Recent casualties include Magellan and InfoSeek, two of the Web's earliest search services.

Sullivan and other analysts see more search services following Iwon and Go in adopting a pay-for-placement model. "Every major search engine has some form of paid placement," Sullivan says. He adds that users should be concerned if they find it difficult to distinguish between the search results listings that are paid for and those that aren't.

Search technology has advanced, too. For example, Google now performs full-

#### SULTAN OF SEARCH

Last year's search engine champ retains its crown by serving up the links you're looking for in an interface that is a model of simplicity and efficiency. One of several enhancements to the engine is the ability to perform full-text searching within files in Adobe Systems' Portable Document Format.

Google

text searching within files in Adobe Systems' Portable Document Format—used to post many government documents and corporate white papers. Chris Sherman, SearchEngineWatch.com associate editor,

believes the inclusion of PDF files signifies that the "invisible Web" is shrinking. The invisible Web refers to pages that engines—for whatever reason—don't index, like sports scores and other information of momentary interest, as well as databases and other non-HTML content.

Technology improvements also mean that

search results are less likely to include dead links (links to pages that no longer exist or that have been moved), and they are more likely to place the relevant link at or near the top of the first page.

But while some sites have improved, others seem to have gotten worse. The Open Directory and MetaCrawler, our favorite directory and metasearch engine last year, didn't perform as well in our tests this year—in fact, the Open Directory did so poorly that it didn't even make it onto our chart of the top 12 services. Google remains our Best Bet; it's our flatout favorite of all search tools. Close behind is Fast (www.alltheweb.com). And leading the directory pack are longtime favorites Yahoo and Lycos.

In our tests, we evaluated search sites based on five criteria: relevance, advanced features (such as the AND, NOT, and OR Boolean operators; see "The Tricks of the Search Trade" on page 113 for information about these), the site's ease of use, its percentage of dead links, and the freshness of the results it returned (based on how well a site did at returning pages about a current topic). And because a good search site makes it easy for you to pose your query and get to relevant Web pages quickly and simply, we awarded extra points to sites that gave us a correct page within the first five links. For our complete test results, see the chart on page 111.

We looked for data in five categories: product information (reviews of Pioneer DVD-Recordable drives), business re-



ALTAVISTA'S ADVANCED search options let you sort search results based on the words you used in your search phrase.

> sults (Cisco's first-quarter 2001 revenue), technology specifications (the maximum data transfer rate of the Universal Serial Bus 2.0 standard), regional data (room rates at the Agate Cove Inn bed-andbreakfast in Mendocino, California), and obscure facts (the author of an outof-print 1920s sci-fi novel, *Eater of Darkness*). We tested the freshness of the results by asking a question that was topical at the time of our tests.

> Relevance and ease of use proved a mixed bag: Some of the services with the cleanest interface (MetaCrawler, for example) didn't score well in relevance, while some that overflowed with ads and options returned a relevant result among the first five links. Overall, we were pleased with the advanced search tools and techniques the engines and directories offered; for many searches it pays to put a little effort into your query.

Keep in mind, however, that no one test can serve as a definitive basis for ranking competing search engines. Your experience will vary depending on search topic.

#### **ENGINES VS. DIRECTORIES**

IN THEIR SIMPLEST FORM, search engines rely on machines to gather responses to searches; directories, on the other hand, are created by humans. Although search engines may index more than a billion Web pages, directories rarely include references to more than a million.

Google, Fast, AltaVista, and other search engines use a program known as a spider to scan and record the contents of Web pages. The spider collects a page's title and other information stored in its HTML code, and then it follows links on the page to gather information about those pages as well. Spiders are set to exclude certain words (such as articles and prepositions), and they "time out" after a specific period to avoid being trapped on a single Web page or site. That timing out means large Web sites are rarely completely spidered.

The information the spider collects is compiled into an index-something akin to a library's card catalog. When you enter a query at a search engine site, the engine searches its index and returns links to pages that seem to match your query. Of course, what the engine deems relevant may not match what you think is relevant.

Web directories, such as Yahoo, Lycos, Excite, and LookSmart, collect sites with a spider or receive them as submissions from site owners. Then directory editors sort through the sites and put them in a database arranged by topic. You can either search the database using the site's search engine or click through the site's category tree until you find the topic you want.

Directories usually include query results from one or more search engines in their results page. (The reverse is also true: Google offers results from the Open Directory.) For example, Yahoo's 🕨

#### FEATURES

#### **BIG-NAME SEARCH ENGINES GO TOE-TO-TOE**

SERVICE	Type of service	Relevance score	Advanced- features score	Ease-of-use score	Dead-links score	Currency score	Comments
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Ask Jeeves www.ask.com	Directory	Poor	Not applicable	Fair	Good	Poor	Natural-language site returned too many home-page links and too few direct links to the information. Has no advanced search features. $\star \star$ statistics
Dogpile www.dogpile.com	Metasearch	Good	Good	Fair	Good	Poor	Unlike other metasearch engines, Dogpile divides results by the sites it gathers them from, which makes them less useful. $\star\star\star$
Excite www.excite.com	Directory	Fair	Good	Fair	Good	Poor	You must conduct a basic search to access the service's advanced features. Obscure- topic search turned up adult-site links. ★★↑☆☆
Fast www.alltheweb.com	Engine	Good	Excellent	Excellent	Excellent	Excellent	Excelled in all categories except our obscure topic. Had the best percentage of correct answers with the first result, and returned few dead links. $\star$
Best Google BET www.google.com	Engine	Excellent	Excellent	Excellent	Good	Excellent	Still the champ: Produced relevant returns in every category. Has an easy-to-use interface. ★★★★
HotBot www.hotbot.com	Metasearch	Good	Excellent	Fair	Good	Poor	Best metasearch site for business, product, and technology searches, but results were not as relevant as those of the pure search engines. $\star$
LookSmart www.looksmart.com	Directory	Poor	Not applicable	Fair	Good	Poor	Recently switched to a pay-for-placement model. Tanked on most of the tests. Works better as a directory than as a pure search engine. ** transfer
Lycos www.lycos.com	Directory	Good	Excellent	Fair	Excellent	Excellent	Highest-rated directory benefits from using Fast as its search engine. Offers better interface and advanced search features than Yahoo. $\star$
MetaCrawler www.metacrawler.com	Metasearch	Poor	Fair	Good	Excellent	Poor	Struggled with our search terms. Works better when searching for general information. ★★ desired
Northern Light www.northernlight.com	Engine	Good	Good	Fair	Good	Good	A researcher's favorite. Did better in the tests when we used its advanced features. Includes links to reports and articles it charges you to access. $\star$
Yahoo www.yahoo.com	Directory	Excellent	Excellent	Fair	Good	Excellent	Benefits from using Google as its search engine. Portal features may distract you from getting your information quickly. ★★★☆☆

For more details on PC World's Star Ratings, see find.pcworld.com/10860. HOW WE TEST: We rate the performance of the engines in each of five categories: relevance, advanced features, ease of use, percentage of dead links, and freshness of the links returned. The relevance score is an average of the test results in five subcategories: product information, company information, test results on line at find.pcworld.com/10860. You'll find our complete test results online at find.pcworld.com/10860.

search results combine pages from its directory with results on the same topic from Google's search engine, though you won't get all of Google's results on a topic at Yahoo. Lycos mixes the results from its directory with Fast's search engine results. Metasearch engines, such as Dogpile and MetaCrawler, send your query to several directories and search engines, and then aggregate the results.

Because search engines index so many more pages than directories do, you're more likely to get hundreds of results when you search for something general, such as *Ford Mustang*. A rule of thumb: Use directories when you're looking for general information or when you're not sure where to begin, and use search engines when you're looking for a specific piece of information. If you use a directory that is integrated with a search engine,

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GOOGLE'S RESULTS pages balance an uncluttered design with useful extras, such as cached pages and similar links.

or if you use an engine that includes a directory, you don't necessarily get the best of both worlds because each can water down the strength of the other.

#### **EVERYTHING IS RELEVANCE**

REGARDLESS OF HOW many pages a search site indexes, the relevance of the first results is what matters. Each search site determines relevance differently, so even if two engines produce the same link in their results, the link may not appear at the top of the page in both lists. Most search engines base relevance partly on where your search term appears on a page: A position high on the page translates into a higher relevancy score.

Both Google and Fast rank a page's relevance, in part, on the number of other sites that

link to it. They theorize that if many sites link to a particular page, it must have greater value to people looking for information on that topic. Judging from our test results, we think Google and Fast are right.

All is not perfect in search engine land, however. The refinements don't guarantee that you'll find what you're looking for right off the bat. For example, when we entered the relatively straightforward *cisco* 

> first quarter revenue 2001 to retrieve links to pages listing Cisco Systems' firstquarter revenues in 2001 (which were \$6.5 billion), we saw many pages that reported earnings from other companies (most of which did business with Cisco), plus several older and newer Cisco revenue reports. Only half of the search sites linked us to a page with the answer in the first 20 results, which we consider a reasonable number of links to peruse. In our obscurity test, we searched to find the author

of Eater of Darkness. We

got links to pages about *The Hasheesh Eater* by Fitz Hugh Ludlow, and *Confessions of an English Opium Eater* by Thomas de Quincey. We also got links to several *Dr. Who* fan pages and to a vampire site or two. If you try this search at Excite, you may want to send the kids to bed first the word *eater* seems to appear on an awful lot of X-rated adult sites. The correct answer, found by both Google and Yahoo, is Robert Myron Coates.



THE CLEAN, STREAMLINED home page at Fast doesn't get between you and what you're looking for.

Directories such as LookSmart mix feepaying sites with nonpaying results. This practice is in addition to the "featured links" box at the top of the results page. LookSmart and others let sites pay to have more of their pages included in the listings. LookSmart claims that this gives researchers more resources to draw on, but the site's poor scores in our relevance tests indicate that doing so hinders your chance of getting relevant links for your queries. LookSmart did well in our technology specifications category, however.

#### ADVANCED SEARCH PAYS OFF

YOU CAN HELP search engines do their job by using advanced search features. Some search sites automatically apply these techniques for you. For example, some search engines add the Boolean operators OR and AND automatically when you enter a multiword search.

Several engines offer forms and dropdown menus for honing your results. For example, Excite, Fast, Google, HotBot, Lycos, and Yahoo let you choose to view only pages containing your exact search phrase, pages that have all your phrase's words in any order, or pages with any of the words in your search phrase. Alta-Vista lets you sort your results by ranking the words in your search phrase.

In our tests, most search sites returned better results when we used advanced functions. The exceptions were Google (which couldn't improve because it recorded perfect scores in our basic tests) and Yahoo (which also scored well in the basic tests). LookSmart and Ask Jeeves do not support advanced searching.

It's important to use the right advanced

technique, however. When we looked for *Eater of Darkness*, only Google and Yahoo returned a correct result within our test parameters (usually the first 20 links returned). The other sites failed to find it even when we inserted *ANDs* between the search terms. When we searched for the exact phrase *eater of darkness*, however, every site except Northern Light and MetaCrawler produced a correct result, generally within the top five links.

#### LOOKS COUNT

WHILE THE RELEVANCE of results is crucial, a site's interface and help features also matter. The best sites offer such features as a drop-down list of search delimiters ('.mp3s only', for example) without cluttering the page. Sites that returned the most-relevant answers also scored well for their interface. Google and Fast use nomuss, no-fuss designs: Their home pages show little more than a search field and a link to the results. On the other hand, Yahoo's cluttered interface combines a search field, directory categories, news, shopping links, and more.

Not all directories are that distracting, however. For example, the small amount of extra information that appears on Lycos's home page is presented clearly. Similarly, among the metasearch sites, MetaCrawler is helped by its simple-yetfunctional graphical interface, while Hot-Bot's neon green will have visitors rushing to their Back button.

The true test of a site's interface is its results page. Ask Jeeves and MetaCrawler hide their results among ads and other clutter, while LookSmart and Excite fail to provide such useful, basic information as the full URL of the site that the included link leads to.

The best results pages balance clean interfaces with worthwhile extras, such as a search field that allows you to refine your search results by adding or deleting words. Google provides a link to a cached copy of the page so you can view it if the link to the live page isn't working.

#### SEARCH TIPS

## the **tricks** of the search trade

FINDING A GOOD search engine is only half the battle. You also have to know how to use it. Here are some tips for getting the most out of your queries.

Read the instructions: Most search sites tell you how to get the best results using their engine, so read before you search.

Be specific but concise: Include sufficient search terms to get the links you want at the top of the list. Too many terms can push the page you want to the bottom, however. Start with a few terms, then add or replace them one at a time to get better results.

Go Boolean: The Boolean operators AND, OR, and NOT let you include or exclude pages based on their content. For example, searching for Sopwith AND Camel AND Snoopy yields pages about the Peanuts character's escapades as a World War I flying ace; Sopwith AND Camel NOT Snoopy blocks out most Peanuts-related pagesprovided the engine recognizes the NOT operator.

only

and

The Google advanced search page automatically includes the AND operator in its 'with all of the words' field, the NOT in the 'without the words' field, and the OR in the 'with any of the words' field.

Some search engines, such as AltaVista, Lycos, and Fast, replace AND and NOT with + and -, respectively. To find only pages that discuss both the Dalai Lama and Bill Clinton, for example, you'd type +Dalai +Clinton (with a space be-

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tween Dalai and the second +). Search Engines Showdown's Search Engine Features Chart (www. searchengineshowdown. com/features) identifies the Boolean terms each engine supports.

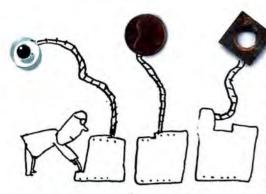
Add quotation marks: To find pages that mention W.C. Fields but not water closets or farmland, put quotation marks around your search term: "W.C. Fields". This instructs the engine to treat multiple words as a single term.

Use field specifiers: Some search engines support field specifiers-keywords that tell the engine to perform specific kinds of searches. For example, typing site:pcworld.com limits the results to pages on PC World's site; link: microsoft.com will give you pages on sites that link to Microsoft's site. Using url:weasel will produce only sites that contain the word weasel in their Web addresses. To see which specifiers a particular engine supports, read the site's advancedsearch instructions.

-Scott Spanbauer

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TO REDUCE THE NUMBER of results returned, focus your search by using Google's advanced techniques.



## specialty searches: sites and tools

Sometimes, to find valuable nuggets on the Net, you have to call in the specialists.

MOST OF WHAT you want on the Net you can find with a general search engine. The rest of the time, though, you'll come up with nothing or with way too many results. Fortunately, you can use topicspecific search engines and tools to focus on a subset of the Web or to gain access to online data that's otherwise not available. Specialty search services index only Web pages that cover a specific topic, omitting material outside that scope.

#### **PEOPLE FINDERS**

WHEN IT COMES to finding a person, the Web is the place to be. Google displays phone numbers and addresses when you search for a combination of the person's name, zip or area code, city, and state (www.google.com/help/features. html#wp). Lycos's Whowhere (whowhere. lycos.com) lets you look for a phone number, an e-mail address, or a Web reference, and sometimes it provides a street address in the bargain. The service's advanced phone-search page features handy links to dozens of international phone directories. The site 411 Locate (www.411locate.com) looks for phone numbers, e-mail addresses, and street addresses, and it even offers reverse phone-number lookups.

Bigfoot (www.bigfoot.com) lets you do still more with street addresses. Clicking

the street name whisks you to a directory of nearby locations. And Switchboard (www.switchboard.com) provides a map of an address and a list of nearby restaurants and hotels.

#### SIGHTS AND SOUNDS

TEXT HAS ITS PLACE, but the Web comes alive with images and music. These sites will help you find them.

Photo finders: AltaVista's image search site (www.altavista.com/sites/search/ simage) can find photographs of such obscure subjects as Japanese archery. Excite (www.excite.com/search\_forms/ photosearch) lets you search the online photo collections of other Excite members, as well as recent Associated Press and Reuters news photos. ImageFinder (sunsite.berkeley.edu/imagefinder) is the University of California at Berkeley's directory of ten image databases, including some at the Smithsonian Institution and NASA. If it's fine art, design, and architecture you're after, go to ADAM (adam. ac.uk), a librarian-edited catalog of over 2500 online image databases. Want stock photos? Random Eye Technologies' Image Grabber (imagegrabber.randomeye.com) lets you search online stock-photography sites, once you've completed registration.

Virtual video: Lycos's multimedia search page (multimedia.lycos.com) finds troves of photos, but it doesn't stop there. The site's VideoCenter page (video.lycos.com) is a directory of streaming video clips created by other VideoCenter members. To search the Web for video clips, try Alta-Vista's Video Search page (www.altavista. com/sites/search/svideo). StreamSearch (www.streamsearch.com/radiohome.asp) also scours the Web for streaming audio and video clips that match search criteria.

Napster-less MP3 sources: If you're looking for MP3s, start with AltaVista's Audio Search engine (www.altavista.com/sites/ search/saudio), which now puts Napster to shame. Lycos Music (music.lycos.com/ downloads) combines music downloads with links to recording artists' Web sites. AudioGalaxy (www.audiogalaxy.com) boasts lots of downloads, but you have to download a utility to get them from other AudioGalaxy users. Fast's multimedia search is another good source for MP3s.

#### 'OUR TOP STORY TONIGHT ....'

MOST GENERAL-PURPOSE search engines spider the Web too infrequently to provide up-to-date news. Search sites specializing in news tend to be more current, but they may not cover many news sources or



IF YOU JUST CAN'T FIND the image you need, try searching several stock-photography sites at once by using Random Eye Technologies' Image Grabber service.

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let you search far back for stories.

Lycos News (www.lycos.com/news) serves up recent Reuters, AP, and Wired News stories. Don't bother looking for stories older than a week, however. Paradigm News Search from TotalNews (www.totalnews. com) lets you query the BBC News and Washingtonpost.com. Northern Light (www.northernlight.com/ news.tml) lets you search within one or more of a dozen categories, including business, sports, and weath-

er. This feature is convenient if you want disparate pieces of information—such as the latest Colorado Rockies baseball score and the weather forecast for Vail, Colorado—in a single search. The site encompasses a greater range of newswires than does Lycos's service, but you won't find material older than two weeks.

Moreover (www.moreover.com) offers a broad range of news sources but only covers stories a day or two old. For a less mainstream view of the news, browse News Is Free (www.newsisfree.com/ sitesearch.php3), an interesting and highly customizable directory to current stories on the Web from international, alternative, and mainstream sources.

If you want to read about older news, visit Excite's NewsTracker (nt.excite.com). And finally, if volume's what you're looking for, InfoJump (www.infojump.com) claims to have an index of over 5 million articles from 4000 online publications.

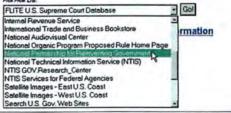
#### **PUBLIC-SECTOR SEARCHING**

NO SINGLE ENTITY cranks out more sheer verbiage than the U.S. government, so it's no surprise that numerous search engines are dedicated to keeping tabs on this online outpouring. FirstGov (www. firstgov.gov), from the General Services Administration, claims to search every word of every U.S. government document (30 million pages' worth), while also digging up lots of state and local government information. Usgovsearch (usgovsearch. northernlight.com) lets you search the Web or its own collection of governmentrelated publications. If you like, you can



Web Site Revised Friday, 2000 February 4 File, Jobs and Web Databases Updated Daily

#### Browse the FedWorld Information Network



THE DEPARTMENT OF COMMERCE'S FedWorld site lets you search several government databases at one time.

limit your searches to a particular agency or branch of government. FedWorld (www.fedworld.gov), a production of the U.S. Department of Commerce, offers a browsable list of federal government databases, including Supreme Court decisions, FAA regulations, and IRS forms. You can also search a huge number of government reports. Even Google gets involved in the action with a version of its service (www.google.com/unclesam) that searches U.S. government sites only.

#### **NEWSGROUPS AND FORUMS**

SOME OF THE BEST information on the Web bubbles up in Usenet newsgroups. The premier site for newsgroup prospecteditors. Ask Jeeves for Kids (www. ajkids.com) invites children to ask natural-language questions, such as Why is the sky blue? KidGrid (www. kidgrid.com) is yet another directory designed especially for kids. Kids-Click (kidsclick.org) offers separate search fields (www.kidsclick.org/ ksearch.html) for several authoritative online dictionaries and encyclopedias, as well as a host of other youth-oriented Internet resources.

#### SEARCH FOR SEARCH ENGINES

still CAN'T FIND what you're looking for? Try a search engine directory. Search Engine Guide (www.searchengineguide. com) is a service that allows you to search for search engines dedicated to particular topics. Argus Clearinghouse (www. clearinghouse.net), Beaucoup (www. beaucoup.com), and Search Engine Watch (www.searchenginewatch.com) offer directories of specialized search engines as well. SearchAbility (www. searchability.com) is a huge directory of search engine directories. (It's only a mat-

#### STILL CAN'T FIND WHAT YOU'RE LOOKING FOR? TRY A SEARCH ENGINE DIRECTORY.

ing is Google Groups (groups.google. com), formerly known as Deja.com. With an archive of thousands of newsgroup postings going back to 1995, there are few nuggets of wisdom you won't find there. For a list of online communities go to Forum One (www.forumone.com/index).

#### **KID-SAFE SEARCHES**

TO KEEP YOUR CHILDREN from stumbling across adult material while searching the Web, steer them to a search site designed with kids in mind. Yahooligans (www.yahooligans.com) is a directory of child-safe Web sites selected by Yahoo ter of time before there's a directory of search engine directory directories.)

Some online information doesn't show up in any search engine. The information may be stored in a database, the site may require that you log in, or the site may simply block search engine indexing. Lycos's Searchable Databases directory (dir.lycos.com/reference/searchable\_ databases) puts many of these otherwiseoff-limits resources at your disposal.

Michael Gowan is a freelance writer based in Oakland, California. Scott Spanbauer is a PC World contributing editor. YEARS OF INNOVATION



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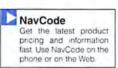
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Attention, Web shoppers: Here's how to find bargains on PC products without getting snared. BY ANNE KANDRA PHOTOGRAPHS BY

CHIP SIMONS

The Truth About Low Prices

DON'T YOU LOVE a great deal? The Web's brimming with them. But bargain hunters, beware: The Web is also rife with dark alleys and seamy storefronts. To explore the danger zones, I went on an Internet shopping spree along with a team of *PC World* editors, sniffing out the best prices for tech goodies and separating the deals from the ordeals. We bought PCs, digital cameras, software, and more. We looked behind the ratings and seals of approval attached to some merchant sites. And when possible, we returned purchases for a refund. After we got our money back, we concluded that the best price doesn't always mean the best deal. Here's how to avoid trouble and locate the real deals online.



## Bots Find Good Buys? Not Always

WHEN IT COMES TO ferreting out low prices, a shopping bot has a better nose for the bottom line than your coupon-clipping great aunt. We *PC World* shoppers used lots of bots to home in on low prices—and they turned up some seemingly stellar deals. In fact, some of us were thrilled with our cheap buys. But bots don't always tell the full story, and many of the deals lost their shine when we looked beyond the surface. The lowest prices are often offered by small, relatively obscure vendors, not by the big names. And that's when you need to be careful.

Case in point: my digital camera purchase. I sent MySimon (www.mysimon.com) in search of a Nikon Coolpix 880, and the bot came back with a best price of \$598 offered by Comp-Direct.com (www.compdirect.com)—about \$100 cheaper than other listings. I went to the site and saw that the Nikon camera was in stock, but when I started the checkout process, the site informed me that "for security purposes" I needed to call a tollfree number to complete my order. My call was answered by a pushy salesperson named Rob, who said that CompDirect.com wasn't offering that model anymore. (During our shopping period, Nikon told us that the Coolpix 880 was still in production.) Instead, Rob sold me a pricier, refurbished Coolpix 990 and eight accessories. Two-day shipping charges set me back another \$30, and Rob tacked on \$41 more for insurance. I subsequently placed several calls to CompDirect.com and never got the same overall price twice. My total? About \$1500.

The camera arrived in three days, with everything intact. However, we brought the merchandise to a local camera store, and one of its experts noted that the filters and lenses were of inferior quality. Plus, you could find better prices for all the items elsewhere (see the chart on page 122 for details of a similar purchase). Obtaining a return merchandise authorization number was easy, though I had to eat over \$250 in restocking and shipping charges. I received a refund two weeks later.

We also used bots to hunt for cheap software. They didn't do well, so we had to locate better prices on our own. We checked magazine ads and auction sites, and we ran searches with engines like Google, looking for cheap versions of Microsoft and Corel software. In some cases we received legit software, but in others we got illegal versions. *PC World*'s Ed Albro, for instance, won an auction on EBay (www.ebay.com) with a bid of \$355 for Microsoft Office 2000 Premium (normally it costs \$495 or more). The software appeared bearing a sticker stating "Promotional Sample, Not for Resale." The software worked fine, but according to Microsoft, an owner of a promo sample can't register the product and isn't eligible for upgrades or tech support. To top it off, Albro forked over \$15 to the seller for priority shipping, but the post office label put the expense at \$3.95.

#### **USE BOTS WITH CAUTION**

BLAME FOR SUCH SHOPPING problems lies with merchants, of course, not with shopping bots. But when a bot steers you to superlow prices, don't believe all the promises. If you're considering buying from a site you don't know, check out customer feedback at ResellerRatings.com (www.resellerratings.com) or RatingWonders.com (www.ratingwonders.com). If a mer-

## BARGAIN HUNTER ALERT: Tips for Safe Shopping

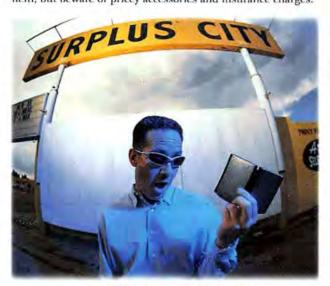
EVERYONE KNOWS the adage: If something looks too good to be true, it probably is. If you're on the hunt for unbeatable prices, arm yourself with those words of wisdom, plus our top tips, and you'll avoid getting ripped off.

#### 1. Know What You Need

Before you hand over your credit card number, figure out exactly what you want. Determine what components come standard with your purchase. You're less likely to be talked into buying pricey accessories you don't really need. 2. Use Lots of Shopping Bots Dispatch at least three bots every time you shop. Since each bot scans its own pool of sites, you'll be presented with a wider range of vendors and prices to choose from. 3. Research Your Retailer

Don't order until you've carefully checked out the vendor. Make sure that the site lists a street address and a phone number. For customer feedback, visit RatingWonders.com and ResellerRatings.com. 4. Understand the Ratings Don't proceed blindly with a transaction just because the merchant displays those little chant's site doesn't answer your questions about the product, call for the details before you hand over your credit card. Ask about in-stock status, pricing breakdowns, and return policies.

If you order over the phone, you could run into high-pressure sales pitches. After making a number of calls to several sites advertising prices that looked almost too good to be true, we got the unpleasant feeling that some salespeople "engineered" the final tally. You may start out with a hot price on a popular item, but beware of pricey accessories and insurance charges.



## Everything Old Is New Again

CALL ME A SNOB, but when I buy something, I like it to be shiny and new. The term *refurbished* makes me ill at ease, conjuring up images of burned-out monitors and PCs with smoke wafting from the case. On the other hand, the cheapskate in me loves a bargain. And if you don't need the latest and greatest technology, refurbished equipment can save you anywhere

stars. Some ratings are mostly an indication that the site is designed for easy shopping. 5. Do It Online

Be wary of obscure sites that insist you call to seal the deal. This arrangement can be part of a bait-and-switch strategy, and you could end up on the telephone with an aggressive salesperson who'll try to foist expensive extras on you.

#### 6. Get the Real Cost

The best sites list the exact amount they will charge you before you finalize the purchase. Even if you must make a phone call, make sure the final tally adds up correctly. 7. Confirm the Warranty

Many sites are a bit fuzzy on warranty details, especially for refurbished items. So be sure to get the specifics and from 10 percent to 30 percent (sometimes more) off the price of the same item new. Certainly, there's some risk involved. *Refurbished* (as well as its aliases, *remanufactured*, *rebuilt*, and *reconditioned*) is a vague term. There's no way to find out whether your PC was returned in pristine condition from a convent or whether it doubled as a keg stand in a college dorm room. That said, most of our refurb purchases went smoothly enough, but we ran into a few complications along the way.

For starters, don't expect to be able to choose your components—you usually have to buy "as is." A second common drawback: The warranty may be substandard. Though some refurbs come backed by the same manufacturer's warranty that accompanies a new product, many carry far more-limited periods—like 90 days—if any. Resellers may try to sell you a thirdparty extended warranty, but proceed with caution. When you add the cost of the extended warranty to the price of the refurb, it might make more sense to buy new. Keep in mind too that returning refurbished items is often difficult or impossible; be sure to examine the merchant's policy before committing.

#### CHEAP BUT LIMITED

MANY MAJOR PC and electronics vendors, such as Dell, Gateway, and Egghead (www.egghead.com), sell refurbished items. And some merchant sites, such as Refurbdepot.com (www. refurbdepot.com), specialize in refurbs. You'll also find plenty of refurbs at auction sites like UBid (www.ubid.com). If you want a specific model, though, you may be out of luck.

Merchants don't always spell out online the full details of what you get when you purchase a refurbished item, especially with regard to warranty and return policies. If you expect something (such as a complete set of manuals) to be included, but the item's not listed, don't assume you'll get it. To confirm the specifics, pick up the phone. If a reseller refers you to the manufacturer for answers to warranty queries, make sure the manufacturer offers warranty coverage for refurbished items.

*PC World's* Aoife McEvoy went hunting for a refurbished Epson Perfection scanner. She bought a refurbished Perfection 610 (from last year's line) for the bargain-basement price

confirm them with the original manufacturer if possible. 8. Check Return Policies

Some products aren't returnable, and shipping and insurance fees are usually nonrefundable. Don't forget about the hefty restocking fees that some vendors charge.

#### 9. Get Shipping Details

It's always nice to know your new computer's whereabouts, even if the poor thing is sitting on a truck three states away. So look for a merchant site that maintains a shipment tracking system.

#### 10. Share Your Feedback

Help other consumers shop safely on the Web by sharing your experiences in online forums and on feedback sites like RatingWonders.com and ResellerRatings.com. of \$50 from 01dot.com (www.01dot.com). The scanner originally sold for \$200 new. The unit was advertised as offering a one-year manufacturer's warranty. McEvoy called Epson, and the company confirmed that the warranty was for a full year. When the scanner arrived, McEvoy reported that it looked like new, "but when I looked closely, there were tiny scrapes on the metal underneath the glass, and one of the lid hinges was a bit loose." Most important, though, the scanner worked perfectly.

#### WARRANTY WOES

WHILE AT LEAST ONE *PC World* editor got a straight answer about a refurb warranty, Harry McCracken had a very different experience. He went to UBid in search of a refurbished notebook and found a wide range of models available, but specs and warranty details were often sketchy. He settled on a listing for a used Compaq Presario 12XL326 offering a Compaq partsand-labor warranty of one year. He put in a minimum bid (\$636 plus shipping) and won the item. Brand new, this Presario had cost \$1400. "The notebook was in fairly good shape, but there were small blemishes on the case and some scratches on the screen," recalls McCracken.

The real glitch was the warranty. Inside the box, a Compaq warranty card clearly stated a coverage period of 90 days—not the full year promised on UBid's site. McCracken e-mailed UBid, which responded by saying it would hand over a refund if the original listing was incorrect. (UBid handles warranty queries only by e-mail.) Eventually, UBid wrote back with a message reaffirming that the warranty period was one year, and said to call Compaq. McCracken had to talk to four Compaq reps before getting a verdict, but it turned out that UBid's

BOTTOM LINE

#### THE MATH BEHIND A "DEAL"

ITEM	CompDirect.com price '	Lowest available price <sup>2</sup>	
Nikon Coolpix 990 (refurbished)	\$687	\$650	
Vidpro Power2000 Rapid Battery Charger <sup>3</sup>	\$99	\$92	
Olympus 64MB SmartMedia card *	\$129	\$65	
Apacer USB CF+ Type II Card Reader	\$99	\$99	
Sakar Digital/Video Carry Bag	\$59	\$14	
Digital Optics 0.45X wide-angle lens	\$149	\$90	
Raynox Super Telephoto lens	\$150	\$50	
Crystal Optics three-piece filter kit	\$149	\$130	
Subtotal	\$1521	\$1190	
Overnight shipping/handling	\$59	\$25 *	
Insurance (4.6 percent of overall cost)	\$70	not applicable	
Grand total	\$1650	\$1215	

Prices based on actual purchase of camera and accessories at CompDirect.com.
<sup>2</sup> Lowest prices for the identical camera and accessories tracked down through MySimon.

<sup>2</sup> Lowest prices for the identical camera and accessories tracked down through MySimo <sup>3</sup> Four rechargeable NiMH batteries included.

The Nikon Coolpix 990 does not work with SmartMedia cards.

<sup>1</sup> Includes insurance.

ad was correct. This made the notebook a good deal in the end.

All snobbery aside, refurbs can make sense, especially if you're on a budget. If you do your homework and find a reliable merchant, you can score some good stuff cheap. We did.



## Who Can You Really Trust?

ONCE YOUR SHOPPING bots have returned their lists of prices and merchants, and you've found an item you want, it's decision time. How do you know which sites to trust? Some of the merchants you recognize; most you probably don't. The lowest prices seem to be offered by the momandpop.coms. Other than by poring over feedback at sites like ResellerRatings.com, how can you find out whether a site is solid?

One common approach is to look for some type of merchant certification. In the brick-and-mortar world, the Better Business Bureau has conditioned most shoppers to buy with confidence when its logo is displayed in a store window or on a plaque. The BBB's online branch, BBBOnLine (www.bbbonline.com), awards a merchant its Reliability Program seal when the site meets specific requirements (see our chart on page 124). "When you want to verify the Reliability seal on a site, be sure to click through the logo to be brought to our confirmation report," advises Holly Cherico, a BBBOnLine spokesperson.

Similarly, certification icons from companies like Gomez (www.gomez.com) and BizRate (www.bizrate.com) tend to bolster shoppers' confidence online. But don't expect such ratings to insulate you from potential buying hazards. You might be surprised to learn how little protection lies behind some icons.

One of the most recognized ratings comes from Gomez, which awards merchants ratings of one to three stars. These ratings are usually attached to merchants' names on bot listings. Gomez does not charge merchants for these ratings. HUGHES

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#### SHOPPING REPORT CARD

#### THE MEANING BEHIND THE STAMPS OF APPROVAL

RATING AUTHORITY	Type of seal or rating	Meaning of seal or rating	Beyond the seal		
BBBOnLine www.bbbonline.org	BBBOnLine Reliability Program seal of approval	Merchant is member of the Better Business Bureau and has been in business for at least one year; its record of responding to customer complaints is satisfactory, according to the BBB's guidelines.	BBB doesn't endorse merchant or its products or services; BBB reviews information posted on the site but doesn't com- plete transactions. Violation of guidelines can remove seal.		
BizRate www.bizrate.com	Numeric rating from 1 (worst) to 10 (best); Gold Store star icon may also appear	Customers grade aspects of shopping experience, such as ease of ordering and on-time delivery. Gold Store icon indicates that mer- chant allows BizRate to survey its customers at point of sale.	Only customers' transactions that end in actual purchases are tabulated; we had a difficult time finding any merchant who had received a rating between 1 and 8.		
Gomez www.gamez.com	Star rating from one (worst) to three (best)	Gomez testers review checklist of essential features-including access to customer service, site security, and easy-to-find state- ments of store policies-without completing actual transactions.	Gomez monitors customers' complaints, and as a result it may pull a merchant's certification. One-star rating means the merchant failed to satisfy minimum requirements.		
CNet Shopper www.shopper.com	CNet Certified Store Program icon	Merchant gets certification when it meets various criteria, like easy access to site's policies and a secure environment. Merchant must provide CNet with its latest pricing info and must honor prices.	All certified stores are paying advertisers; CNet will reimburse customers for unauthorized charges, up to \$50, made by certified store. CNet places orders and tracks complaints.		

Intended to quantify what Gomez calls "site shoppability," the ratings take into account whether certain features—such as accessible customer service contact info and secure transactions—are available. Though Gomez says that it tests the sites firsthand, the ratings are based on taking transactions only as far as is possible without plunking down any cash. As a result, Gomez testers can't assess fulfillment or customer service problems. "We're not trying to say whether a site is good or bad from the standpoint of viability," says Gomez.com's director, Craig Nordgren. "Our ratings indicate whether a site has the features that our research suggests online shoppers want."

Overall, though, we found that most problems arose well after we placed orders. For example, I spent \$534 on a Nikon Coolpix 880 from ExpressCameras.com (www.expresscameras.com), which was awarded a one-star Gomez rating on a MySimon listing. At first I felt reassured by that star—but I shouldn't have. A single star means that Gomez appraised the vendor's site, but it failed to meet certification requirements.

#### WHEN GOOD DEALS GO BAD

MY COOLPIX 880 turned out to be a gray-market version, which Nikon confirmed was manufactured for the Japanese market. The software appeared to have been illegally copied onto a loose CD, and the camera shipped without a memory card or a USB cable. I returned the camera; a refund showed up on my credit card about three weeks later.

BizRate, which also serves as a shopping bot, gathers consumer feedback and rates each merchant in categories such as customer service and on-time delivery. The merchants included on BizRate's listings, like those rated by Gomez, do not pay to be there. The site rates vendors on a scale of 1 to 10, and I had to look hard to find any rating less than 8. One reason for the high scores might be that BizRate's surveys are fielded only upon completion of the checkout process, along with another survey after the delivery date. So shoppers whose bad experiences scare them away from ordering can't participate.

When you use CNet Shopper to search for a product, its result listings display "CNet Certified Store" logos beside the names of merchants that meet certain criteria. CNet says its logo ensures that merchants provide features such as up-todate pricing and secure transactions. The site carries out test orders periodically, and it monitors customer e-mail messages every day. Merchants pay referral fees to CNet when CNet visitors click through to the merchants' sites.

Full disclosure: PCWorld.com offers Product Finder, a shopping agent powered by PriceGrabber.com. Listed merchants pay PCWorld.com a referral fee. Until recently Product Finder included ratings from Gomez. At press time, however, Product Finder was switching to PriceGrabber.com's new customergenerated star ratings for merchants.

In general, ratings can steer you toward a merchant whose policies are appealing, at least on paper. But take the time to dig up the fine print and understand exactly what each rating means. If you stumble on a merchant site devoid of ratings or logos, it's not always a passport to trouble: The merchant simply may be new or may not have caught the attention of the rating sites yet. Always check consumer feedback. And remember that little thing called instinct? Use that, too.

Anne Kandra is a contributing editor for PC World.

#### NOW AT PCWORLD.COM

#### REFURBISHED MONITORS: WHAT'S THE DEAL?

*PC World* editor Grace Aquino went shopping for a refurbished monitor, but she didn't have an easy time finding exactly what she wanted. For a day-by-day account, check out "Diary of a Cheapskate Shopper" at find.pcworld.com/10724.

## More power than you can shake a stick at.

F

Things are different in the country.

) solutions



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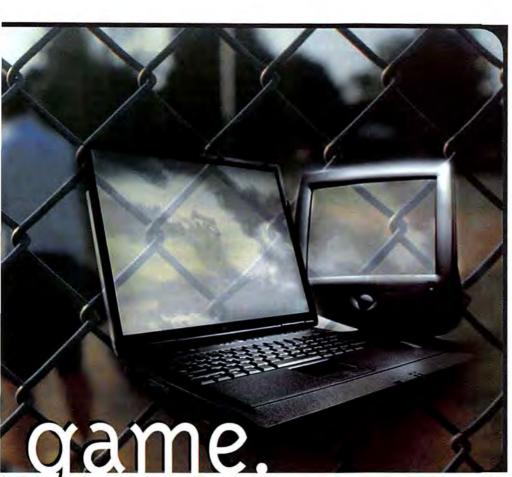
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- GCS300 Speakers
- 56K' Modem
- Microsoft<sup>®</sup> Works Suite 2001 Software<sup>1</sup>
- I-Year America Online® Internet Access<sup>3</sup>
- (new members only)
- I-Year Limited Warranty'

\$999



 Maximum data transfer rate dependent upon variables including particular modems with which you are communicating, telephone lines, communications software and communications protocols.

 Pocket Streets for Microsoft\* Windows\* CE requires Windows\* CE 2.0 or later, Hardware available separately. 3. TO AVOID BEING CHARGED A MONTHLY FEE, CANCEL BEFORE ONE-YEAR PERIOD ENDS. One-year period begins 30 days from receipt of system. You may incur surcharges even during promotional period for premium services, or long distance charges on your phone bill, depending on location and calling plan. Communication surcharges may also apply with some access numbers and in AK. For details and access numbers call 1-800-846-2000. Check with your local phone company to determine whether the access number you select is a local call for your calling plan. New U.S. members 18 and older only. Major credit card or checking account required. Uso may be limited, especially during peak usage.



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- GCS300 Speakers
- 56K' Modem

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- 3-Year Limited Warranty\*

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- 17" Color Monitor (15.9" Viewable)
- 32MB NVIDIA GeForce2"
- · 60GB Hard Drive
- · Recordable/Rewritable CD-ROM Drive
- · Sound Blaster Live!" Value Card
- · Boston Acoustics" BA735 Speakers
- 56K' Modem
- · Microsoft Works Suite 2001 Software"
- I-Year America Online Internet Access<sup>3</sup> (new members only)

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· 3-Year Limited Warranty\*

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- Integrated 24x max/Iox min CD-ROM Drive
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- I-Year Limited Warranty\*

#### \$999

#### Solo 5300CS

- 12.1" SVGA TFT Color Display
- Intel Pentium III Processor 700MHz
- 128 MB SDRAM (Expandable to 512MB)
- Modular 24x max/10x min CD-ROM Drive
- Modular 3.5" Diskette Drive
- IOGB Ultra ATA Hard Drive
- Internal V.90 56K' Modem
- Microsoft<sup>®</sup> Works Suite 2001 Software<sup>2</sup>
- I-Year America Online Internet Access<sup>3</sup> (new members only)
- I-Year Limited Warranty\*





shipping and handling and taxes. 5. On-line training: Instructor-led courses subject to availability, and students may be required to purchase course materials for certain courses. Customers need Internet access to use this service, and Gateway is not responsible for any connection charges. Prices exclude shipping and handling and tax. Gateway training is not offered as vocational or job training.

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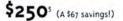
For the student on the go with a Gateway Solo<sup>®</sup> notebook PC! Includes a Kensington<sup>®</sup> Saddle Bag, Kensington Portable Starter Kit, Internet Training Subscription<sup>®</sup>, Deluxe Reference 2001 software bundle and mousepad.

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- · I-Year membership with Academic
- · I-Year membership with Knowledgenet
- MusicMatch Jukebox Plus
- · Epson Stylus® C4OUX Color Printer
- APC<sup>®</sup> Professional SurgeStation<sup>®</sup> Pro8Tz
- · Creative Video Blaster" Web Cam
- Internet Training Subscription<sup>6</sup>
- Getting Started Guide

\$299<sup>5</sup> (A \$548 savings!)



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 STEALTH

 Today's best antivirus

 programs are tough

 on PC parasites but

 easy on users.

FIGHERS



BY SEAN CAPTAIN ILLUSTRATIONS BY P.J. LOUGHRAN

IN MAY 2000, the LoveLetter (aka ILoveYou) computer virus became one of the most successful such viruses in history, infecting millions of PCs around the world through an e-mail message that claimed to be a love letter. The message's attachment was actually an updated version of the cleverly written Melissa virus that automatically sent itself to everyone in a recipient's address book, bringing misery to countless computer users and businesses as e-mail systems became clogged with LoveLetter copies.



At one time viruses crawled from PC to PC via the sneakernet of traded floppy disks, but today they race about the planet over e-mail and corporate networks, with the potential to spread to millions of machines in a matter of hours.

Fortunately, PC infections are preventable. A combination of common sense and an antivirus program can keep your PC healthy (see "What to Do About Viruses..." on page 132 for pointers).

Since our last roundup of antivirus programs (see find.pcworld.com/10640), significant developments have occurred in the antivirus world. All the programs we looked at have undergone major revisions and have new features designed to catch the latest viruses. We reviewed seven leading antivirus utilities for use on standalone home and small-office PCs, though F-Secure and Sophos are designed mainly for networked enterprises (and are priced accordingly).

To evaluate the efficacy of these applications, we asked virus expert Joe Wells, founder of the volunteer WildList Organization International (www.wildlist.org),

#### THE UNDISPUTED CHAMP

PANDA ANTIVIRUS Platinum 6.23 emerged Best the victor in our virus catching and killing tests. It caught every virus in both our known-virus and heuristics tests, and it posted no false positives. While it was not the fastest, its scan time was

still tolerably brief. Panda is also very easy to use, despite our minor annoyance with the registration process. At \$60 for the boxed product (\$30 for a download) Panda is a bit more expensive than some competitors, but this stellar performer is worth the price.

to test the ability of each to find viruses, destroy them, and repair the damage they cause. To provide a realistic test of the types of threats these programs will face, we exposed them to all the viruses on the March version of the WildList-a widely recognized roster of malicious programs. The list, updated monthly, identifies about 200 viruses that currently infect PCs. For more on our testing procedures, see "How We Tested" on the next page.

We also evaluated how easily a nonexpert could install and run the programs, configure them, set up scans, and update the list of virus signatures (the unique

parts of viruses an antivirus program uses to identify them). Finally, we examined what happens when a utility detects a virus and the solutions it offers.

#### KNOW YOUR ENEMY

AN ANTIVIRUS UTILITY searches for and tries to eradicate three types of malicious code: viruses, worms, and Trojan horses; of these, viruses are the best-known. Once a computer virus infects a file or a program, it can quickly spread from a single system to an entire network of PCs. And some viruses deliver a payload-a secondary program that can be harmless or

#### REVIEW

### ANTIVIRUS PROGRAMS: PANDA COMES OUT ON TOP

PROGRAM	Street price (5/27/01)	Viruses missed in signature test: Full scan/file access '	Unknown viruses missed	False positives	Scan time (min:sec)	Automatic updates and scans	Update duration, annual fee after first year	
F-Secure Anti-Virus for Workstations 5.21 ★★★☆ find.pcworld.com/10143	\$125	0/5	1	0	14:26	•	1 year, \$62.50	
Network Associates McAfee VirusScan 5.13	\$29	1/1	2	0	7:30	•	1 year, \$4.95	
Norman Virus Control 5 ★★★☆☆ find,pcworld.com/10146	\$60	0/0	6	0	23:30	0	1 year, \$45	
Best Panda Antivirus Platinum 6.23	\$60 °	0/0	0	0	5:06	•	1 year, \$30	T
Sophos Anti-Virus for Windows 95/98/Me ★★★ਵਿਵੀ: find.pcworld.com/10148	\$60 °	6/6	14	4	10:30	o	1 year, \$60 °	
Symantec Norton AntiVirus 2001 ★★★★☆ lind.pcworld.com/10145	\$40	1/1	3	0	3:47	•	1 year, \$3.95	
Trend Micro PC-cillin 2000 ★★★☆☆ find.peworld.com/i0149	\$40 ²	1/1	10	3	6:45	•	1 year, n/a *	

= Yes n/a = Not applicable

For details on *PC World's* Star Ratings, see <u>ind.pcworld.com/l0860</u>. For details on our testing methods and environment, see "How We Tested" on page 131. <sup>4</sup> Download-only version is available for \$30.

Per-user price; Sophos sells licenses for a minimum of ten users.



wreak havoc. Like a hit movie, a successful virus often leads to sequels and knockoffs—variations on the original.

Worms originally spread between machines by exploiting operating-system bugs, but today's worms copy themselves over e-mail. The BubbleBoy virus, for example, uses the scripting tools built into Microsoft Outlook. As soon as someone receives an infected e-mail message, the virus sends itself to everyone in that user's Outlook address book.

Trojan horses come disguised as other programs, but like the Greeks in their mythical wooden horse, these sneak programs can give their creators access to the host system. The well-known hacking tool BackOrifice, for example, is usually sent hidden within another program (such as a game) that the victim runs.

Antivirus utilities commonly catch viruses by scanning the files on your PC and comparing them to a library of virus signatures, each of which identifies a particular virus. Unfortunately, this means someone must first suffer an infection before the virus signature can be devel-



oped. For scanning to be effective, users must regularly update the utility's virus signature database, or the program won't have signatures for the newer viruses.

To trap viruses that the antivirus companies have not yet analyzed, antivirus utilities use a method called *heuristics*; that is, the programs scan not for a particular signature, but for certain types of behavior. This technique can lead to problems, however, when the utility mistakes an innocent file for a virus (a result known as a false positive). Other antivirus programs are common sources of false positives, too: If you install one such program on top of another, the new program may assume that the virus signatures of the original program are viruses.

Users can scan for viruses either on demand, by telling the program to search every file on a disc (or a selected directory) for viruses, or on access, by setting the program to look for malicious code automatically every time a file is opened or an app is installed. On-demand scanning is a good idea when you first install an antivirus utility to ensure that your PC is clean, or when you receive documents on a floppy or a CD-RW disc.

#### HOW THE PROGRAMS PERFORMED

Known viruses: We began our tests by downloading the latest virus signature updates on April 20, 2001, and running on-demand scans of a plague-ridden hard drive containing 225 viruses from the March 2001 WildList. Three products-F-Secure Anti-Virus, Norman Virus Control, and Panda Antivirus Platinumcaught every virus on the list. Two others-McAfee VirusScan and Trend Micro PC-cillin 2000-each let a single invader get by. Norton AntiVirus 2001 missed the file MSIE-A.EXE-a dangerous payload of the well-known IS/ Unicle.A-mm virus. PC-cillin missed a lesser-known variation of the LoveLetter virus called VBS/NewLove.A-mm, while Sophos missed six viruses.

We examined each scanner's on-access performance by copying the viruses to a new location on the hard drive. While F-Secure had a perfect score in our ondemand testing, it missed five viruses in its on-access scan, including two common viruses—Happy-99 and KakWorm.

**Speed:** We saw even greater performance variation in the time it took for each scanner to run on our Pentium III-550 test system. Norton was the speed

#### HOW WE TESTED

TESTING WAS performed by Joe Wells, founder of the WildList Organization International and head of AvTestlab.com.

All the antivirus programs' virus signatures files were downloaded April 20, 2001. We ran on-demand and on-access scans of 352 files infected with 225 viruses and six Trojan horses from the March 2001 WildList-a directory compiled by WildList Organization International of viruses observed to have infected two or more PCs of unwitting users.

All performance tests were conducted on identical 550-MHz Pentium III PCs with 128MB of SDRAM and 10GB hard drives, running Microsoft Windows 98 SE and Office 97 Professional. Each antivirus program was tested at its default settings.

Speed ratings for each product were calculated by averaging the times for three scans of 10,022 files-with the extensions .exe, .com, .bin, .dll, and .ovltotaling 894MB. We assessed each program's ability to repair virus damage by scanning and repairing 115 Word document files, 112 Word template files, 34 Excel spreadsheets, and a PowerPoint file infected with a variety of macro viruses. We counted a success as being able to open a document in the relevant application with its data intact.

Our unknown-virus testing used 63 samples of 33 viruses added to the April and May editions of the WildList, while the programs were using the virus signatures downloaded on April 20. All programs had their heuristics enabled at the highest level.



champ: Its average for three scans was just 3 minutes, 47 seconds. Norman trailed at a leisurely 23 minutes, 30 seconds. Speed isn't critical to virus scanning—it's accuracy that matters. The quicker a product is, however, the more likely you are to use it regularly. You could probably set a Norton on-demand scan to run during your coffee break. With Norman, you'd have to get lunch.

Unknown viruses: With new viruses spreading faster than rumors, you may not be lucky enough to download the signature for a new nasty before you catch it.

We tested the programs' effectiveness against unknown viruses by arming them

#### ACTION TIPS

### WHAT TO DO ABOUT VIRUSES...

#### ... BEFORE THE INFECTION

Install an antivirus utility that provides full-time on-access scanning and that is also relatively easy to update. Think before you click: When you click on an e-mail attachment, you are permitting

a program to do whatever it wants on your PC. Don't assume it is virus-free just because it appears to be from a friend. Apply security patches: Learn about the latest security glitches in our regular Bugs and Fixes column (www.pcworld.com/ heres\_how/bugfixes), and apply its recommended patches. ... AFTER THE INFECTION

McAfee VirusScan and Panda Anti-

Virus Platinum were the only products

that found the Homepage virus, which

was discovered in May and wouldn't have been included in any of the April 20

LOOK AND FEEL

On-access: There is very little difference

among the programs in the way they

behave during on-access scanning. They

all launch automatically at system start-

up, and they indicate their presence with

Four of the products-McAfee, Norton,

Panda, and PC-cillin-also caught virus-

an icon in the system tray.

signature files.

Scan and conquer: Pay close attention to what your scanner tells you and don't ignore warnings.

Pull the plug: If you get a virus, log off your network and run a full antivirus scan to keep the virus from spreading.

Get help-selectively: If you're at work, notify your system administrator, not the whole staff. At home, ask your antivirus vendor for more information.

with signature files from April 20, then running them on a hard drive with 63 variations of 33 viruses that were added to the April and May editions of the WildList stored on it. It is important to note that this technique did not test heuristics only: Our April 20 signature files may havealready contained signatures for the new viruses or other variants of the viruses that could be used to catch them.

Panda was the only utility to catch every new virus in this test; F-Secure missed just one. McAfee and Norton missed two and three viruses, respectively; Norman missed six; and PC-cillin missed ten. es that were attached to an e-mail message. For this trick, the utili-

ties create a *local proxy*—a program that scans an e-mail message before delivering it to the recipient's in-box. If the programs detected a virus, it could be deleted before it could infect the system. F-Secure, Norman, and Sophos don't scan incoming e-mail, but their on-access scans did catch the infected file.

1.14

**On-demand:** In contrast to automatic onaccess scanning, on-demand scans require that you take charge of the process. Panda Antivirus Platinum has a utilitarian but very navigable interface that makes it easy to use but still allows a high level of control in setting up scans. You can scan specific files or file types and schedule scans to run automatically.

Most of the products have coherent, navigable user interfaces. Norman's Virus Control is an exception: It's unduly confusing because it breaks the interface into a half-dozen components, making it difficult to find the controls you need. Norton and McAfee have some consistency problems. Their main control panels offer a translucent, Mac-style appearance, but other components retain a dull, boxy look seemingly left over from earlier versions. McAfee VirusScan's components are also poorly integrated. The system tray icon, for instance, has a pop-up menu that appears to let you change program settings, but those settings persist for only one session. So if you close and restart your e-mail client-to take just one example-you'll find that the e-mail scanner is disabled, even though you have instructed the program, via the icon, to keep the e-mail scanner always enabled. To make permanent setting changes,

you must launch a separate part of the program from the Start menu.

#### STAY CURRENT

AN ANTIVIRUS scanner will be most effective when it has the latest virus signature files. We recommend that you update your virus signatures weekly to make

sure your antivirus program can deal with all of the latest threats.

With that in mind, we paid special attention to ease of updating. Five programs—F-Secure Anti-Virus, Norman Virus Control, Norton AntiVirus 2001, Panda Antivirus Platinum, and Trend Micro PC-cillin—automate the process: Whenever you establish an Internet connection, each program checks its company's Web site for signature or product updates, then downloads and installs them. This feature is enabled by default for Norton and PCcillin, but the Norman and Panda utilities require you to turn it on. With F-Secure, you must install a separate automatic update program something that F-Secure's manual does not cover.

McAfee and Sophos have the least automated updating, requiring you to visit their Web sites or to initiate an update from within the program manually. However, McAfee does provide scheduled up-

date reminders, and all of the programs include a one-year subscription for their virus signature updates.

#### DON'T PANIC

FINDING A VIRUS, or a suspected virus, on your system can be unsettling. Fortunately, none of these utilities heightens the anxiety by alerting you with sirens, flashing lights, or images from teen slasher movies. But the alerts from PC-cillin

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	(freedom)	Da L. Benta	Canad   194s star pieces contact the

F-SECURE ANTI-VIRUS, when it finds a malicious program, provides plenty of background information on what that virus might do.

You may also see options to ignore the alert, delete the infected file, or place it in quarantine—a section of your hard drive where you cannot accidentally run or open the file. Quarantining a file also lets you isolate a new virus and send it to your antivirus vendor for analysis. Norton AntiVirus 2001 and PC-cillin can also automatically send the virus.

These antivirus products differ in how well they explain your options when a

#### Quarantining a file also lets you isolate a new virus and send it to your antivirus vendor for analysis.

and Sophos, though subtle in design, are likely to cause the most undue stress because they sometimes pop up when there is nothing wrong. In our testing, PC-cillin falsely identified three benign bits of code as malicious and Sophos logged four. None of the other programs here gave false positives in our testing.

If your scanner does detect a real virus, you will likely have several options for dealing with it. Like surgeons removing a tumor, antivirus utilities can repair a damaged file by snipping out the viral code and stitching the original file back together. All the programs successfully removed a range of viruses and repaired previously infected files of different types well enough that we could once again read the data in those files. virus is detected. McAfee, Norton, and PC-cillin all provide good information as to which virus has been detected and what they intend to do about it, but F-Secure wins our highest praise: Its dialog box alert includes a Virus Info button that links to a description of the suspect code. All the companies post on their Web sites extensive, detailed descriptions of every virus their programs scan for. Sophos takes the strong, silent approach by simply suggesting that you "refer to user manual for further details."

When it comes to printed documentation, though, Sophos takes top prize. The package includes a thoroughly illustrated installation guide; a detailed, spiral-bound user manual; and an informative, very readable book called *Computer Viruses*  Demystified. Like most of the other vendors, Sophos also includes PDF versions of its printed documents on the package's installation CD-ROM. Norton AntiVirus provides the best disc-based documentation, including four instructional videos.

#### GET IN AND OUT

WE DIDN'T RUN into much trouble installing any of the programs, although Symantec's Norton AntiVirus was the hardest utility to install—

it required a disruptive restart midway through the process and another restart to install the updates.

We experienced a slight glitch while installing Panda Antivirus—although the program has a built-in registration utility, Panda no longer supports it. Instead, the company wants you to register via its Web site. Our review copy didn't contain any information about the change, but Panda has since added a note to all packages informing users of the new procedure and providing step-by-step instructions. The Web-based registration, while less convenient, went smoothly. Although you can run the program without registering, registration lets you download virus signature updates.

Norton AntiVirus was difficult to remove from our test systems because its uninstaller leaves traces of the program on the hard drive. That can be a problem: Some antivirus programs will refuse to install if there is even the slightest trace of another one still on your PC.

Uninstalling Norton was a snap, however, compared with uninstalling Norman Virus Control—the version that we tested lacked an uninstaller and failed to appear in the list of applications under Windows' Add/Remove Programs applet. Norman subsequently provided us with an updated version that does uninstall via Add/Remove Programs.

Seán Captain is a PC World associate editor.

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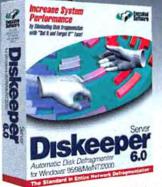
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JOSEPH DALESSIO helps defend Major League Soccer's corporate network from gamblers looking for inside information about games. .

WHO WAS TRYING TO BREAK INTO Major League Soccer's network? The question dogged Joseph Dalessio, network administrator for the New York-based league. "Either there were a lot of guys who wanted to try out for MLS teams, or they were gamblers looking for information that could affect the outcome of games," he says.

In January, Dalessio decided it was time to take stronger measures to protect the league's network. "We have a small user base—just over 500 people in 13 offices," he says. Even a single hacker-related outage could have been devastating, hitting everyone on the league's wide area network. So he deployed Cisco Secure PIX firewalls at league headquarters and at the 12 team offices.

Aside from rolling out the new, robust firewalls, Dalessio tweaked the network's infrastructure. For example, he took the old WatchGuard Technologies Firebox II (www.watchguard.com) system that had provided firewall protection for the league's previous network infrastructure and dedicated it to defending the remote-access servers that allow mobile workers to call in to the network. He broke monitoring and filtering functions away from the firewall and used SurfControl's SuperScout software (www.surfcontrol.com) to set up separate systems. And rather than add

## THE RIGHT WAYS TO PROTECT YOUR NET

Companies everywhere leave back doors open to hackers and thieves. Here are smart tips for tightening your security and protecting your enterprise.

BY BRAD GRIMES PHOTOGRAPH BY JOHN ABBOTT

virus protection at the firewall level, he decided to use McAfee's WebShield E50 appliances (www.mcafeeb2b.com) to scan incoming e-mail for the presence of viruses and other malicious code.

"We've had one-tenth of the intrusion problems that we had before," says Dalessio. "And when the Love Bug [virus] and its offspring hit, we were unscathed."

You can learn a lot from Major League Soccer, as well as from the other securityconscious companies we talked with during a month of interviews for this article. We spoke with network administrators who were struggling to keep up with hackers and malcontents. We also talked to security experts, who say that while no company can be totally secure, all could come a lot closer to 100 percent safety if they took additional precautions. security issues and how to defend yourself," says Lance Hayden, formerly of the CIA and currently manager of professional services in the Cisco Secure Consulting Services group. "Once you build a better mousetrap, hackers build better mice. But companies can do more to protect themselves. For example, passwords present a common problem. Make them too strong, and employees write them on sticky notes attached to their monitors. But [passwords] need to be stronger. When we do security audits, we can crack up to 70 percent of network passwords."

Better password protection is just one way to keep your network safe. Options for improving security range from perimeter firewalls and intrusion detection systems to virtual private networks and identity authentication products. But you can't just throw them all at your security

"It is becoming harder to keep track of

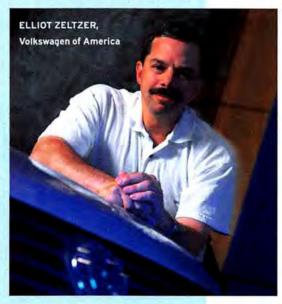
#### CASE IN POINT

## Volkswagen's Hard-Driving Firewalls

ELLIOT ZELTZER IS Volkswagen of America's manager of telecommunications and network services. Based in Auburn Hills, Michigan, he oversees a private extranet connecting 1000 dealerships across North America. When it came time to protect that network, Zeltzer faced the hardware versus software dilemma.

"In the end we wanted high performance and high reliability. In our opinion, that eliminated the option of a firewall running on a Windows NT or Unix server," says Zeltzer. Today, Volkswagen uses a pair of Cisco PIX 525 hardware firewalls to protect every connection along the company's network. "There are very few moving parts-no spinning disks and no operating system that can crash."

The hot-failover capabilities of the Cisco devices were also important to Zeltzer. If one firewall crashes, the second one automatically picks up the security duties, ensuring that the network is protected around the clock. "We didn't feel the clustering abilities of NT and Unix were quite ready for prime time," Zeltzer explains.



"We also wanted to push Unix out of our environment altogether, because it increased the cost of ownership," Zeltzer adds. "By streamlining our operations to as few platforms as possible, we've been able to drive down the cost of network operations by 15 percent." holes and sleep well. You need the right solutions for your company's unique situation. See which of the tips make sense for your company, and share your ideas with us at enterprise@pcworld.com.

#### DECISIONS, DECISIONS

Hard or Soft? Deciding between a hardware firewall and a software firewall is no trivial issue. In fact, the arguments in favor of each are so compelling that, of the two firewall solutions we hear about most from network administrators, one is hardware (Cisco Secure PIX) and the other is software (Check Point FireWall-1).

Hardware firewalls usually come in the form of plug-and-play appliances. Depending on the amount of traffic traversing your network, you may need a powerful model that can cost up to \$100,000. Firewall appliances are normally easy to scale: As you need more protection, you just plug in another one. They may also have failover capabilities—you can have dual firewalls protecting your network;

and if one fails, the other will pick up the slack.

Software firewalls run on your servers and often come in economical suites that may include a virtual private network or intrusion detection (see "Get Proactive" on page 141).

Examine your network to determine the level of protection you need. Firewall appliances won't work in every environment, but their performance and ability to handle large loads make them worth a look. Software can slow down network perfor-

mance if too much of it runs on one server (see "Break 'Em Up" on page 141).

**Remote Chance** If your company employs a legion of mobile workers who connect to the corporate network through a remote-access server, the chances aren't so remote that a snoop could use that

#### CASE IN POINT

## Marshall & Ilsley Bank Profits From Virus Protection

LAST FALL, the network administrators of Milwaukeebased Marshall & IIsley Bank decided that its more than 200 branch offices needed better protection against viruses. The heart and soul of the bank's business ran on secure mainframe systems, but 6000 workstations and several e-mail servers needed reevaluating.

"Enterprise-wide antivirus protection wasn't uniform," says Erin Fliess, M&I's LAN support manager. "Some branches ran Norton AntiVirus; others ran old versions of McAfee. There was insufficient protection on our e-mail servers, and there was no way to centrally manage what antivirus solutions did exist."

M&I chose to adopt McAfee's EPolicy Orchestrator (www. mcafeeb2b.com), a server product that can manage large networks of computers running various antivirus utilities. An EPO server at M&I's headquarters monitors virus protection at branches in Arizona, Florida, Minnesota, and Nevada.

"We especially like this solution because it runs well on the available bandwidth connections that we have between offices. We can broadcast virus updates to all our systems and have the changes in place within a day," says Fliess.



"As an added benefit, the product gives us an accurate count of workstations in the field," she says. Currently, the M&I network fends off half a dozen virus attacks each day.

server to break in. You may diligently secure your network perimeters with firewalls and other systems, but if you don't authenticate remote-access connections or protect the server, you're leaving the back door wide open.

Consider installing a software-based firewall for your remote-access server. VPN suites, such as VPN-1 software from Check Point (www.checkpoint.com), also include remote-access security features.

If mobile workers handle confidential documents, their home PCs and notebooks should also run firewall software. A couple of our favorites: Zone Labs' \$40 ZoneAlarm Pro (www.zonelabs.com) and Network Ice's \$40 BlackICE Defender (www.networkice.com).

**Get Proactive** Firewalls have become commonplace, but they're mostly reactive devices. That's why a growing number of companies are also deploying intrusion detection systems. If firewalls are the deadbolts, intrusion detection systems are the trip wires that set off alarms should someone get past the first line of defense. IDS products monitor and analyze net-

work traffic to flag or stop intrusions, including denial-of-service attacks.

Intrusion.com (www.intrusion.com) is just one company with a line of hardware and software IDS products. Check Point, Cisco, Computer Associates, Symantec, and others also have IDS products.

**Break 'Em Up** Consider setting up servers or purchasing appliances that focus on one aspect of security apiece, separating your firewall, VPN, intrusion detection, and encryption systems. The chief benefit? Speed—as security measures become a ubiquitous part of your enterprise, they're liable to drag down your network. Separate servers, each focused on one task, can process data relatively quickly. As traffic grows, you can add a second or third firewall (or other security) more easily.

The Keys to Security An increasing number of companies are turning to public-key infrastructure technology to encrypt and secure all the data traveling along their networks. PKI software allocates digital certificates to company employees, enabling them to authenticate, encrypt, and decrypt files. But PKI products from companies like VeriSign (www.verisign.com) and RSA Security (www.rsasecurity.com) don't come cheap. Research firm Gartner estimates that the typical cost of launching and managing PK1 software for 5000 to 25,000 users ranges from \$150 to \$180 per seat.

When you investigate PKI products, ask the vendors how they charge for their systems. Is it per seat? Per application you want to secure? A combination? You'll also have to factor in training and support costs when you deploy a PKI system. It can be a very complex project, but PKI offers some of the best network security.

**Solidify Your OS** Anyone who uses Microsoft Windows (pick a version) already knows that operating systems are not always secure.

Enter trusted operating systems: security-hardened versions of standard operating systems. In the past, these products were so pricey and difficult to maintain that only big enterprises in need of rockhard security bought them. But that was before the Internet made everyone a potential security casualty.

Trusted operating systems come in many flavors, including versions of Windows NT and 2000, Linux, Sun Solaris, IBM AIX, and HP-UX. They tighten security by isolating communications capabilities and other OS functions to keep them safe from hackers. You can also bolster your current operating systems by purchasing a product such as WatchGuard Technologies' \$1295 ServerLock (www. watchguard.com), which hardens Windows NT and 2000 servers.

Pull the Plug Even in this era of highbandwidth, always-on Internet connections, there may be older desktop systems on your network that have dial-up modems inside. And if employees use those modems to get online or to synchronize information with home computers, they are circumventing your network firewalls.

The likelihood that a hacker will break in to your network through a modem connection is slim, but you should still take all reasonable precautions against it. Unless employees need dial-up modems to do their job, don't buy systems with bundled modems. And consider removing the modems from existing systems.

Scan Those Retinas Biometrics may seem like something out of *Star Trek*, but you ought to start thinking about using fingerprints, retina scans, voice recognition, and other unique-identifier technologies to authenticate network users. All these technologies offer protection against unauthorized users whether company employees or folks meandering through the halls—who try to log on to a networked computer and then rifle through files.

Biometrics solutions may not be perfect (ask the vendors of fingerprint scanners how their products handle cellophanetape impressions), but they're better than easy-to-remember (and -guess) passwords like birth dates and maiden names.

DigitalPersona's (www.digitalpersona. com) popular U.are.U fingerprint security system is available in one version for corporate use and in another for home and small offices (the \$149 U.are.U Pro and \$99 U.are.U Deluxe, respectively). Other choices abound. Veritel's Voice-Check (www.veritelcorp.com), for example, uses voice recognition to authenticate users, while products from Viisage (www. viisage.com) use face recognition.

Vanquish Viruses Unless they have cute names like Melissa, viruses don't get much attention at the corporate level. But it's vital that you secure your enterprise against them. You can run antivirus software at all levels, from a gateway to a workstation, but you need central management to know what protection you have and whether it's working.

Symantec (www.symantec.com/product/ product\_vp.html) has an extensive line of enterprise antivirus products, including Norton AntiVirus for Gateways and Norton AntiVirus for Firewalls. Its Symantec System Center permits real-time communication with clients and servers from a single location. Competitors McAfee and Trend Micro also sell complete enterprise antivirus products.

Brad Grimes is a contributing editor for PC World.

#### CASE IN POINT

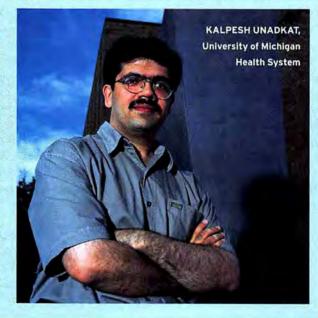
## University of Michigan's Healthy Approach to Security

IT'S LOOMING out there, an ominous cloud on network engineer Kalpesh Unadkat's horizon: HIPAA. Among other things, the Health Insurance Portability and Accountability Act requires healthcare organizations to ensure the security of medical records by April 2003. That includes encrypting all medical information that travels over networks.

As a result, the University of Michigan Health System must secure 10,000 desktop systems at three facilities-not to mention the PCs used by remote workers and telecommuters. The Health System is standardizing on Check Point Firewall-1 and VPN-1, and on Check Point's RealSecure intrusion detection system.

"We are running it on IBM's AIX [operating system], and we like the performance we're seeing," says Unadkat. "We also appreciate the fact that Check Point software is part of OPSEC [Open Platform for Security], so we can integrate new solutions fairly easily."

What about remote workers who download information to their home computers and laptops? Unadkat says that they are required to run Check Point VPN-1 software.





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## GET THE MESSAGE

### Instant messaging moves to plug the gap between phones and e-mail.

IN JUST THREE YEARS, tens of millions of people have been lured by the prospect of talking to friends and coworkers using instant-messaging software. AOL Instant Messenger, ICQ, MSN Messenger, and other services have changed the way people interact online.

That revolution is quickly moving inside corporate walls. Industry analysts say that millions of workers use IM-often without the knowledge of their IT departments. The Radicati Group, a consulting and market research firm, predicts that the number of active IM accounts used for business will jump from 28 million in 2000 to 687 million in 2004.

Already, more than 250,000 IBM employees use Big Blue's own Lotus Sametime software to send messages to each other over a network. The U.S. Army has 3100 people using WiredRed's E/pop. And companies such as Boeing and Dow Chemical use Microsoft NetMeeting for instant collaboration. Should your company consider IM too?

Software makers are quick to tout the advantages of enterprise IM. Users can see whether colleagues are available and make quick, efficient contact. For example, a marketing specialist who needs to set up a client briefing can type an instant message inviting a manager to attend.

But some experts believe instant messaging fills a space that may not need filling. "Does the value of the interruption equal or exceed the value [of the worker's task]? That's a question that isn't asked enough," says Gil Gordon, president of Gil Gordon Associates, a telecommuting and virtual-office consulting firm.

The problem, says Gordon, is that IM presents yet another distraction to workers already inundated by phones, e-mail, and beepers. While users can set IM software to ignore queries, the software still adds another channel of communication to an already busy environment.

IT departments must also assess how IM clients will affect system and network performance. Text-based messaging uses little bandwidth and processing power. But comprehensive IM clients often pack features such as a whiteboard, videoconferencing, and application sharingall of which can consume considerable PC resources and bandwidth.

Lou Latham, an analyst at industry research firm Gartner, contends that IM earns its keep. "As far as the individual worker is concerned, this is a major plus."

#### MANAGEMENT MUDDLE

LATHAM SAYS that most IT departments already contend with unmanaged IM installations because users download client software from the Internet. A key concern is the fact that IM clients such as

#### Consumer IM accounts (millions) Business IM accounts (millions) 113 28 185 62 282 151 423 345

### SMART TIPS

## Making IM Work

1. Choose software that works with your corporate directories. Look for clients that tap into your company's back-end directories (Novell Directory Services, Microsoft ActiveDirectory, or LDAP).

2. Train employees on IM etiquette, and make sure users understand that it's okay to tell others that they are too busy to receive messages.

3. Select customizable IM software that lets you hide features and limit access by account characteristics.

4. Unless your network is ready for bandwidth-hungry video, disable the audio and video features in IM clients. 5. Employ encryption to secure communications among employees. And be aware that external communications with vendors or customers will likely be sent "in the clear," where they could be intercepted by hackers.

those from AOL and Microsoft transact messages over their own servers. As a result, businesses may find sensitive information being transmitted unencrypted over the Internet and landing in the hands of unauthorized parties.

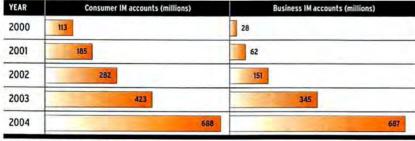
Furthermore, an IM system that fails to integrate with existing directory services or other databases could lead to a nightmare of double entries and mismatched settings. IBM says it opted to use Sametime for its massive IM rollout in part because that product taps into standard LDAP servers that store account data.

Ultimately, the question may be whether you can afford to avoid instant messaging. With its simple interface, small network footprint, and easy integration, IM promises sizable return for a small investment.

"We went from no users to over a quarter of a million users, with no help desk, no support structure, no anything-just word of mouth, says John Patrick, IBM's vice president of Internet technology. "It's become a way of life. If we turned it off, I think we'd have a mutiny."

-Michael Desmond

## PROJECTED IM GROWTH



Source: The Radicati Group

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## PRODUCTION-SAVVY LASERJET 9000

EVEN IN THE Internet age, large firms depend on high-volume transaction printing to produce invoices, checks, and purchase orders. These time-sensitive jobs often fall to dedicated production-class printers, which can be pricey and difficult to manage. Hewlett-Packard (www.hp. com) hopes to bridge the gap between departmental and production-level printers with its LaserJet 9000 series.

Built on a 50-page-per-minute engine, these new printers are rated for 300,000 cycles per month, double the capacity of the HP LaserJet 8150. They combine production-class specs with familiar technologies and management tools. The result is a printer that HP says can serve as both a departmental workhorse and an entry-level production printer. HP is hardly alone in this portion of the market: IBM, Xerox, and Konica all sell networked laser printers in the 40- to 60-ppm range. For production printing, Laser-Jet 9000 series printers translate data streams tailored for IBM and Xerox production printers into HP's PCL5 description language. This optional capability lets a firm deploy one of these printers without disrupting established practices. For departmental use, LaserJet 9000 printers feature the same management tools that are found in other HP printers, so they should integrate easily into existing workgroup operations.

In either environment, IT shops can cluster multiple LaserJet 9000 units to spread high-volume print jobs across several machines. In this scenario, virtual print speeds can approach 300 ppm.

The base-level HP LaserJet 9000, which lacks networking hardware and advanced paper options, is expected to cost \$2999 on the street, but most businesses will



HP'S NEW LaserJet 9000 printers can handle departmental and production chores.

want to start with the LaserJet 9000n at \$4839. The \$5369 9000dn variant adds duplex printing, while the \$8237 9000hns model significantly boosts media handling for high-volume operation.

-Michael Desmond

## SIGN ON THE DOTTED LINE

A LITTLE MORE than a year ago, then-President Clinton signed the Electronic Signatures in Global and National Commerce Act, validating electronic signatures as a legally binding way to sign documents.

Now, version 5.0 of Approvelt Desktop from Silanis (www.silanis.com) lets companies tap into the potential time and cost savings of electronic signatures.

Available for Windows 9x, NT 4.0, and 2000, Approvelt Desktop lets users electronically sign documents using publickey encryption to protect against tampering or intrusion. This capability lets businesses eliminate time-consuming



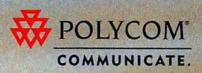
routing of paper documents without losing assurance that signed documents are valid under law. ApproveIt embeds digital signatures into documents, so they travel with e-mailed or downloaded files. Competitors include E-Lock Assured Office and ILumin Digital Handshake Server Suite.

Here's how it works: Users sign a document by clicking the Approve icon or by selecting Approve under the ApproveIt menu item that the software installs in popular applications. Once a signature is applied, ApproveIt Desktop takes a snapshot of the document and embeds an authentication code in the file. The next time a user opens the document, ApproveIt runs a second profile to confirm that the file still perfectly matches the signed original. If the program detects a change, it invalidates the signature.

Approvelt requires all signing parties to have the application installed—documents that are bound for other companies must be printed on paper for traditional signatures. To address this need, Silanis Approvelt Collaboration Server lets Approvelt users invite third parties into the signature process. Users send an e-mail with a link to the collaboration server, where invited parties enroll. The process requires installation of a software plug-in, however—a step that many IT departments may not authorize.

ApproveIt Desktop works with Word and Excel, Adobe Acrobat, and JetForm FormFlow 99 and FormFlow Classic software; a single-user license costs \$149. Volume discounts are available.

-Michael Desmond



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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.

## **Kingston**

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



Arriton M

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 familyowned 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 20,000plus items in the Windmill's convenience store and restaurant. "We desperately needed a solution that could bring all of these components of cur business together," he says.



Things finally turned around at the Windmill once Edelmann deployed PC America's Cash Register Express (CRE 2000), a Windows-based POS program that works with ordinary PCs and peripherals, as well as barcode scanners, receipt printers, and pole displays (which show charges at the checkout counter). Now all of the Windmill's cashiers can use touch screens and barcode scanners to enter orders and update inventory. And setting up CRE 2000 could not be easier, says Edelmann. "PC America did



The home page for PC America speeds you to the point-of-sale products you need.

an excellent job pulling all of the hardware together initially. But the great thing about their software is that I can grab any component I want off the shelf and throw it together in no time. This is one slick program."

The Windmill has processed more than half a million transactions with CRE 2000 and PC America's Restaurant Pro Express (RPE 2000) since October 1999. And Edelmann predicts that PC America will continue to develop the software he needs to keep things running smoothly. "PC America is constantly improving upon their products," he says.

Now PC America is helping retailers like the Windmill to move beyond the sale itself to increase revenues. A new feature in CRE 2000 gives businesses the ability to print coupons on the bottom of sales receipts on an Epson TM-T88II receipt printer. They can use the coupons to advertise specials on slow business days (e.g., "10 Percent Off All Purchases Every Tuesday"), or to give their customers discounts on overstock items (e.g., "Get a Free Six-Pack of Pepsi on Your Next Visit").

CRE 2000's couponing feature promises retailers an excellent route to a crucial dimension in retail sales. "Repeat business is the most important aspect of any business," says PC America's president, Howard Gosman. "With this addition to our POS package, we are giving our customers a quick and easy-to-use method for creating it."



### **Cash Register Express Software** for Windows...\$495

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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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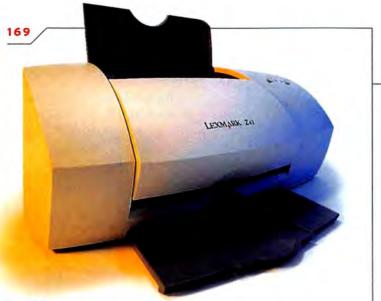
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Visioneer's new OneTouch 8820 scans quickly and produces crisp and colorful images for a reasonable price of \$200.

**177 MORE REVIEWS** 



EDITED BY LISA CEKAN

### Top 10 Printers Lexmark's new Z43 Color Jetprinter takes top honors.

## Gee, It's GeForce3

**Graphics boards with NVidia's** latest chip set, the GeForce3, show up throughout the Top 100 section this month. The Dell Dimension 8100 adds a Dell NVidia GeForce3 card and grabs second place on our *Top 15 Home PCs* chart. GeForce3 boards are showing up in business systems as well. Xi Computer's 1400 MTower SP—ranked third on our *Top 10 Power PCs* chart—includes a Leadtek WinFast GeForce3 card. The ELSA Gladiac 920, number three on the *Top 10 Graphics Boards* chart, also carries a GeForce3. For more on this chip set, see *Tech Trend* on page 158. Also, be sure to check out our extended review of monitors on page 96.

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, Matt Halloran, Robert James, Elliott Kirschling, Jeff Kuta, Danny W. Lam, and Thomas Luong of the PC World Test Center performed testing, with support from Julio Giannobile and Julian Weatherby.

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 Top 15 Home PCs

 With a GeForce3 graphics card inside, Dell's

 S279 Dimension 8100 holds second

 Participation of the power category.

 Top 10 Graphics Boards

 S20, featuring the

 GeForce3 chip set,

 Iands in third place

 In our chart.

#### Top 15 Notebook PCs

164

166

Compaq's Presario 1800-number six on this month's value chart-offers long battery life and extra audio controls that allow the laptop to work as a stand-alone CD player.

#### GUIDE TO STAR RATINGS

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What are the Star Ratings in the Top 100 charts? Starting with this issue, all products we test for the Top 100 section, and many of the products we test in other sections of the magazine, will get a star rating.

Every time a new product appears in our charts, 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 a another look at it, or unless we do a more extensive follow-up review. In subsequent issues, these ratings will have an accompanying date to indicate how long ago a product received its rating. Products that we tested before this 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 100

enter

## **TOP 10 POWER PCs**

	POWER SYSTEM	lssue tested	Overall rating	Street price (6/8/01)	PC WorldBench 2000 performance score 1	Comments
1	Best Dell OptiPlex GX400 find.pcworld.com/10360	July 01	84	Average: \$2245	Windows 2000 Good 203	Efficiently designed managed system ships with excellent display and DVD/CD-RW combo drive; price drops \$360 this month.
2	Best Gateway Professional S1700 EUV find.pcworld.com/10120	NEW	83	Expensive: \$2362	Windows 2000 Very good 224	Attractive, functional case design, offers tool-less upgrading; impressive Pentium 4 performance. ★★★☆
3	Xi Computer 1400 MTower SP find.pcworld.com/10126	NEW	83	Expensive: \$2949	Windows 2000 Outstanding 242	Sharp display, two 4IGB drives with IDE RAID card, and a high PC WorldBench score, with a price to match. $\star$
4	Micro Express MicroFlex 1333A find.pcworld.com/10363	July 01	82	Inexpensive: \$1599	Windows 2000 Outstanding 231	Excellent cost/performance ratio. Easy assembly thanks to color- coded rear ports and a setup poster; \$200 price reduction.
5	Sys Performance 1333TD find.pcworld.com/10123	NEW	82	Average: \$2124	Windows 2000 Outstanding 237	Impressive performance; graphics card supports two monitors at once; lots of room for expansion. ★★★?☆
6	Polywell Poly 880KR-1300 find.pcworld.com/10362	July 01	81	Expensive: \$2699	Windows 2000 Very good 224	Pricey but fast performer with an impressive array of compo- nents and multimedia extras; \$100 lopped off price.
7	MicronPC Millennia Max XP2 find.pcworld.com/10361	June 01	81	Expensive: \$2414	Windows 2000 Good 210	Attractive display, ample documentation, and still-speedy 1.2-GHz Athlon performance.
8	NuTrend Athlon Mega 2 find.pcworld.com/10366	Aug 01	81	Very inexpensive: \$1099	Windows Me Outstanding 178	Highest Windows Me score to date; ships with an IEEE 1394 card; price falls by \$200.
9	Dell Dimension 8100 find.pcworld.com/10364	Aug O1	79	Expensive: \$2366	Windows 2000 Good 198	Well-matched components, superb display and champagne- glass-shaped Harman/Kardon speakers. A tad slow for a P4-1700.
10	Sys Performance 1700 find.pcworld.com/10365	Aug 01	78	Average: \$2251	Windows 2000 Good 215	One of the fastest Intel systems we've tested; ships with a great display, but lacks an integrated system manual.
		Percent of overal	I rating ⊳	10 percent	25 percent	

See find.pcworld.com/10860 for details '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/1080) for more details.

AMD ATHLON PROCESSORS extend their lead over Intel's Pentium 4 competition with the debut of the 1.4-GHz Athlon CPU. Athlon-based systems often grab higher PC WorldBench 2000 scores than their PIII and P4 counterparts, and this month is no exception. The highest score on the chart is a blazing 242 from Xi Computer's 1400 MTower SP.

#### 1 Dell OptiPlex GX400

What's Hot: The 19-inch Dell P991 monitor accompanying the Opti-Plex GX400 delivered deep, rich colors and sharp text with only slight blurring at the maximum resolution of 1600 by 1200. The black, midsize tower case has 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 abound, with five open slots and four open drive bays. The OptiPlex GX400 sheds \$360 from its price to rest at \$2245 this month. 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, 256MB of RDRAM, and Windows 2000, the GX400 earned 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 doesn't match the performance of the best individual CD-RW and DVD units. Upshot: With speed, a beautiful monitor, and high-end management features, the OptiPlex GX400 will suit corporations that demand desktops with extra kick.

#### 2 Gateway Professional S1700

Best What's Hot: The guts of this new **EUY** Gateway include a 1.7-GHz Pen-NEW tium 4 processor and 256MB of PC800 RDRAM, which helped drive the system to a PC WorldBench 2000 score of 224-a scant 3 points shy of the fastest score we've recorded for an Intel-based machine running Windows 2000. Two USB ports reside on the front of the twotone gray midsize tower, and two others sit on the back of the machine. A single thumbscrew secures the sturdy metal side panel, which comes off easily after you remove the thumbscrew and slide two latches; snapping the panel back on takes some effort, however. Inside, nothing impedes access to the system's three open PCI slots. You can easily release the 60GB

2000		8 A	SE CONFIG	URATION		S. A. S. S. S. S. S.		D-1	Vendor's
CPU	RAM (MB)	Hard drive (GB)	Monitor size (diagonal inches)	Graphics board	Case type <sup>2</sup>	Open bays/slots	Extra features	Design and documentation	reliability/ service
Pentium 4-1400	256/ RDRAM	40	19	Dell GeForce2 GTS	Midsize tower	4/5	Very good: combination 8X DVD-ROM and 8X/4X/32X CD-RW drive, net- work adapter, Wake-on-LAN, Dell LegacySelect, OpenManage software	Good/ Average	Outstanding, Good
Pentium 4-1700	256/ RDRAM	60	19	ATI Radeon VE	Midsize tower	3/3	Good: 20X-48X CD-ROM drive, 12X/8X/32X CD-RW drive, network adapter, Microsoft Office XP Small Business Edition	Good/ Average	Good/ Fair
Athlon- 1400	256/ SDRAM	82 <sup>3</sup>	19	Leadtek WinFast GeForce3	Tower	6/3	Very good: 12X/8X/32X CD-RW drive, network adapter, Microsoft Office XP SBE	Good/ Good	*/Fair *
Athlon- 1333	256/ SDRAM	40	15 (LCD)	CardExpert GeForce2 Ultra	Midsize tower	3/3	Outstanding: 12X DVD-ROM drive, 8X/4X/32X CD-RW drive, V.90 modem, network adapter	Good/ Good	*/Fair *
Athlon- 1333	256/ SDRAM	61.5	19	Matrox Millennium G450	Midsize tower	4/4	Good: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, network adapter	Good/ Poor	*/Fair *
Athlon- 1333	256/ SDRAM	60 <sup>3</sup>	19	Leadtek WinFast GeForce2 Ultra	Midsize tower	5/1	Outstanding: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, V.90 modem, network adapter, Lotus SmartSuite Millennium Edition	Good/ Good	*/Fair *
Athlon- 1200	128/ SDRAM	40	19	Creative Labs GeForce2 Ultra	Midsize tower	3/3	Very good: 8X/4X/32X CD-RW drive, V.90 modem, Microsoft Office 2C00 SBE	Good/ Average	Good/ Good
Athlon- 1333	128/ SDRAM	40	19	Leadtek WinFast GeForce2 MX	Midsize tower	4/1	Very good: 16X DVD-ROM drive, V.90 modem, network adapter, Corel WordPerfect Office 2000	Good/ Outstanding	*/Fair *
Pentium 4-1700	128/ RDRAM	40	19	ATI Radeon	Midsize tower	2/4	Good: 22X-48X CD-ROM drive, 12X/8X/32X CD-RW drive, network adapter, Microsoft Office XP SBE	Average/ Average	Outstanding, Good
Pentium 4-1700	256/ RDRAM	40	19	Gigabyte GA- GF1280T-32	Midsize	4/4	Very good: 16X DVD-ROM drive, 12X/10X/32X CD-RW drive, network adapter	Good/ Poor	4/Fair 4
			10 percent	and the second			10 percent	15 percent	30 percent

#### Visit find.pcworld.com/11160 for reviews of all products mentioned in this chart.

<sup>2</sup> We define vertical cases as towers (taller than 20 inches), midsize towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches). <sup>3</sup> Total space on two hard drives.

Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs.

hard drive from its slots by pulling on green tabs. All of the drive bays in the system use this tool-less mechanism, as does the power supply. You can access the PCI slots without using tools by removing a thumbscrew and pulling back a bar. Graphics looked rich on the 19-inch Gateway EV910 monitor, and text looked crisp at most resolutions, blurring slightly only at the maximum resolution of 1600 by 1200. A helpful setup poster and wellmarked, color-coded rear ports make assembly a simple task. The system manual is a thick tome loaded with color illustrations and a massive troubleshooting section, but it's aimed at beginners.

What's Not: Gateway earned a rating of only Fair in our recent series of anonymous tech support calls, giving advice that was not always accurate.

What Else: The S1700 includes an ATI Radeon VE graphics board with a DVI port for connecting to most digital flatpanel monitors and with an S-Video output port for connecting to a television or VCR. The monitor's push-in wheel controller makes changing settings simple. The \$2362 price tag covers such useful extras as a 12X/8X/32X CD-RW drive and an ethernet card for broadband or network connectivity. The S1700 also ships with Microsoft Office XP Small Business Edition. Key response on the nearly silent Gateway keyboard felt a little sluggish. **Upshot:** Small or medium-size offices will like the well-rounded features of this powerful, easily upgradable Gateway.

## NEW ON THE CHART

### 3 Xi Computer 1400 MTower SP

What's Hot: Xi's 1400 MTower SP includes an AMD Athlon-1400 processor with 256MB of 266-MHz DDR SDRAM, and 82GB of storage space available on two hard drives connected to an IDE



GATEWAY'S POWERFUL and expandable Professional S1700 grabs a Best Buy.

RAID card. All this led the 1400 MTower SP to a PC WorldBench 2000 score of 242, the highest we've seen yet 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; its maximum resolution is 1600 by 1200. 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 permits speedy data backups. The system comes with the Small Business Edition of Microsoft Office XP (this version, sold only with new systems, includes Microsoft Publisher 2002). The manual lacks illustrations or system-specific information, but it contains lots of upgrading tips. Six fans (one on the CPU, one inside the power supply, two for the chassis, one on the graphics board, and one more on the motherboard) help keep the inner workings cool. Xi's lockable swing-out drive door has only one flaw: Its flimsy plastic hinges render the lock pointless.

**Upshot:** This AMD-powered Xi system delivers more punch than Xi's P4-based MTower SP, at a lower price. Video editors will appreciate the performance boost that the RAID-connected drives bestow.

#### 5 Sys Performance 1333TD

What's Hot: A 1.33-GHz Athlon system with 256MB of 266-MHz DDR SDRAM, the Sys zipped to a score of 237 on our PC WorldBench 2000 tests—one of the highest scores ever posted by a Windows 2000 system. The Matrox Millennium G450 DualHead graphics board lets you hook up two monitors at once to create one big desktop display. The 19-inch ViewSonic PF790 monitor delivered deep, rich colors and legible text even at its maximum resolution of 1600 by 1200. The 1333TD packs a 61.5GB hard drive, a 16X/10X/40X CD-RW drive for swift backups, and a slot-loading 16X DVD-ROM drive.

What's Not: Like other Sys systems, the Performance 1333TD ships with documentation for the third-party components but no overall system manual.

What Else: To get inside the beige midsize tower, merely loosen two thumbscrews and slide the sturdy side panel out on guide rails. The tidy interior has four open PCI slots and four open drive bays (two for removable-media drives, such as tape backup or hard-disk cartridge drives). The Microsoft Internet Keyboard has ten multimedia and Web hot-keys. A loopstyle case lock protects the interior.

**Upshot:** This Sys would please any smalloffice user looking for a PC that combines great performance with room to grow.



WITH ITS PRICE dropping to \$2245 this month, Dell's OptiPlex GX400 remains in the top spot.

### ALSO OF NOTE

WE TESTED a slew of systems with Pentium 4-1700 processors, including Xi Computer's 4170 MTower SP (the P4 brother of the new, third-ranked 1400 MTower SP) and Tangent's Medallion Pro Plus. Both systems include twin hard drives connected to an IDE RAID card. helpful for disk-intensive tasks like video editing. Acma's \$2598 ZPower P4 and Amax's \$2885 MicroPlex 8000 include Microsoft Office XP Professional in their software bundles. With PC WorldBench 2000 performance scores of 207 and 217, respectively, these systems didn't miss the chart for being slow; in both cases, the problem was their high cost.

#### TECH TREND

## GeForce3 Jumps Into Desktops

Graphics boards with NVidia's latest chip set, the GeForce3, have shown up on our *Top 10 Graphics Boards* chart (where ELSA's Gladiac 920 takes the third spot this month) and in some *Top 10 Power* 

PCs systems. These boards are costly, however; the ELSA goes for \$399. Will you see a return on your investment?

Two new Xi Computer systems, one powered by Intel's 1.7-GHz Pentium 4 chip and the other by AMD's 1.4-GHz Athlon chip, deal graphics through Leadtek's Win-Fast GeForce3 graphics card with 64MB of DDR memory. Though the Xis draw much of their speed from their CPUs, the graphics boards contribute to overall perfor-

mance. Both systems' scores were among the highest we've seen. The GeForce3 continues the graphics card's role of taking on many of the memory-intensive tasks previously relegated to the CPU. It handles memory bandwidth bottlenecks by performing many calculations entirely on the graphics board (and thereby avoids transferring data between the CPU and the graphics board).



But if you plan to use your new machine primarily for number crunching, word processing, and Web browsing, consider opt-

ing for a board that uses NVidia's budget GeForce2 MX chip. You won't notice any performance difference on these tasks, and the MX can shave nearly \$300 off the price of a system.

ELSA'S

Gladiac 920

## SleekLine<sup>™</sup> 1000 System



### SleekLine<sup>®</sup> 1000 Features

- · Compact, Stackable, and Transportable
- Intel<sup>®</sup> Pentium<sup>®</sup> III Processor *a* 1000MHz
- 128MB SDRAM @ 133MHz (up to 1GB)
- 20GB IBM Hard Drive (7200 RPM)
- 24X Low-Profile CD-ROM (DVD option)
- Sony 3.5" Floppy Drive
- Integrated High-Res. 3D AGP Graphics
- Integrated Enhanced Audio
- Integrated 10/100 Ethernet
- Integrated Hardware Diagnostics
- SleekLine" All-Steel, USA-Made Case
- Silencer<sup>®</sup> 150 1U Ultra-Quiet Power Supply
- Black Keyboard and Mouse
- Windows<sup>®</sup> ME or Windows 2000 Optional
- NEC 15.1" LCD Monitor Option (pictured)
- 3-Year Warranty and Expert Support

## Saves Space and Looks Great Too!

Just as the 1U rackmount revolutionized the server market, the SleekLine 1000 Mini 1U computer combines compact size, integrated features, uncompromised performance, and exceptional value, to make bulky PCs a thing of the past.

The versatile SleekLine 1000 sits unobtrusively under your monitor or, with its optional bracket, mounts inconspicuously to the bottom of your desktop (see photo). It can be used for sales presentations on the road, or unlike ordinary PCs, stacked in an array to save space.



75% smaller than standard PCs



With its 1GHz Pentium III, built-in fast Ethernet, high-resolution graphics, and low-profile case, the energy-saving SleekLine 1000 is the perfect Internet machine, office workstation, or home entertainment computer.



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## TOP 100

**TOP 10 VALUE PCs** 

	VALUE SYSTEM	lssue tested	Overall rating	Street price (6/8/01)	PC WorldBench 2000 performance score '	Comments
1	Best 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 manage- ability and security features.
2	Best ABS Conquest GL find.pcworld.com/10368	Apr 01	84	Inexpensive: \$1099	Windows Me Very good	Impressive display and simple assembly aided by color-coded ports and a setup poster; \$100 price cut.
3	Polywell Poly 830K7-1000 find.pcworld.com/10370	Aug 01	83	Inexpensive: \$1150	Windows Me Outstanding	Includes an easily removable hard drive (through the front of the tower) and partition-backup software.
4	Tangent Valera find.pcworld.com/10371	May 01	83	Inexpensive: \$1295	Windows 2000 Outstanding 216	High-caliber performance, but a mediocre monitor and cluttered interior; price falls by \$154.
5	MicronPC ClientPro CN find.pcworld.com/10369	0ct 00	81	Average: \$1303	Windows 98 SE Very good 158	Bundled manageability tools, adequate performance, and lots of room for expansion.
6	Gateway E-3400 XL Deluxe find.pcworld.com/10372	Mar 01	80	Average: \$1686	Windows 2000 Very good 190	Includes manageability software, chassis-intrusion detection, and still- impressive PIII-933 performance.
7	Gateway E-1600 XL Deluxe find.pcworld.com/10374	June 01	79	Inexpensive: \$1095	Windows 2000 Good 179	Nice compact case and tool-less drive removal, but graphics share memory and monitor is only average; \$75 off last month's price.
8	Acer Veriton 3200 find.pcworld.com/10375	Aug 01	78	Inexpensive: \$1260	Windows 2000 Very good 193	Powerful, managed system features chassis-intrusion detection and a twin- loop case lock.
9	Sys TaskMaster 850D find.pcworld.com/10373	May 01	78	Inexpensive: \$1150	Windows 2000 Good 175	Delivers powerful budget performance but offers few extras.
0	HP E-pc C10 find.pcworld.com/10122	NEW	π	Average: \$1518	Windows 2000 Very good 189	Tiny system delivers hefty corporate tools, including manageability software, a case lock, and a rear port-control system. ★★★###
		Percent of overal	all rating 🕨	20 percent	Z0 percent	

See find.pcworld.com/10860 for details 'A syst on PC World's Star Ratings. See "

'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.

HEWLETT-PACKARD'S E-PC C10 squeaks onto our *Top 10 Value PCs* chart this month at number ten. Its diminutive system box weighs just 8 pounds—about the same as some laptops—and it includes handy remote-management tools and extra security features. The E-pc C10 is not designed for expandability, however: It has no open slots or bays.

### 1 Dell OptiPlex GX150

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 wellarranged interior. You can remove cards, drives, the power supply, or the motherboard simply by flipping the appropriate green lever. No slowpoke, the GX150 earned a score of 190 on our PC World-Bench 2000 tests, 11 points above the average for similar 933-MHz Pentium III systems running Windows 2000. What's Not: The system's rear wall which supports the PCI slot cage—is a bit flimsy. Printed documentation consists of a monitor manual, an OS manual, and a system guide with only basic setup information. (You can find additional documentation on the included OptiPlex Resource CD-ROM or on Dell's Web site.) What EIse: The OptiPlex GX150 holds 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 text was clear and legible at 1024 by 768 pixels, though it blurred a bit at the maximum resolution of 1280 by 1024. The 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:** Priced at \$1401, this feature-rich system offers something for everyone in your company—from system administrators to cost accountants to end users.

### 2 ABS Conquest GL

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. Multimedia accessories include a strong three-speaker Cambridge SoundWorks Digital set and a 16X DVD-ROM drive. In

	1	25.05	B/	ASE CONFIG	URATION	1			Docion/	Vendor's
	CPU	RAM (MB)	Hard drive (GB)	Monitor size (diagonal inches)	Graphics	Case type <sup>2</sup>	Open bays/slots	Extra features o	Design/ documentation	reliability/ service
	Pentium III-933	128/ SDRAM	20	17	Dell NVidia 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	<sup>3</sup> /Fair <sup>3</sup>
	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	<sup>3</sup> /Fair <sup>3</sup>
8	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
	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
	Pentium III-933	128/ SDRAM	40	17	ATI Rage 128 Pro GL	desktop	0/3	Very good: 12X/BX/32X CD-RW drive, Iomega Zip 250 drive, network adapter, Wake-on-LAN, Intel LANDesk, Microsoft Office 2000 SBE	Average/ Average	Good/ Fair
	Pentium III-933	128/ SDRAM	20	17	integrated Intel 810	compact	1/2	Average: 20X-48X CD-ROM drive, network adapter, Norton AntiVirus 2001, Wake-on-LAN, Intel LANDesk, Microsoft Office XP SBE	Average/ Average	Good/ Fair
	Pentium III-1000	128/ SDRAM	20	17	integrated Intel 815E	compact	0/3	Average: 12X DVD-ROM drive, network adapter, PC-cillin 2000 Antivirus, Intel LANDesk Client Manager	Average/ Average	<sup>3</sup> /Fair <sup>3</sup>
	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	40	17	integrated Intel 815	compact	0/0	Average: 24X-40X CD-ROM drive, network adapter, Wake-on-LAN, HP E-DiagTools, TopTools	Limited/ Average	Good/ Fair
			1000	10 percer	it			10 percent	to percent	30 percent

Visit find.pcworld.com/11161 for reviews of all products mentioned in this chart.

<sup>6</sup> We define vertical cases as towers (taller than 20 inches), midsize towers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontal cases as desktops (5 inches or taller) or compacts (shorter than 5 inches).

Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs.

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 as only Fair in response to our anonymous service calls.

What Else: The \$1099 Conquest GL earned a score of 160 on PC WorldBench 2000-matching 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 multimedia and Internet access. Corel's WordPerfect Office 2000 and a thorough system manual come bundled. Colorcoded ports and a color instruction poster make setup a snap. Two open PCI slots and four open drive bays (three externally accessible) are available for expansion. with some wires cluttering the otherwise spacious interior. The system has both a modem and a network adapter.

**Upshot:** An impressive computer for a reasonable price, ABS's Conquest GL would make a solid small-office system for buyers on a tight budget.

### NEW ON THE CHART 10 HP E-pc C10

What's Hot: This blue, compact, \$1518 system was designed with the corporate buyer in mind—it takes up little space and weighs only 8 pounds, but its high-end features belie its size. Using HP's TopTools management software (the client version comes with this system), system administrators can perform remote diagnostics (with HP's E-Diag-Tools also installed), upgrade software, and detect unauthorized installations and driver updates—all from one location. A master passkey accompanies each shipment of E-pcs, so administrators can carry a single key to open all of them. A port-



DELL'S OPTIPLEX GX150 drops in price this month and keeps its spot as a Best Buy.

control system—a plastic shroud that covers the USB, parallel, and serial ports prevents unauthorized installation of any peripherals. Hewlett-Packard earned a rating of Good in our recent anonymous calls to its tech support lines, thanks to representatives who were eager to help. What's Not: Since the E-pc C10 has no open slots or drive bays, you can't ▶ upgrade the system beyond adding RAM or swapping out the hard drive. Only the hard drive, which can be removed without tools, is easily accessible.

What Else: Powered by a PIII-1000 processor supported with 256MB of SDRAM, the E-pc C10 earned a score of 189 on our PC WorldBench 2000 tests—about average for similarly configured Windows 2000 systems. The 17-inch HP 72 monitor adequately reproduced color; text blurred slightly at 1024 by 768 resolution and grew worse at the maximum resolution of 1280 by 1024. Color-coded rear ports and a setup sheet make assembly simple, and the basic system manual includes detailed troubleshooting information. This system comes with a laptopstyle 24X–40X CD-ROM drive (the tray is flimsier than that of a typical desktop-style drive, and you must press discs onto a spindle). Typing on the heavy standard HP keyboard is comfortable and remarkably quiet, although the keys feel somewhat sluggish.

**Upshot:** The E-pc C10 will fit into spaceconstrained corporate environments where security and manageability are more important than upgradability.

## ALSO OF NOTE

ALMOST ALL of the systems from August's *Top 10 Value PCs* chart return this month. Most of the desktops on the list have dropped in price, however, and the biggest reduction comes from the Tangent Valera, which shed \$154 and moves



HP'S E-PC C10 saves space on your desktop and includes management software.

up to the fourth spot. Dell's OptiPlex GX150 and ABS's Conquest GL hold on to the Best Buy positions; small price drops for each help them stay on top.

#### TECH TREND

## Waning Warranties and Truncated Tech Support

WHEN YOU BUY a new washing machine from a retail store, the salesperson will inevitably give you a spiel about buying an extended warranty-the first year's usually covered, but you have to pay extra for additional coverage. These one-year warranties-well established in the appliance industry-are fast becoming prevalent in the PC industry. Vendors have also tightened their policies on free tech support.

Instead of three-year warranties for parts and labor, several vendors appearing on our charts have cut their warranties back to one year of coverage, charging extra for longer periods. Dell reduced the parts and labor warranty and the tech support on its Dimension line from three years to one year and from lifetime to just one year, respectively. You can upgrade to two years of coverage for \$69, or get the original three/three/lifetime deal for \$119.

Dell argues that the change is good for customers. "It's more choice," says Dell spokesperson Bryant Hilton. "Some people don't want the three/three/lifetime [coverage]." In other words, they don't want to pay for the lengthy warranty. Hilton added that Dell passes along some cost savings in the form of reduced system prices.

"Certainly it's cost cutting," says Eric

Rocco, vice president of services research at analyst firm Gartner Dataquest. "But it's also about trying to find the balance between customer demand and whether or



not it's critical [to provide the coverage]. If the demand's not there, I doubt there will be too much of a backlash."

#### SUPPORT WHILE YOU SLEEP

IN ADDITION, many vendors say that their customers no longer demand around-theclock phone tech support. Tangent Computer reduced its support to 16 hours on weekdays and 11 hours on weekends. Those hours may accommodate most of Tangent's customers, but cutting back further may hurt customer satisfaction, warns Rocco. "You do have to offer tech support when people are home...until 10 or 11 p.m."

But some businesses do need 24-hour tech support, and customers in other countries may need U.S.-based support at any time. "The sun's always shining somewhere," says Rocco. These users will probably have to pay for longer support hours.

Some customers may balk when they see reduced tech support hours, but most small-business customers will probably accept them. "Sixteen hours will make 95 percent of your customers happy," says Rocco. "Is it worth staffing the other 8 hours to make 5 percent happy?" Most vendors don't think so.

NuTrend recently scaled back its support to 9 hours on weekdays only, and offers an upgrade to 24-hour, 7-day support for an extra \$29 per year. The company now outsources its tech support to a third party. "We were willing to spend the money," says NuTrend spokesperson Hip Lee, "But it's more difficult than we thought to...find people, train them, supervise them, and make them happy." Customers are even harder to find and make happy, and time will tell whether they will view a less expensive system as a satisfactory trade-off.

# FILEC Performance under extreme conditions

**Case Enclosures** 

Antec's reputation for performance has been earned on the front lines of today's toughest computing wars: Games, The Web, Data, Design. That's why for more than three years running, Antec enclosures have remained the Number ONE selling in North America. Now, Antec brings its reputation for superior design and quality to a full line of High Performance components and accessories including our new line of innovative "Jet Cool" CPU heatsink fans.



	POWER NOTEBOOK	Issue tested	Rating	Street price (6/8/01)	PC WorldBench 2000 performance score '	Comments
1	Best Dell Inspiron 8000 BUY find.pcworld.com/10440	July OI	89	Inexpensive: \$2295	Windows Me Good 141	Well-rounded desktop replacement for small to medium-size businesses sheds \$444 this month. The keyboard is noisy.
2	Gateway Solo 9500 find.pcworld.com/10441	July 01	88	Average: \$3098	Windows 2000 Outstanding 191	A heavy, powerful, multimedia-savvy desktop replacement with the largest screen available falls \$330 but gets a smaller hard drive.
3	WinBook Z1 find.pcworld.com/10442	Aug O1	86	Expensive: \$3239	Windows 2000 Outstanding 195	The fastest notebook we've tested drops \$300 and includes a large screen and plentiful storage for graphics pros on the go.
4	MicronPC TransPort GX+ find.pcworld.com/10448	NEW	85	Average: \$3039	Windows 2000 Very good	Classy notebook with a high-resolution, 1400-by-1050 screen provides easy access for upgrades. ★★★☆
5	Acer TravelMate 611TXCi find.pcworld.com/10459	NEW	82	Average: \$2599	Windows 2000 Average 158	Lightweight laptop packs a big screen, but speakers sound tinny.
E.	VALUE NOTEBOOK	Percent of overa	ll rating Þ	14 percent	20 percent	
1	Best Dell Inspiron 4000 EUY find.pcworld.com/10449	July 01	88	Average: \$1757	Windows Me Very good 142	Slim, attractive laptop lets you swap in colored palm rests and screen panel backs. \$454 price reduction adds to appeal.
2	Best 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 program- mable buttons. \$277 lopped from price this month.
4	Toshiba Satellite 2805-S202 find.pcworld.com/10452	May 01	81	Inexpensive: \$1499	Windows Me Good 135	Hefty, good-looking, gray-and-silver notebook doubles as a CD player with powerful sound. Price drops \$200 this month.
5	MicronPC TransPort GX+ find.pcworld.com/10453	Apr 01	80	Expensive: \$2549	Windows 2000 Good 154	Handsome notebook accepts affordably priced expansion compo- nents, but performance and battery life are unimpressive.
6	Compaq Presario 1800 find.pcworld.com/10446	NEW	80	Expensive: \$2399	Windows Me Outstanding 151	Black-and-silver notebook offers long battery life and doubles as a jukebox with outstanding CD-player controls. ★★★druk
7	Enpower ENP-325W2 find.pcworld.com/10454	Feb 01	80	Average: \$2199	Windows Me Very good 145	Utilitarian system simplifies access to components. Sound is weak, and overhanging screen panel makes the unit awkward to carry.
8	Micro Express NP4800D find.pcworld.com/I0455	Mar Ol	80	Inexpensive: \$1599	Windows 98 SE 139	Well-appointed for the price, this laptop permits easy upgrading. Doc- umentation is vague and sometimes misleading.
9	HP Omnibook 500 find.pcworld.com/10456	Mar Ol	80	Expensive: \$2444	Windows 2000 Average 149	Ultraportable becomes a featherweight after you remove base unit that provides two modular bays and most ports.
10	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.
		Percent of overa		17 percent	17 percent	

<sup>1</sup>Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" at find,pcworld.com/11080. For details on PC World's Star Ratings, see

NOTICE SOMETHING DIFFERENT about our notebook charts? The new design is only half the story. Beginning this month we classify notebooks by their configurations, not their prices. Power notebooks are highperformance systems with cutting-edge components; value notebooks have more-mainstream configurations. Many of the usual suspects from our old power chart remain on the new roster, while systems from the old midrange and budget notebook lineups generally land on the value list.

Dell models make a Best Buy sweep this month. Dell's hefty (9.2 pounds with AC adapter), Pentium III-900-based Inspiron 8000 stays atop the power chart. We were a little disappointed with its performance, but we liked the featuresincluding dual pointing devices and a 15inch screen-you get for a modest \$2295.

The slim Inspiron 4000 tops the value roster. Also a Pentium III-900 system, it

find.ocworld.com/10860

CPU	Screen	RAM	Hard drive	Pointing	Multi-	Extra features	Overall design	Battery life (hours:min) <sup>2</sup>	Average weight (pounds) <sup>3</sup>	Vendor's reliability/
CFU	(inches)	(MB)	(GB)	device	purpose bays			(10013.1111)	(pounds) <sup>3</sup>	service
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	15.7	256	20	touchpad	2	Good: 8X DVD-ROM drive, LS120 drive, built-in modem and network adapter	Very good	Good/ 3:05	Heavy/ 9.0	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 *
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- 850/700	14.1	128	20	touchpad	1	Very good: combination 8X DVD-ROM and 4X/4X/24X CD-RW drive, built-in modem and network adapter	Very good	Average/ 2:20	Light/ 6.6	Good/Good 4
ade o			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 net- work adapter, Microsoft Word 2000	Very good	Average/ 2:25	Average/ 7.4	Fair/Fair
Pentium III- 700/550	14.1	128	10	eraserhead	0	Average: 8X DVD-ROM drive, built-in modem and net- work adapter, Lotus SmartSuite	Average	Average/ 2:59	Heavy/ 8.5	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- 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- 850/700	15	128	10	touchpad, eraserhead	1	Average: 8X DVD-ROM drive, built-in modem	Very good	Good/ 3:24	Heavy/ 8.1	<sup>5</sup> /Good <sup>4</sup>
Pentium III- 800/650	14.1	128	20	touchpad	2	Average: 6X DVD-ROM drive, built-in modem, IEEE 1394 port, and TV-out port	Average	Average/ 2:27	Heavy/ 8.3	<sup>5</sup> /Fair <sup>4</sup>
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 net- work adapter	Average	Average/ 2:23	Average/ 7.1	Fair/Good 4
1. 19 M		Ny	5 percent			5 percent ·	10 percent	8 percent	8 percent	30 percent

<sup>2</sup> Unless otherwise noted, all notebooks come with a lithium ion battery. <sup>3</sup> Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.

\* Due to insufficient data from survey, score is based on responses to anonymous calls for tech support. \* Insufficient data to give a rating.

performs almost identically to the Inspiron 8000; but with a smaller screen and only one internal bay, it weighs and costs less. The business-oriented Dell Latitude C600 is our second value Best Buy.

Acer's lightweight, big-screen Travel-Mate 611TXCi and a speedier version of MicronPC's classy TransPort GX+ are newcomers to the power chart.

Turbocharged with a Pentium III-

1000/700 processor, Compaq's snazzylooking Presario 1800-new at number six on our value chart-has great speakers and handy audio controls to please music lovers. -Carla Thornton

#### FULL REVIEWS ONLINE

FOR DETAILED write-ups of all the new notebooks we tested this month, please use the Find-It URL at the top of the chart.

DELL'S INSPIRON 8000 is a solid desktop replacement for smaller businesses.

T	EST	ГО	P	15 H	HOME	PCs
	POWER SYSTEM	Issue tested	Rating	Street price (6/8/01)	PC WorldBench 2000 performance score !	Comments
1	Best MicronPC Millennia Max XP2 BUY find.pcworld.com/10360	Aug O1	91	Average: \$2267	Windows Me Outstanding 189	A \$332 price drop and a dazzling PC WorldBench score compensate for the mediocre 900Mx monitor (which has since been replaced).
2	Dell Dimension 8100 find.pcworld.com/10398	NEW	88	Average: \$2279	Windows Me Good 162	With a great new graphics card, this system was retested as new, but its processor performance is still somewhat slow. ★★★★:
3	HP Pavilion 9800 find.pcworld.com/10384	Aug O1	87	Inexpensive: \$2149	Windows Me Very good	Top-of-the-line Pavilion drops by \$350 and has an IEEE 1394 card. Characters on HP's monitor, however, lack sharpness at most settings.
4	Compaq Presario 7000Z find.pcworld.com/10383	July 01	85	Inexpensive: \$2196	Windows Me Very good	A first-class SOHO PC full of features for digital imaging enthusiasts, but Compag's reliability score and one-year warranty could be better.
5	HP Pavilion 7875 find.pcworld.com/10388	June 01	83	Very inexpensive: \$1898	Windows Me Good 166	Great performance on business applications and graphics; trade-offs include a cramped case and speakers that deliver weak, tinny sound.
	VALUE SYSTEM Per	rcent of overa	II rating Þ	10 percent	20 percent	
1	Best IBM NetVista A40i BUY find.pcworld.com/10387	Apr 01	85	Average: \$1637	Windows Me Very good 160	IBM's P76 monitor displays vivid color images. IBM lops \$211 from the price this month, but still limits free tech support to three years.
2	Best HP Pavilion 9820 BUY find.pcworld.com/10386	May 01	85	Average: \$1299	Windows Me 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.
3	ABS Multimedia System 2 find.pcworld.com/10394	Apr 01	83	Inexpensive: \$1129	Windows Me Very good	This PC has a 19-inch monitor that displays sharp text, but its 3D- game performance and DVD-movie playback were disappointing.
4	HP Pavilion 9820A find.pcworld.com/10500	Feb O1	82	Expensive: \$1689	Windows Me Very good 162	With loads of extra features and a roomy interior, this PC offers SOHO users plenty of options, but its gigantic case requires lots of space.
5	NuTrend Athlon Special 2 find.pcworld.com/10401	NEW	81	Inexpensive: \$999	Windows Me Outstanding 183	Though it has an older graphics board and no CD-RW drive, this basic system runs productivity applications well. ★★★☆☆
6	Polywell Poly KLX-850D find.pcworld.com/10396	June 01	79	Inexpensive: \$985	Windows Me Average 141	Despite its sharp images on DVD playback, Polywell's ViewSonic Optiquest monitor failed to translate warm tones accurately.
7	HP Pavilion BT858 find.pcworld.com/t0501	July 01	78	Average: \$1249	Windows Me 143	Includes two optical drives and an ethernet connection, but for gamers, the integrated graphics may detract from the bundle's value.
8	HP Pavilion 7800 find.pcworld.com/10397	July 01	77	Very inexpensive: \$899	Windows Me Good 147	Integrated graphics and sound offer pared-down performance that's more likely to please students than office users. Drops by \$100.
9	Dell Dimension L800CX find.pcworld.com/10395	July 01	77	Inexpensive: \$979	Windows Me Average 130	Comes with a CD-RW drive, but no AGP slot, a small hard drive, and a low PC WorldBench score limit its graphics and office potential.
-						

Percent of overall rating > 15 percent 15 percent

Windows Me

Inexpensive:

\$1175

For details on PC World's Star Ratings, see find.pcworld.com/10860. Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" at find.pcworld.com/1080.

Very good

THIS MONTH YOU'LL NOTICE a change in the organization of the *Top* 15 Home PCs chart. We've combined the former midrange and budget categories into a single "value" category that more accurately represents the types of PCs readers tell us they're interested in buying. Our power home PCs are loaded with the latest and greatest processors and peripherals. Our value chart ranks machines that aren't cutting edge but combine excellent performance and attractive prices, so you won't find any

77

Aug 01

PCs stripped bare of their essentials here.

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.

Despite these changes, you'll see many returning systems on the charts, along with a few newcomers. On the power side, the Dell Dimension 8100 shows off its new NVidia GeForce3 graphics card. Though some game effects looked flat or banded, the 8100's overall graphics performance was impressive. Also included are top-of-the-line optical drives and a net-

Polywell Poly K7-1000

.pcworld.com/

10

		B	ASE CO	NEIGU	RATION	iu.com/ro	540 for reviews of all products mentioned in this char			
	CPU	RAM (MB/type)	Hard drive (GB)	Monitor (inches)	Graphics	Case type <sup>2</sup>	Extra features <sup>3</sup>	Graphics quality	Setup and ease of use	Vendor's reliability/ service
	Athlon- 1333	256/DDR SDRAM	60	19	VisionTek GeForce2 Ultra	midsize tower	Very good: 16X DVD-ROM drive, 12X/10X/32X CD-RW drive, network adapter, Microsoft Office Small Business Ed., Norton AntiVirus 2001	Very good	Average	Good/ Good
1	Pentium 4-1700	128/ RDRAM	60	19	Dell NVidia GeForce3	midsize tower	Very good: 16X DVD-ROM drive, 16X/10X/40X CD-RW drive, no modem, network adapter, Microsoft Works 2001	Good	Outstanding	Outstanding/ Outstanding
	Athlon- 1333	256/DDR SDRAM	75	19	Asus AGP-V7700 GeForce2 GTS Pro	midsize tower	Very good: 16X DVD-ROM drive, 12X/8X/32X CD-RW drive, network adapter, Microsoft Works 2000	Very good	Average	Fair/ Fair
1	Athlon- 1200	256/DDR SDRAM	75	19	Creative Labs Annihilator 2 Ultra	midsize tower	Very good: 16X DVD-ROM drive, 12X/4X/32X CD-RW drive, network adapter, Microsoft Word 2000, Quicken TurboTax	Very good	Good	Poor/ Fair
	Athlon- 1300	128/DDR SDRAM	80	17	Asus AGP-V7100 GeForce2 MX	minitower	Very good: 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, network adapter, Microsoft Works 2001, Quicken Basic 2000	Very good	Average	Fair/ Fair
	1. 10	1000	1	10 percent			10 percent	15 percent	5 percent	30 percent
	Athlon- 1000	128/ Sdram	30	17	VisionTek GeForce2 GTS	minitower	Average: 8X/4X/32X CD-RW drive, NetObjects Fusion 5.0, Lotus SmartSuite 9.5, Microsoft Works 2000, Norton AntiVirus	Good	Outstanding	Good/ Fair
	Pentium III-1000	128/ Sdram	60	17	Asus AGP-V7700 GeForce2 GTS	tower	Very 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	midsize tower	Average: 16X DVD-ROM drive, Corel WordPerfect Office 2000	Good	Good	<sup>4</sup> /Fair <sup>5</sup>
	Athlon- 1200	128/ SDRAM	30	17	Asus AGP-V7700 GeForce2 GTS Pro	tower	Very good: 16X DVD-ROM drive, 8X/4X/32X CD-RW drive, network adapter, Microsoft Office SBE, McAfee VirusScan	Good	Average	Fair/ Fair
	Athlon- 1333	128/ SDRAM	30	17	MicroStar MS-8808 TNT2 M64	midsize tower	Average: 16X DVD-ROM drive, network adapter, Corel WordPerfect Office 2000	Limited	Average	<sup>4</sup> /Fair <sup>5</sup>
	Duron- 850	128/ SDRAM	30	17	Leadtek WinFast GeForce2 MX	midsize tower	Average: 12X DVD-ROM drive, network adapter	Good	Outstanding	*/Fair <sup>s</sup>
	Pentium III-1000	192/ SDRAM	60	17	integrated Intel 810	minitower	Good: I6X DVD-ROM drive, 8X/4X/32X CD-RW drive, network adapter, Microsoft Works 2001	Limited	Good	Fair/ Fair
	Pentium III-1000	128/ SDRAM	40	17	integrated Intel 810	midsize tower	Average: 12X DVD-ROM drive, Microsoft Works 2000	Limited	Good	Fair/ Fair
	Celeron- 800	128/ SDRAM	20	17	integrated Intel 810	minitower	Average: 8X/4X/32X CD-RW drive, Microsoft Works Suite 2001	Limited	Outstanding	Outstanding/ Outstanding
	Athlon- 1000	256/ SDRAM	30	17	MicroStar MS-8818 GeForce2 MX	midsize tower	Average: 16X DVD-ROM drive	Good	Average	*/Fair <sup>s</sup>
	in.	1	117 112	10 percent	and the second of the		10 percent	10 percent	10 percent	30 percent

<sup>2</sup> 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).

<sup>3</sup> Unless otherwise noted, all home PCs come with a V.90 modem.

\* Insufficient data to give a rating.

<sup>5</sup> Due to insufficient data from survey, score is based on responses to anonymous calls for tech support.

work adapter for broadband Internet access. The 8100 earns a rating of 4.5 stars.

IBM's NetVista A40i reigns over the value category. In this group, though, Hewlett-Packard's Pavilion series dominates the chart with four distinct models for digital enthusiasts and small-office users alike. NuTrend's Athlon Special 2, meanwhile, makes an impressive debut with its high PC WorldBench score of

183. Although it bested several power PCs in our WorldBench tests and has a phenomenally low price of \$999, the Athlon Special 2 comes with a limited set of software titles and no CD-RW drive.

#### FULL REVIEWS ONLINE

FOR DETAILED write-ups of all the new PCs we tested this month, please use the Find-It URL at the top of the chart.



**DESPITE NEW contenders and a reorganization** of our chart, Micron keeps its top power spot.

## To Own The <u>Ultimate</u> CD-RW, You Need Connections.



It takes connections to get things done. And the Backpack Triple Play is the only CD-RW that comes with **THREE** easy-to-use connections.

The pc-card connects to notebooks. The parallel port interface connects to your printer port. The USB interface even works with the new high-speed USB 2.0.



With these three plug and play connections you can write (up to 16X\*), play and rewrite cds on any desktop pc or notebook. Choose either the classic desktop or the portable bantam model.

Use our connections, and buy the <u>ultimate</u> CD-RW—the Backpack Triple Play CD-Rewriter.

\*several models available with varying speeds

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## **TOP 10 PRINTERS**



#### Visit find.pcworld.com/10600 for reviews of all products mentioned in this chart.

TWO NEW LEXMARK ink jet printers make their mark on the chart this month: The Lexmark Z43 and Z53 Color Jetprinters jump in at first place and fourth place, respectively. The two printers are quite similar, but both landed in the sweet spot for price and performance on our chart. We also tested the \$299 portable Canon BJC-85 and the \$79 Canon S400, but both failed to make the chart—the BJC-85 due to its relatively high price and the S400 because of lackluster print quality. Visit find.pcworld.com/10601 and find.pcworld.com/ 10602 to read reviews of both of these printers.

	INK JET PRINTER	Street price (6/5/01)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/ color graphics	Cost per page for monochrome/color (cents)	Comments
1	Best Lexmark Z43 BUY Color Jetprinter find Seworld.com/10561	\$100	92	4.5/0.5	Good/Good	5.1/18.9	FEATURES: Rated 12 ppm monochrome/6 ppm color. 2400- by-1200-dpi maximum resolution, 100 sheets input, 50 out- put. SUMMARY: Replacing the Z42, the Lexmark Z43 pro- duces fast, high-quality text and high-speed color graphics output. ★★★☆
2	Best Sharp AJ-2000 Find.pcworld.com/10563	\$129	90	4.6/0.9	Good/Good	4/13.7	FEATURES: Rated 6 ppm monochrome/3 ppm color. 1200-by- 1200-dpi maximum resolution, 150 sheets input, 50 output. SUMMARY: Best Buy delivers crisp, high-quality text but graphics are rather grainy. The AJ-2000 can also print to heavy card and banner paper.
3	HP DeskJet 932C find.pcworld.com/10562	\$149	89	4.1/0.7	Good/Good	3.6/11.1	FEATURES: Rated 4.5 ppm monochrome/2 ppm color. 2400- by-1200-dpi maximum resolution, 100 sheets input, 50 out- put. SUMMARY: The 932C is easy to set up and use, though it's a bit slower on text than the two Lexmarks. It produces sharp text and detailed (if somewhat light) color graphics.
4	Lexmark Z53 Color Jetprinter find.pcworld.com/10560	\$140	86	5.7/0.6	Good/Good	5.1/18.9	FEATURES: Rated 16 ppm monochrome/8 ppm color. 2400- by-1200-dpi maximum resolution, 100 sheets input, 50 out- put. SUMMARY: Like its 243 sibling, the new Z53 (which replaces Lexmark's Z52) produces high-quality prints at a slightly higher speed. ★★★☆
5	Epson Stylus Color 980 find.pcworld.com/I0564	\$249	84	6.6/2	Adequate/ Adequate	3.5/9.8	FEATURES: Rated 13 ppm monochrome/10.5 ppm color. 2880-by-720-dpi maximum resolution, 100 sheets input, 50 output. SUMMARY: This pricey unit is almost as fast as a monochrome laser. But its smudged, jagged text and filmy, dotted graphics fall short. Has a good software bundle.
6	HP DeskJet 952C find.pcworld.com/10565	\$199	83	3.9/0.7	Good/Good	3.6/11.1	FEATURES: Rated 5.1 ppm monochrome/3.6 ppm color. 2400-by-1200-dpi maximum resolution, 100 sheets input, 50 output. SUMMARY: With crisp but slightly grayish text and vivid color prints, the DeskJet 952C fits well in a small or home office. Printing speed is adequate but not great.
7	Epson Stylus Color 880 Tind.acworld.com/10566	\$129	83	4.5/1.2	Good/Good	3.3/11.6	FEATURES: Rated 12 ppm monochrome/9 ppm color. 2880- by-720-dpi maximum resolution, 100 sheets input, 30 output. SUMMARY: Quick performance but slightly chunky text and muddy color graphics on plain paper mark the Stylus Color 880. Print quality is much better on glossy paper.
8	Canon S600 find.pcworld.com/10567	\$199	82	3.9/0.3	Very good/ Good	2/13.6	FEATURES: Rated 15 ppm monochrome/10 ppm color. 2400- by-1200-dpi maximum resolution, 100 sheets input, 50 out- put. SUMMARY: Canon's photo-quality printer produces sharp text, albeit more slowly than other printers on the chart. Individual ink tanks help keep consumables costs low.
9	HP DeskJet 842C find.pcworld.com/10568	\$119	81	2.6/0.5	Good/Good	7.2/14.6	FEATURES: Rated 4.6 ppm monochrome/3.1 ppm color. 600- by-1200-dpi maximum resolution, 100 sheets input, 50 out- put. SUMMARY: The DeskJet 842C has a low price but slow performance. Output quality is mixed: dark, crisp text and smooth but foggy graphics. Documentation is outstanding.
10	Compag IJ1200 Find.pcworld.com/10620	\$129	78	4.5/0.5	Good/ Very good	5.2/19.1	FEATURES: Rated 10 ppm monochrome/5 ppm color. 2400- by-1200-dpi maximum resolution, 100 sheets input, 50 out- put. SUMMARY: Carrying the same print engine as the now- discontinued Lexmark 242, this printer produced smooth text and bright, sharp colors; but color printing is slow.

HOW WE TEST: The overall rating we assign to each ink jet printer is based on a combination of seven measures, which are given the following weightings: price (25 percent), print quality (20 percent), features (15 percent), ease of use (15 percent), speed (10 percent), service and support (10 percent), and cost of consumables (5 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See Ind.pcworld.com/10860 for details on PC World's Star Ratings.

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## TOP 10 GRAPHICS BOARDS

#### Visit find.pcworld.com/10780 for reviews of all products mentioned in this chart.

THIS MONTH, ELSA'S \$399 Gladiac 920 GeForce3 card posted the highest image-quality scores we've yet seen, earning it third place on our chart. With a GeForce2 Pro chip set and a reasonable \$169 price tag, the fourth-place MSI StarForce 831 is a worthy upgrade for people on a budget. In our lab tests, the StarForce 831 kept pace with the higher-end GeForce2 Ultra and GeForce3 cards on our chart at all but the highest resolutions. Meanwhile, options exist for people saddled with even tighter budgets: Three cards priced under \$100—including a Best Buy—are on this month's Top 10 chart.

	AGP BOARD	Street price (6/5/01)	Rating	Image quality	Overall speed	Features rating	Comments
1	Bost ATI All-in-Wonder Radeon BUY find.pcworld.com/10140	\$279	94	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 retains first place, thanks to its video features and bundled software. The All-in-Wonder is a great card for video-editing mavens.
2	Best Cardexpert GeForce2 MX BUY find.pcworld.com/10281	\$99	92	Good	Good	Good	FEATURES: 4X AGP, NVIdia GeForce2 MX chip, 32MB SDRAM, 350-MHz RAMDAC; S-Video-out, composite-out; DVD, over- clocking, and color-calibration software. SUMMARY: Priced at only \$99, this budget MX delivered respectable perfor- mance and includes a great software bundle.
3	ELSA Gladiac 920 find,pcworld.com/10280	\$399	91	Excellent	Very good	Good	FEATURES: 4X AGP, NYIDIA GEForce3 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; DVD software and game. SUM- MARY: Magnificent image quality earned the ELSA near-per- fect scores in that area. Full DirectX 8 hardware support will eventually be a plus for gamers. ★★★★
4	MSI StarForce 831 find.pcworld.com/10282	\$169	91	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 higher-end Ultra and GeForce3 cards in overall speed. ★★★★
5	Asus AGP-V7100 Deluxe Combo find.pcworld.com/10300	\$149	91	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, DVD, image editing, game, and color-cali- bration software. SUMMARY: Includes TwinView to display separate images simultaneously on TV and CRT screens.
6	Hercules 3D Prophet II MX find.pcworld.com/10283	\$99	90	Very good	Good	Good	FEATURES: 4X AGP, NVidia GeForce2 MX chip, 32MB of SDRAM, 350-MHz RAMDAC; color-calibration software, five game demos. SUMMARY: Lacks features and software bun- dles of the top cards, but this reasonably priced board's stel- lar image quality and performance help it stay on the chart.
7	ATI Radeon 64MB DDR Tind.pcworld.com/10284	\$229	89	Good	Very good	Very good	FEATURES: 4X AGP, ATI Radeon chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; hardware DVD support, S-Video-out, com- posite-in and -out; graphics editing software. SUMMARY: This card offers solid performance at high resolutions, a gen- erous helping of ports, and 64MB DDR SDRAM.
8	Hercules 3D Prophet II Ultra find.peworld.com/10301	\$409	87	Good	Excellent	Very good	FEATURES: 4X AGP, NVidia GeForce2 Ultra chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; DVI-out, S-Video-out, com- posite-out; DVD playback and color-calibration software. SUMMARY: A DVI-out port lets this card support some digi- tal monitors. Remains one of the fastest cards we've tested.
9	MSI StarForce 818 find.pcworld.com/10302	\$99	86	Good	Good	Satisfactory	FEATURES: 4X AGP, NVidia GeForce2 MX chip, 32MB of SDRAM, 350-MHz RAMDAC; S-Video-out; DVD, overclocking, desktop, and color-calibration software. SUMMARY: This inexpensive board's speed and image-quality scores nearly matched those of the other MX-based boards on the chart.
0	ELSA Gladiac Ultra find.pcworld.com/10303	\$299	85	Good	Excellent	Good	FEATURES: 4X AGP, NVidia GeForce2 Ultra chip, 64MB of DDR SDRAM; 350-MHz RAMDAC, S-Video-out; DVD software. SUMMARY: A S100 price drop makes this board much less expensive than the other Ultra on the chart. A small software and hardware bundle keeps it from placing higher.

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 Ouake 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 PCI33 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 <u>Find.pcworld.com/10860</u> for details on *PC World's* Star Ratings.

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## **TOP 10 SCANNERS**



#### Visit find.pcworld.com/10691 for reviews of all products mentioned in this chart.

IMPROVING ON the older Visioneer OneTouch 8800 by adding a transparency adapter, the new OneTouch 8820 lands in the number two SOHO spot on this month's chart. Among corporate scanners, the new HP Scanjet 7400c performed creditably, but not well enough to supplant any of the top three models here. The Office Edition of Microtek's X12USL scanner comes bundled with an automatic document feeder, but its slower performance kept it off the chart.

	CONO COLUMNS	Street	Overall	Scan	Scan speed (	sec per page)	- Andrews -
	SOHO SCANNER	price (6/14/01)	rating	quality	Black-and-white	Color '	Comments
1	Epson Perfection 1240U Photo EUY find.pc.world.com/10420	\$269	91	Good	20 @ 300 dpi	226 @ 1200 dpi	FEATURES: USB, 1200 by 2400 dpi, 10.6-by-17.1-by-3.7-inch case; <sup>2</sup> 6.2 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no automatic document feeder. SUMMARY: This hot successor to Epson's Perfection 1200U is fast and creates crisp, colorful images.
2	Visioneer OneTouch 8820 (NEW) find.pcworld.com/10421	\$200	91	Good	29 @ 300 dpi	263 @ 1200 dpi	FEATURES: USB, 1200 by 2400 dpi, 16.7-by-11.7-by-4.5-inch case, <sup>2</sup> 7.2 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter. SUMMARY: Zippy 42-bit-color unit has seven quick-start buttons. Live tech support (a toll call) is available only 9 hours weekdays. ★★★★
3	Microtek ScanMaker 4700 find.pcworld.com/10427	\$180	90	Good	29 @ 300 dpi	263 @ 1200 dpi	FEATURES: USB, 1200 by 2400 dpi, 11.4-by-20-by-4.6-inch case, <sup>2</sup> 8 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no optional ADF. SUMMARY: Has 42- bit color, high resolution, quick-start buttons, and lots of software; works with transparencies right out of the box.
4	Canon CanoScan N1220U find.pcworld.com/10428	\$199	89	Good	37 @ 300 dpi	298 @ 1200 dpi	FEATURES: USB, 1200 by 2400 dpi, 10.1-by-14.7-by-1.3-inch case, <sup>2</sup> 3.3 pounds, 8.5-by-11.7-inch scanning area; no optiona transparency adapter or ADF. SUMMARY: Ultrathin contact image-sensor unit produces good images and comes with a strong selection of software, including robust OCR.
5	Canon CanoScan D1230UF find.pcworld.com/10422	\$299	88	Good	35 @ 300 dpi	179 @ 1200 dpi	FEATURES: USB, 1200 by 2400 dpl, 11.3-by-18.1-by-4.3-inch case, <sup>2</sup> 8.7 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no optional ADF, SUMMARY: Impres- sive unit does color-accurate reflective and transparent scanning on the quick-but at a premium price.
6	Agfa SnapScan E50 find.pcworld.com/10429	\$179	87	Good	60 @ 300 dpi	416 @ 1200 dpi	FEATURES: USB, 1200 by 2400 dpi, 13.3-by-19.7-by-3.7-inct case, <sup>2</sup> 14.5 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no optional ADF. SUMARY: Offers high resolution and four quick-start buttons; delivers good- looking reflective and transparency scans.
7	Acer 1240UT find.pcworld.com/10425	\$149	87	Fair	48 @ 300 dpi	448 @ 1200 dpi	FEATURES: USB, 1200 by 1200 dpi, 12-by-18-by-4-inch case, <sup>4</sup> 9.5 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no optional ADF. SUMARY: Offers versatile software and around-the-clock tech support. But scan quality and speed are only average.
	CORPORATE SCANNER						
1	Best HP Scanjet 7450c BUY find.pcworld.com/10423	\$760 3	94	Good	17 @ 300 dpi	687 @ 2400 dpi	FEATURES: USB and SCSI, <sup>4</sup> 2400 by 2400 dpi, 12.3-by-22.6- by-7.3-inch case, <sup>4</sup> 13.8 pounds, 8.5-by-14-inch scanning area includes transparency adapter and ADF. SUMMARY: High- resolution S700 unit handles legal-size documents and transparencies. SCSI card and cable cost \$60 extra.
2	Microtek ScanMaker 8700 find,pcworld.com/t0430	\$1000 <sup>3</sup>	94	Excellent	29 @ 300 dpi	83 @ 1200 dpi	FEATURES: USB and IEEE 1394, <sup>3</sup> 1200 by 2400 dpi, 22.3-by- 15.3-by-6.3-inch case, <sup>4</sup> 25.5 pounds, 8.5-by-14-inch scan- ring area; includes built-in transparency adapter; ADF optional. SUMMARY: Great scan quality and performance. The \$400 ScanMaker 5700 is a more affordable alternative.
3	Epson Perfection 1640SU Office find.pcworld.com/10431	\$449	92	Good	17 @ 300 dpi	423 @ 1600 dpi	FEATURES: USB and SCSI, <sup>4</sup> 1600 by 3200 dpi, 11.4-by-17.4- by-9.2-inch case, <sup>1</sup> 14.8 pounds, 8.5-by-11-inch scanning area transparency adapter optional; includes ADF. SUMMARY: 42-bit color powerhouse is an all-around performer with sharp scan quality. A \$299 version omits the ADF.

HOW WE TEST: All scanners are tested at default settings under Windows 98 on a Gateway CP7-550 (Pentium III-550) PC with 128MB of RAM, using each scanner's bundled software. Overall rating is based on image quality (25 percent), speed (S0H0 22 percent; corporate 25 percent), ease of use (S0H0 17 percent; corporate 10 percent), features (S0H0 16 percent; corporate 25 percent), support (10 percent), and price (10 percent). Speeds are timed from start of scanning until cursor control is regained. Data based on tests designed by the PC World Test Center, Visit find, percent; corporate 10 percent), and price (10 percent). Speeds are timed from start of scanning until cursor control is regained. Data based on tests designed by the PC World Test Center, Visit find, percent; corporate 10 percent), and price with SCSI or IEEE 1394 adapter. \* Tested with SCSI interface. \* Tested with USB interface.



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## TOP 10 DIGITAL CAMERAS

#### Visit find.pcworld.com/10820 for reviews of all products mentioned in this chart.

WITH ITS SHARP IMAGES and competitive price, Toshiba's PDR-M61 leads a quartet of new under-\$500 digital cameras that earn places on this month's chart. Want to travel light? Consider Olympus's sleek, stylish Camedia Brio D-100; it slides easily into a shirt pocket. Looking for simplicity? Kodak's DX3500 is a true point-and-shoot that has few controls but produces great images for the price and offers an optional docking cradle for quick uploads. Rounding out the foursome is Canon's PowerShot A20, a solid, moderately priced zoom camera that's a bit harder to use than most.

	CAMERA: UNDER \$500	Street price (6/19/01)	Overall rating	lmage quality	Ease of use	Battery life/ shots	Comments
1	Best HP Photosmart 618 EUY find.pcworld.com/10580	\$399	78	Good	Good	Good/ 199	FEATURES: 2.1-megapixel resolution, 16MB CompactFlash media, 34mm-108mm focal range; 'USB, IRDA, and video out- put; 10.6 ounces. SUMMARY: This model has a low price for a camera with optical zoom and solid image quality. Features include audio memos and manual exposure controls.
2	Best Toshiba PDR-M61 (NEW) BUY find.pcwarld.com/10581	\$399	Π	Geod	Good	Excellent/ 312	FEATURES: 2.3-megapixel resolution, 8MB SmartMedia card, 38mm-114mm focal range; 'USB output; 14.3 ounces. SUMMARY: It's somewhat bulky and heavy, and there are no manual controls, but the PDR-M61 delivers sharp images and incredible battery life. ★★★☆
3	Olympus Camedia Brio D-100 (NEW) Tind.pcworld.com/10582	\$249	π	Gcod	Very good	Limited/ 29	FEATURES: 1.3-megapixel resolution, BMB SmartMedia card, 35mm focal length; <sup>1</sup> USB and video output; 7.1 ounces. SUM- MARY: A small, simple, and stylish point-and-shoot that's easy to use and very inexpensive, but has pathetic battery life. ★★★JCM
4	Kodak DX3500 find.pcworld.com/10583	\$299	76	Very good	Very good	Very good/ 219	FEATURES: 2.2-megapixel resolution, BMB internal media, 38mm focal length; 'USB and video output; 8.9 ounces. SUM- MARY: Superb images but few extra controls. A Compact- Flash slot supplements the internal memory; a handy dock- ing station is \$80 extra. ★★★
5	Olympus Camedia C-2040 Zoom Tind.pcworld.com/10584	\$499	76	Good	Good	Adequate/ 147	FEATURES: 2.11-megapixel resolution, 8MB SmartMedia card, 40mm-120mm focal range; <sup>1</sup> USB and video output; 13.7 ounces. SUMMARY: This camera's image quality nearly equals that of its \$999 sibling, the C-3040, but it has a lower maximum resolution and can't capture audio with videos.
6	Fujifilm FinePix 2400 Zoom find.pcworld.com/10585	\$399	76	Good	Adequate	Very good/ 259	FEATURES: 2.1-megapixel resolution, 8MB SmartMedia card, 39mm-114mm focal range; <sup>1</sup> USB output; 12.1 ounces. SUM- MARY: Camera combines optical zoom, compact point-and- shoot shape, and above-average image quality, but menu controls could be better. Support limited to 10 hours per day.
7	Canon PowerShot A20 find.pcworld.com/10586	\$399	73	Good	Adequate	Limited/ 66	FEATURES: 2.1-megapixel resolution, 8MB CompactFlash media, 35mm-105mm focal range; 'USB and video output; 12.6 ounces. SUMMARY: Solidly built camera produces middling-quality images. The controls are somewhat confus- ing and battery life is extremely short. ★★★????
8	Ricoh RDC-5300 find.pcworld.com/10587	\$499	72	Adequate	Good	Adequate/ 153	FEATURES: 2.3-megapixel resolution, 8MB SmartMedia card, 38mm-114mm focal range; 'serial, USB, and video out- put; 15 ounces. SUMMARY: This Ricoh is high-priced, given its somewhat limited features. But you do get a varied photo software bundle and easy-to-use control settings.
9	Sony MVC-FD87 find.pcworld.com/10588	\$499	71	Good	Good	Adequate/ 161	FEATURES: 1.3-megapixel resolution, 1.44MB floppy disk media, 39mm-117mm focal range; 'floppy output; 21.3 ounces. SUMMARY: A floppy-drive-equipped camera, it can store only six 1280-by-960 images on a single floppy disk. Records just enough pixels to produce pleasing snapshots.
10	Minolta Dimâge 2330 Zoom find.pcworld.com/10589	\$475	66	Good	Adequate	Good/ 203	FEATURES: 2.31-megapixel resolution, BMB CompactFlash media, 38mm-114mm focal range; 'USB and video output; 13.5 ounces. SUMMARY: This camera offers lots of pixels and long battery life. Test images are sharp but very dark; con- trols are cumbersome, and the LCD panel is a bit dim.

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 onscreen 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. '35mm film equivalent.



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Optional Hitachi U" .27DP 1280x1024 Color Monitor @\$165 Matrox G450 w/32MB 4X AGP Video Card w/Multi-Display Support of Combinations of 2 Monitors or Monitor and TV Onboard Sound & Stereo Speakers

ZOOM 56K V.90 Data /Fax /Moder PCI 10/100 Network Controller, Broad Band Ready Mitsumi 1.44MB Floppy Drive, High Speed I/O Ports: 25,1P, IG, 2USB Microsoft Internet Keyboard & Microsoft IntelliMouse Microsoft Windows 2000 Professional Free ABS<sup>TM</sup> High Quality Cloth-Surface Mouse Pad Free ABSTM PC Organizer (3" Color Binder w/Plastic Ziplack Packets for User Manual, Drivers & Application Soft

# **MORE REVIEWS**



MISSED AN ISSUE OF *PC* World or passed your copy along to a friend? Here's a recap of other Top 100 topics from previous issues. To read reviews of the products ranked on these Top 10 charts, go online and type in the *PC* World Find-It URL at the top of each chart (for example, find.pcworld.com/11000 for products on the *Top 10 Color Lasers* chart). Next month, the Top 100 will cover monochrome laser printers, 21-inch CRT monitors, and the latest digital cameras \$500 and over.



# = ; = EDITED BY DENNIS O'REILLY



# WINDOWS TIPS

#### SCOTT DUNN

# Search Me—and Every Other Version of Windows



IN THESE DAYS of gargantuan hard drives, it's easy to Versions lose files. Windows has its

own search feature, called Find (in Windows 9x) or Search (in Windows 2000 and Me), but few people take full advantage of it. Here are some ways to get the most out of your file and folder searches.

Start searching where you are: If you know that a file is somewhere in the folder you currently have open (or in one of its subfolders), don't start Windows' Find/

Search utility from the Start menu. Either you'll have to type the path of your starting point in the 'Look in' box, or the utility will waste a lot of time looking through disks or folders that you know the file isn't in. It's faster to press <F3> in any folder or Explorer window (hitting <Ctrl>-E in Windows 2000 or <Ctrl>-F in Windows Me will achieve the same result). This step will open the Find All Files window in Windows 9x or the Search Explorer Bar (the pane on the left with the search set-

tings) in Windows 2000 and Me. Specify the search parameters you want, such as 'Include subfolders' (in 9x) or Advanced Options-Search Subfolders (in Me and 2000), and click Find or Search Now.

Get a bigger view of results: When you search in Windows 2000 or Me, you can get more room to see your search results by pressing <F3>, <Ctrl>-E, or <Ctrl>-F to toggle the Search Explorer Bar on and off. Preview and navigate: The Search Results window in Windows 2000 and Me adds a few other features not found in previous versions of Windows. If you're searching for image files (such as .bmp, .jpg, or .gif files), you can select an item in the search results list to see a thumbnail of it at the top of the window. (In Windows 2000, you can also preview many sound and movie formats.) To open the folder of any file listed in the results, select the file and click its path name in the area at the top of the window (see FIGURE 1).

You can accomplish the same thing by right-clicking a file in the Search Results window and choosing Open Containing Folder, or by selecting the file and pressing <Alt>-FI. If you select more than one file, you'll also see the total space the files occupy-handy information if you need to copy the results to a disk that has limited space. In Windows 9x, you have to right-click the group and select Properties or press <Alt>-<Enter> to see this data in the files' Properties sheet.

Use your search options: If you're overwhelmed with results, you can refine your search. Specify a range of dates within which the file was created, or list a filesize range. In Windows 9x, choose the Find window's Date or Advanced tab to see more search options. In Windows 2000 or Me. click the Search Explorer

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Your lost files won't stay lost for long with our file-search tips; plus a great icon-extracting shareware utility.

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Upgrade Guide becomes Step-by-Step and debuts this month with a feature on building your dream machine (see page 88). The column will return to its regular home in the Here's How section next month.

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FIGURE 1: GET THE MOST from your search window by clicking Search Options to see ways to hone a search.

Bar's Date, Type, Size, or Advanced Options check boxes to set your options.

Don't forget wild cards: If you don't know DOS, you're not missing much, but DOS command-line syntax can be useful when using Windows' Find utility. An asterisk (\*) serves as a wild card for one or more characters in the name of a file or folder you're looking for, and a question mark (?) replaces any single character (see FIGURE 2).

For example, if you want to find all files that start with the letters *dis*, tell Find/ Search to look for **dis\***. You can use the asterisk and/or question mark first, or even multiple times, as in **\*win\*1\*** to find all files with *win* followed by 1 anywhere in their names. To find files of a particular type, use the asterisk followed by a period and then the file type's extension, as in **\*.mp3**. And to find all files with either a .tif or a .gif extension, just type **\*.?if**.

Find a better Find-FindX: Microsoft's free FindX utility allows you to customize your Start-Find or Start-Search menu with additional shortcuts. In the March 2000 Windows Tips (find.pcworld.com/ 10720) I wrote that FindX does not work with Windows 2000, but in fact it does—though you may need to log on as the administrator to install it, and then log off and back on again to use it. FindX is part of Microsoft's PowerToys utility, which is available from the Downloads library at PCWorld.com.

#### FIND FILES FAST WITH INDEXING SERVICE

Windows 2000 THE SEARCH feature will save you time when locating documents, but if the file

you need is lost in the ocean of data on your hard disk or network, even this tool can make you drum your fingers with impatience as Windows churns through billions and billions of bits and bytes. To the rescue comes Windows 2000's Indexing Service, a little-known feature that can find many types of files in a trice.

Index we trust: Indexing Service employs special filters to analyze files and create

indexes that it consults whenever you do a file search. Out of the box, Windows 2000 is able to index Microsoft Office documents, HTML and text files, and Internet mail and news documents. You can also install third-party filters for other file types. For example, Adobe Systems makes a filter for indexing Acrobat PDF files (to get this filter, go to find. pcworld.com/10723).

Search Results Ele Edit View Favorites " ER e- Dark + + + El Search Address ) Search Resul . 2Go Search C New @ 9.] Search for Files and Folders . Res or folders named "win\*1.7# Containing test Dives (C:) 10 Search Now ct(s)

FIGURE 2: WILD CARDS '\*' and '?' make files easier to find.

Start your engine: At the simplest level, you can use Indexing Service's built-in catalogs (collections of indexes and settings for specified folders) to scan the contents of the files on most of your local hard drives. Log on as the administrator, and choose Start-Search-For Files or Folders. If the underlined Search Options link is followed by '>>', click that link to open the search-parameters box. At the bottom of the box, click Indexing Service. In the Index Service Settings dialog box, check Yes, enable Indexing Service and run when my computer is idle, and click OK.

Get ready to tweak: For the greatest benefits, tweak Indexing Service and its catalogs to make certain that it indexes only the documents you want and doesn't waste memory and processor cycles on directories you never search. Launch the Computer Management utility: Choose Start-Programs-Administrative Tools-Computer Management. In the tree pane on the left, double-click Services and Applications, and then double-click Indexing Service. Many catalog-related tasks require that you stop and restart Indexing Service.

> With Indexing Service selected in the tree pane, choose Action-Stop, or right-click Indexing Service and choose Stop. Use this technique to stop indexing every time you run your backup software or perform a virus scan, because these programs can lock files and cause Indexing Service to abandon its update.

> Catalog it: To create your own catalog, either rightclick Indexing Service >

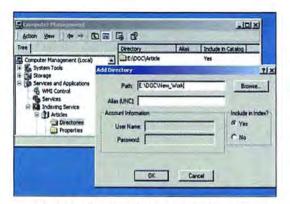


FIGURE 3: SAVE MEMORY and speed up your searches by cataloging only the folders you search most often.

or right-click in the right pane and choose *New-Catalog*. In the Add Catalog dialog box, type a name for your catalog. In the next box, you can type the path to the folder in which you want to store the catalog, or you can click *Browse* to locate and select the target folder.

Two notes on security: A drive formatted with NTFS will prevent users from seeing documents listed in search results unless they have permission. (In case you're wondering, Indexing Service never indexes encrypted files.) And don't store your catalog on a Web site because a catalog stored in a virtual directory or Web root may be locked by Windows 2000's Internet Information Service, causing Indexing Service to hog your processor as it tries in vain to update the catalog.

**Designated directories:** The more files Windows indexes, the more memory Indexing Service requires. Microsoft recommends 64MB of RAM for indexing up to 100,000 files, and 256MB or more to index around 500,000 files. To save

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	Indexing	5	10 <sup>-1</sup>	
DK	-	Lowlaad		High land
	Quinting	15	1.	1
	Indexing	15		

FIGURE 4: CUSTOMIZE INDEXING to get useful catalogs without wasting resources.

resources, limit Indexing Service to scanning only the documents you typically search. Double-click your new catalog in the right pane of the Computer Management window, then double-click the *Directories* folder inside the catalog. Rightclick an empty area inside the pane and choose *New-Directory*. In the Add Directory dialog box, type the path to the folder whose files you want to index (see **FIGURE 3**), or use the *Browse* button to find and select the

target folder. You can also enter network paths and specify any required user name and password information in this dialog box. Select Yes under 'Include in Index?'. When you're done, click OK.

**Be exclusive:** To exclude subfolders from a folder's index, repeat the steps above to specify the folder to exclude from the index, but select *No* under 'Include in Index?'.

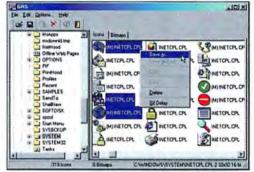
Rather than simply fine-tuning your own catalog, why not customize the default System catalog so it doesn't waste time indexing folders you never search? In Computer Management's tree pane, select the

System catalog under Indexing Service, and double-click the *Directories* icon in the right pane. Now you simply double-click the directory icons of folders you don't want indexed, select *No* under 'Include in Index?', and click *OK*.

Fine-tune performance: For even faster indexing, right-click Indexing Service in Computer Management's tree pane and choose Properties. Uncheck Index files with unknown extensions to limit indexing to files whose three-letter extensions match Windows' known filters (for example, .txt, .doc, and .htm). Click OK. You can also right-click Indexing Service and choose All Tasks. Tune Performance. Select a usage level (Used Often for frequent updates, and so on). Or click Customize, set the Indexing slider to the desired levels for Windows index updates, and set the Query slider to indicate how frequently you make searches (see FIGURE 4). Drag the slider to the left to use the least system WINDOWS TOOLBOX

#### GRS-I Know Icon, I Know Icon

WHETHER YOU'RE building a Web page, enhancing your quarterly report, or just retouching your virtual desktop, icons are a useful category of artwork. But getting existing icons in a file format you can work with isn't always easy. One solution is P&S Group's GRaphic Stealer Pro (or GRS for short), a \$15 shareware utility that lets you view and extract icons from .ico, .dll, .exe, and many other file formats. You can then save the icons in the .ico or .bmp format, or copy them to the Clipboard. Better still, you can select multiple icons and save them in a format



that accepts many icons, such as .icl or .dll. GRS is well worth the modest price. You can download the program from PCWorld.com's Downloads or from the P&S Group at www.psgsoft.com.

resources, or to the right for more up-todate indexes and faster searching. Click *OK* as required to close all dialog boxes. You're off and running: Restart the service to apply your changes: Right-click *Indexing Service* and choose *Start*. With Indexing Service selected in the Computer Management tree, the right pane will show how many documents you've designated for indexing and the number of documents that remain to be scanned.

Find files mentioned in this article at www. pcworld.com/downloads, and find more tips at www.pcworld.com/heres\_how. We pay \$50 for published tips and questions. Scott Dunn is a contributing editor for PC World.

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# **INTERNET TIPS**

KEEP TABS ON YOUR COOKIES

SCOTT SPANBAUER

GOOGLE BRINGS BACK DEJANEWS OUTLOOK EXPRESS MINUS THE BRAND

# Simple Instant Messaging With a Universal Client

AS IF E-MAIL, the Web, and streaming media weren't reason enough to stay glued to your PC, another hot Internet application—instant messaging—would like to construct a little birdhouse in what is left of your soul. Experts who follow the technology agree that IM is on its way to ubiq-

uity, thanks in part to growing support for wireless phones and handheld PCs.

If you're about to test the IM waters, you'll need an account with one or more popular services, and client software that lets you start yakking. Unfortunately, each of the major IM client programs—AOL Instant Messenger (AIM), ICQ, MSN Messenger, and Yahoo Messenger—is chauvinistic and can't communicate with the other systems' users. Who wants to run four separate IM apps at one time?

Fortunately, third-party IM clients, such as Odigo Messenger, Jabber Instant Messenger, and Imici Messenger let you connect with users of multiple IM systems. These clients have features that may not be offered by an IM system's own client, including support for other operating systems and device types (see **FIGURE 1**). And like the native IM clients, all are freeware. Find them at PCWorld.com's Downloads (www.pcworld.com/downloads).

The promise of a single IM client that



works with all four major services is enticing, but don't delete your service's native client program. Only Imici Messenger of all third-party clients currently emulates AIM, ICQ, MSN Messenger, and Yahoo Messenger; another client (one that's still in the beta stage), Cerulean Studios' Trillian, aims to do the same thing. Furthermore, no

developer can guarantee that its universal client will always work with AIM. America Online actively thwarts third-party access to AIM servers by changing the IM protocol frequently, though the company claims to work with AIM licensees. Thirdparty clients will require an update (usually a downloadable patch) to continue working after AOL makes a change. And until the vendor deciphers the new protocol and updates its client, you'll need your copy of AIM handy. You'll also want an emergency backup client handy in case your third-party client's vendor goes belly up—as happened to Tribal Voice, maker of one of last year's most promising universal IM clients, PowWow.

#### THE SECRET LIFE OF COOKIES

IN INTERNET EXPLORER'S Tools-Internet Options box, whether I click the General tab's Delete Files button or check the Advanced tab's 'Empty Temporary Internet Files folder when browser is closed' security setting, I still find that cookies aren't deleted from the folder. However, if I simply delete the content of the Temporary Internet Files folder, I also delete the cookies I want to keep. Any suggestions?

Dave Alfano, New Castle, Colorado FIRST, I'D recommend that you employ a cookie management utility, such as The Limit Software's Cookie Crusher (available at www.thelimitsoft.com or PC-World.com's Downloads). These utilities let you specify in advance the cookies you'll accept and those you'll reject. The Security tab in IE's Internet Options lets you specify one of only three options: to accept all cookies, to accept none, or to be prompted about each one. The last choice is interesting for a few minutes-the number of cookies Web sites write to your hard disk is shocking-but it's ultimately too time-consuming for most users.

As to where the cookies are stored, that's a complex issue. In addition to the Temporary Internet Files folder you'll find a Cookies folder, and both fold-

# ILLUSTRATION: FELIX SOCRWELL

#### INSTANT MESSAGING CLIENTS

NATIVE CLIENTS	Download URL; size	Works with	Other supported platforms
AOL Instant Messenger	www.aim.com; 2.33MB	AIM	Browser, Linux, Palm, PocketPC/Win CE
ICO	www.icq.com; 5MB	ICO	Browser, Palm, Win CE 2.x
MSN Messenger	messenger.msn.com; 748KB	MSN	Browser
Yahoo Messenger	messenger.yahoo.com; 1.8MB	Yahoo	Browser, Linux, Palm, PocketPC/Win CE, RIM page
UNIVERSAL CLIENTS			
Imici Messenger	www.imici.com; 585KB	AIM, ICO, MSN, Yahoo	FreeBSD, Linux
JabberIM (JIM)	www.jabber.org; 1.5MB	ICO, MSN, Yahoo	Browser, Linux, Palm
Odigo Messenger	www.odlgo.com; 4MB	AIM, ICO, Yahoo	Browser, WAP phone

FIGURE 1: UNIVERSAL IM CLIENTS such as Imici, JabberIM, and Odigo let you hook up with more services, but the native AIM, ICO, MSN, and Yahoo clients support more platforms.





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#### GOOGLE GROUPS: DEJANEWS ALL OVER AGAIN

ONCE UPON A TIME, there was a wonderful Web site called DejaNews, where you could search for anything anyone had ever posted to the thousands of public newsgroups called Usenet. Then one day the proprietors of DejaNews realized that the only way they could make money from the site was to sell it to the folks at Google, who promptly removed much of the archived material and guashed users' ability to post their own messages through the Web site. At last, the archive is back. You can once again find that embarrassing flame you posted in 1996 (the archive goes back to 1995) by browsing to groups.google.com. Google says it plans to reenable the ability to post messages soon.

ers' locations vary depending on your version of Windows. Each folder also has some special attributes—if you attempt to make them read-only, for example (an old cookie-busting trick), Windows automatically removes the read-only attribute for you. And as you discovered, the Delete Files button doesn't delete all files.

If you would rather not use a cookie buster, I suggest that you disable cookies instead. Go back to IE's Internet Options,

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C Outron C Sent Dens C Delated Tems C Duats	E-mell There are 13 unread Had messages in your index D Create a part Had message Fact Had	Tip of the day X Outlook Express internationally checks for new
Contacts = 3 There are no contacts to display. Out on Contacts to create a new contact.	Newsgraups	To change this setting, click the

FIGURE 2: DE-BRANDING, PART TWO: Get ISP ads out of Outlook Express's title bar with a Registry tweak.

and on the Security tab, select the *Internet* zone. Click the *Custom Level* button, scroll down to the Cookies settings, set both stored and per-session cookies to *Disable*, and then click *OK* twice. The next time you want to use a site that requires you to allow it to set a cookie before permitting you to access its content, simply go back

to the Security tab and set your cookie security to *Prompt*. After you've browsed the site, reinstate the Disable setting.

#### **DE-BRAND OUTLOOK EXPRESS**

DOZENS OF READERS wrote to say that they appreciated May's tip for removing ISP branding from Internet Explorer (see "De-brand, Re-brand Internet Explorer" at find.pcworld.com/10684), but they didn't think it went far enough. If your copy of Outlook Express says that it's provided by AT&T WorldNet or America Online, the iedkcs32.dll utility mentioned in May's column won't do much about it. Lucky for us, Savannah, Georgia, reader Bill Miller has a solution: Search the Windows Registry for the string-value key that sets the title bar text, and either edit the text it specifies or remove the key altogether.

To open the Registry Editor, choose Start-Run, enter regedit in the Open field, and click OK. You can find the Window-Title key by pressing **<Ctrl>-F**, entering **WindowTitle** (no space between the two words) in the 'Find what' field, and clicking OK. After some disk crunching, you should see a key called WindowTitle at the end of a Registry path that contains the words 'Outlook Express'. The exact path you see will vary, depending on the versions of Windows and Outlook Express you use.

To edit the WindowTitle key, double-

click it, replace the text in the 'Value data' field with whatever you want, and click *OK*. The change takes effect when you launch Outlook Express (see FIG-URE 2). To delete the brand text and restore the default OE title bar message ("Outlook Express"), right-click the *Window-Title* key and choose *Delete*.

If you have multiple Outlook Express identities, you're still not done yet. Each OE identity

has a similar WindowTitle key. Press **<F3>** to locate the next one, and edit or delete it in the manner just described.

Scott Spanbauer is a contributing editor for PC World. Send your Internet-related questions and tips to nettips@spanbauer.com. We pay \$50 for published items.

#### DOWNLOAD OF THE MONTH

#### **Revision Control**

STARTING WITH this issue, *Internet Tips* will occasionally list key updates to some popular Net-related freeware. You'll probably recognize most of them, so we'll just identify the version number, how big it is, where to find it, and what's new. Write in if you think we're forgetting something.

Internet Explorer 5.01 Service Pack 2; 6MB to 17MB find.pcworld.com/10690 Internet Explorer 5.5 Service Pack 1; (size unknown) find.pcworld.com/10699

Both updates shower your browser with bug and security fixes, and upgrade you to 128-bit security if you're not there already. To find your current IE version, choose *Help*•About Internet Explorer.

Netscape Communicator 4.77; 16.9MB (base install), 22.3MB (complete install)

Bitten by bugs in 4.76? Version 4.77 contains bug fixes and the latest version of AOL Instant Messenger. Choose *Help*• *Software Updates* in your current version of Netscape for the smallest possible download, or visit these Web addresses.

Base: find.pcworld.com/10693 Complete: find.pcworld.com/10694

#### Musicmatch Jukebox Basic 6; 9.4MB find.pcworld.com/10695

The new version of this MP3 player has a better interface and MP3 streaming.

#### Winamp 2.76; 2.2MB (full version) find. pcworld.com/10696

Lots of fit-and-finish bug fixes-dozens if you haven't updated recently.

#### Adobe Acrobat Reader 5; 10MB find. pcworld.com/10697

Adds user interface improvements, clearer type, and the ability to save PDF files downloaded to your browser.

#### Opera 5.11; 9.5MB find.pcworld.com/ 10698

Skins, Flash support, new privacy controls, and bug fixes significantly improve this ad-supported browser from Norway.

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# HARDWARE TIPS

KIRK STEERS

MATCH YOUR UPS TO YOUR PC USB 2.0 VERSUS FIREWIRE DEVICES PRINT WITHOUT PAGE BORDERS

# Conserve Energy With a PC Power Regimen

THE ONLY PLACE you used to have to worry about your computer's power consumption was in midflight at 35,000 feet. Today's blackouts, brownouts, and skyrocketing electricity rates have brought those concerns down to earth. Managing your desktop PC's appetite for electricity can save you money, extend the system's life, and prevent data loss.



The flow of electricity is measured in watts. Your hard drive uses between 5 and 25 watts, your CPU between 20 and 45 watts, and your 17- or 19-inch monitor from 80 to 150 watts. A well-equipped PC running at full steam will burn from 200 to 300 watts—and sometimes more.

Power-company charges are based on the number of kilowatt-hours you use. My last electricity bill charged 15 cents per kilowatt-hour, but increases are expected. (That doesn't include transmission and distribution charges and other fees and taxes, all based on usage.) My PC and monitor use about 250 watts at full bore, or almost 4 cents an hour.

Sound like small change? If your PC's turned on for an average of 40 hours a week, your PC energy bill could be about \$80 a year. If you keep your PC for three years, the cost of powering it could represent 15 to 25 percent of its original price.

Most PCs now support either Advanced Power Management (APM) or the Advanced Configuration and Power Interface (ACPI). To check your PC, select *Start-Settings-Control Panel-System*, click the *Device Manager* tab, open the *System devices* listing, and look for entries with either 'APM' or 'ACPI' in the name. If you don't find either, power management may be disabled or not installed on your PC—and enabling it can be tricky.

APM, the older and less flexible standard, has five settings, ranging from full on to APM off (see **FIGURE 1**). Adjust the settings in either the CMOS setup program or Control Panel's Power Management utility. The settings can conflict, however, so you may have to experiment.

Open your system's CMOS setup pro-

gram—typically by pressing **<Delete>** or **<Fi>** as the PC boots up—and go to the Power Management menu. If there's no menu specifically for power, look through the other menus; you're certain to find something. When you do, choose the option that enables APM. If this causes problems, force your PC to use the earlier—and potentially more compatible—APM version 1. Go back to Device Manager and choose Advanced Power Management support under 'System devices'. Choose the Settings tab and then check Force APM 1.0 mode (see FIGURE 2).

If your PC is fairly recent, it may support the newer ACPI specification, which is part of the OnNow effort by Microsoft

Advanced Power Management s	upport Properties	? ×
General Settings Driver		-
Advanced Power Manage	ement support	
APM version: 1.2		
APM version: 1.2		1

#### FIGURE 2: YOU MAY SOLVE power problems by forcing your PC to use APM version 1.

and others to make PCs easier to use and to let them boot up and shut down faster.

ACPI's Standby mode makes restarts easy, and it allows a PC to "wake up" automatically to process e-mail, modem calls, prescheduled tasks, and other external input. It improves on APM by letting you control the power consumption of individual components. At the very least, Control Panel's Power Management utility should offer power control over the hard disk and the monitor (see **FIGURE 3**).

You'll conserve the most power by setting your monitor to power down. Some 19-inch monitors devour up to 150 watts. Powering down is much better than running a screen-saver program. You'll extend your monitor's life while suppressing its voracious appetite.

#### ADVANCED POWER MANAGEMENT STATES

Full on	System is fully on; no power management.
APM enabled	Full power; APM running.
APM standby	Some devices are powered down or run with reduced power; system has minimal functionality but quickly returns to a running state.
APM suspend	Deep sleep, maximum power saving; system is nonfunctional but can be restored to previous working state after a longer wait.
APM off	System is completely off; no power management.

FIGURE 1: THE ADVANCED POWER MANAGEMENT standard lets you choose one of five PC power-conservation settings.

Select the po this computer the selected	tcheme.	nging the settings be	
Home/Office Desk			
		Save As	Delete
Settings for Home/Of	ice Desk powe	s scheme	
System standby:	Alter 20 mi	ns	
Turn off genitor:	After 15 mi	15	*
Turn oll hard disks.	Alter 30 min	nt	

FIGURE 3: SET YOUR MONITOR and hard disk to shut down automatically when they're not in use.

#### WHEN THE LIGHTS GO OUT

TO PROTECT YOUR PC's circuits from the voltage spikes that can accompany a sudden power loss, make sure that you have a high-quality surge protector installed between your PC and the wall socket. It should meet Underwriters Laboratories' UL 1449 standard, with a rated response time of no more than 1 nanosecond. A worthy candidate will cost at least \$40.

For added power protection, use an uninterruptible power supply, which can provide electricity for several minutes when your wall socket suddenly runs dry. Those few minutes of power should be enough to let you save your recent work and to allow Windows to shut down properly. Some UPSs come with software that saves your work and shuts Windows down for you if the power fails while you're not around. UPSs cost as little as \$100, but don't be too frugal: A device that can't meet your system's wattage needs won't be much use.

Keep in mind that a UPS has to run both your PC and your monitor. A standard PC with a 17-inch monitor can overwhelm a low-end UPS. To determine your system's wattage requirements, add the maximum wattage rating of your PC's power supply (usually listed on the power-

supply case or in your PC's documentation) to your monitor's wattage requirements (look for watt, voltamp, or VA numbers on the back of the monitor). (Note: The monitor's voltage may be a range, as in 100V–120V, listed separately from the amperage, as in 1.6A; in this case, multiply the amps by 90.) Add 20 percent to the total as a safety factor. Don't connect any printers, scanners, or other devices to the UPS.

Compare your wattage needs with the output and running time of the UPS. The model you select should last at least 10 minutes running at the wattage requirements of your PC and monitor. One more thing to look for: UPS vendors commonly list running times at *half* load, so a UPS with a

rated output of 300 watts will list a running time for a *half* load of only 150 watts.

#### **USB 2.0 OR FIREWIRE?**

I WANT TO ADD a fast, easy-to-use bus to my PC so I can use an external hard drive or external CD-RW drive. I was going to add a FireWire card to my system, but I recently heard that USB 2.0 is just as fast and is currently available. Is this true? And which do you recommend?

Douglass Preston, Duluth YOU'RE RIGHT about speed. The newest version of USB—dubbed High-Speed USB by marketers—is a little faster than the existing IEEE 1394, or FireWire, standard. USB 2.0 has a theoretical maximum throughput of 480 mbps, surpassing FireWire's 400 mbps maximum. (That's 40 times faster than current USB ports.)

USB 2.0 is an excellent way to connect hard drives. CD-RW drives, and other data-hungry peripherals, in addition to accommodating the mice, keyboards, and lesser devices served by the original USB technology. But to take advantage of USB 2.0, you need to have a working USB 2.0 port, a USB 2.0–capable operating system, and, of course, USB 2.0 devices such as hard disks and CD-RW drives.

PCs with built-in USB 2.0 ports won't

be on the market until

next year, but you can

add a USB 2.0 adapter

USB 2.0 5-Port PCI Hub Street: \$60; SIIG, www.silg.com PRINT THE UNPRINTABLE

ALMOST EVERY printer has an unprintable border area for each page it prints. Check your printer's manual for its minimum settings and make sure they match the settings listed in Windows under Unprintable Area. Click Start-Settings-Printers to open the Printers dialog box. Select your printer and choose File-Properties. Click the Paper tab. If the settings are too high, lower them to increase the printable area of each page. Be sure you don't lower them past the limits in the manual, however, or you may lose printed text or graphics.

card to your current PC. SIIG'S USB 2.0 5-Port PCI Hub is one of several PCI adapter cards that have been on sale since April. USB 2.0 hard disks are still hard to find, though they should be on store shelves in increasing numbers late this year or early next year.

The biggest question mark, however, is the availability of USB 2.0 software drivers for Windows 98, Me, and XP. Microsoft has announced that it won't issue any USB 2.0 drivers for Windows 98 or Me leaving that to third-party developers nor will it issue them for the initial distribution of Windows XP later this year. But Microsoft affirms its full support for the technology and says that it hopes to issue USB 2.0 drivers for Windows XP soon after that OS launches.

If you're not in a hurry to add a fast bus to your PC, wait for USB 2.0 drivers and products. All USB 2.0 devices should be backward-compatible with USB 1.1, so you can use them at slower speeds until the proper drivers appear. In the long run, you'll probably find a greater selection of hardware available for USB than for Fire-Wire. However, many digital video cameras have standardized on FireWire. If you're into video or you can't wait for USB, FireWire is your best bet.

For other hardware tips, see www.pcworld. com/heres\_how. Kirk Steers is a PC World contributing editor. Hardware Tips welcomes your tips and questions and pays \$50 for published items.

# **ANSWER LINE**

LINCOLN SPECTOR

KEEP YOUR CD-R DATA ACCESSIBLE PASTE IN WORD MINUS FORMATTING AN MSCONFIG FOR WIN 95 AND 2000

# Can You Trust Important Data to CD-Rs?

ARE CD-R DISCS a dependable medium for preserving digital photos, MP3s, and other key files?

Kenneth Collins, Hockessin, Delaware MOST CD-R manufacturers claim that their premium discs will last 100 years, if properly cared for. Mark Roosa, preservation director for the Library of Congress, is guardedly optimistic about the claim's

CDCheck - Done			- D ×
Aboxt C <sup>1</sup> Options E Eact     Fles     Tes     Tes     Tes     Total CP01     TwinkE P01     Aboxt P01     Inpotent Fects bt	Remaining : Total	Transfer rate (I	Close kB7s] :1 :4 :1
File name	Error mezzage		0
ENtrotitant Potentia Check again Rescue like Copy errors and statistics to Save errors and statistics to	clipboard	ontent mismatch	

FIGURE 1: ALWAYS USE CDCheck to confirm that your CD-R files are readable and have been copied accurately.

accuracy. "If you put [a CD-R] into cool and dry storage, it's quite possible that it will last for 100 years." Here are some tips for keeping your CD-R data safe.

Buy good discs: Get premium CD-Rs from companies that make their own discs. (Don't use CD-RWs, since they aren't designed for long-term storage.) Katherine Cochrane, a consultant who specializes in CD technology, is impressed with some of the discs she has tested from Kodak, Mitsui, and Fuji. Other companies whose discs have good reputations include Verbatim and Maxell. Check the newly written disc for errors: CDCheck, a free program from Fusion, lets you compare the CD's files to the original source files on your hard drive (see FIGURE 1). Find it at PCWorld.com's Downloads and at fusion.zejn.si.

Make more than one copy: Put the same files on at least two CD-Rs. If the CD will be used a lot, make three copies—one for

> use and two for archiving. Handle discs with care: Treat the disc as you would a photo negative. Never touch the data surface or lay the surface down. Label with care: Use a pen designed for CD-Rs, such as CD Mark from TDK. Or use labels intended specifically for CDs and apply them carefully. Better yet, follow Cochrane's advice: "Leave the disc unlabeled and just label the packaging."

Store them properly: Keep discs

in their jewel cases when not in use, and store the case in a cool, dry, dark location. An office bookshelf (out of direct sunlight) should work fine. Be sure to store the second copy in another building. **Check them regularly:** Every couple of years, pull the CDs off your shelf and make sure you can still read them. If you encounter an error, replace the disc with a new one duplicated from your other copy. (That's why you make two.) Consider obsolescence, too. If the medium or file format is falling out-of-date, transfer the data to a new storage device that's at least as reliable as the one it's replacing.

#### PASTE PLAIN TEXT INTO WORD

I SOMETIMES PASTE formatted text into Word when all I want is the text, not the formatting. Is there a way to strip out that formatting as I paste it? Jamal H. Khan, San Jose, California

YOU CAN SET UP Word 97 or 2000 to insert unformatted text with a keystroke. In Word, select some text and press <Ctri>-C to copy it. Click Tools-Macro-Record New Macro (in Word 2000, you may have to extend the Tools menu to see the Macro option). In the Macros dialog box's name field, enter PlainPaste. Click the Keyboard button to get the Customize Keyboard dialog box. In the 'Save changes in' dropdown menu, select Normal. Put the cursor in the 'Press new shortcut key' field, and press <Alt>-V. Click the Assign button, then Close. There will now be a small, TVshaped floating toolbar on Word's screen. Select Edit-Paste Special, and double-click Unformatted Text. Click the Stop Recording button (the solid square) on the toolbar. Henceforth, <Alt>-V will act as a keyboard command to paste unformatted text.

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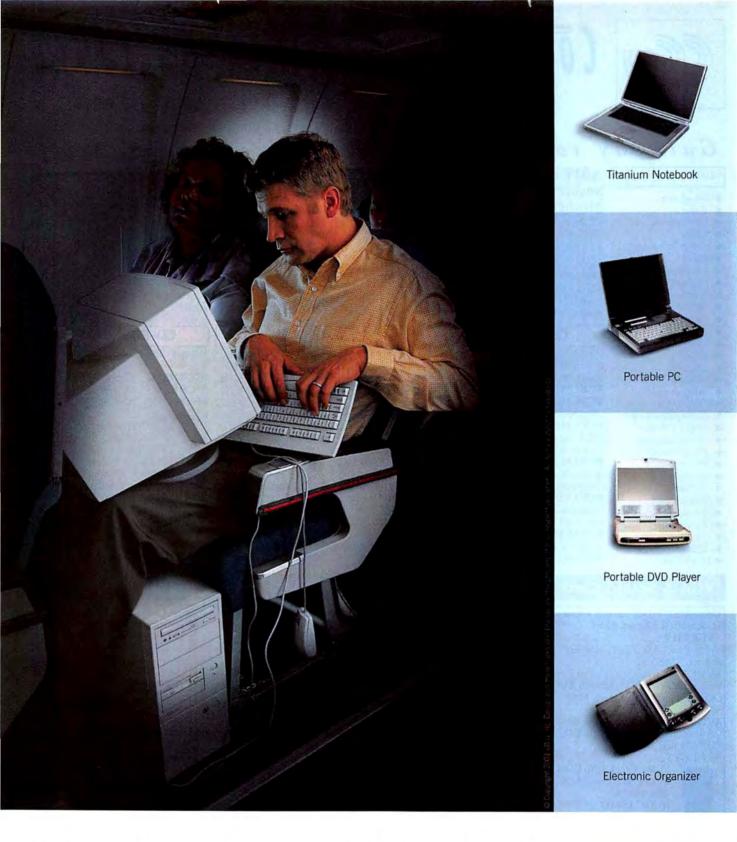
#### MSCONFIG FOR WINDOWS 2000 AND 95

WINDOWS 98 AND ME have a wonderful tool for controlling which programs load automatically when you boot: Msconfig. But if you use Windows 95 or 2000, you're out of luck. To get Msconfig-like features that work with those OSs, try Mike Lin's free substitute, the Startup Control Panel. You can obtain it from PCWorld.com's Downloads and from the designer at find.pcworld.com/11204. One version installs into Windows' Control Panel; the other, an executable file (.exe), runs on its own. The program also does tricks that exceed Msconfig's abilities, such as letting you set something to run only at the next boot.



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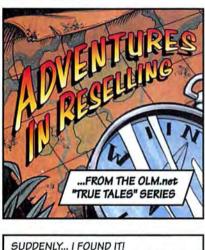
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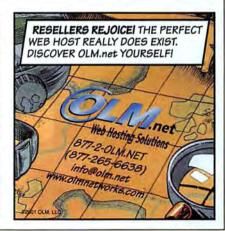
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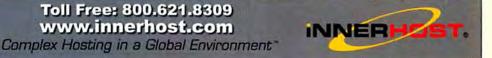
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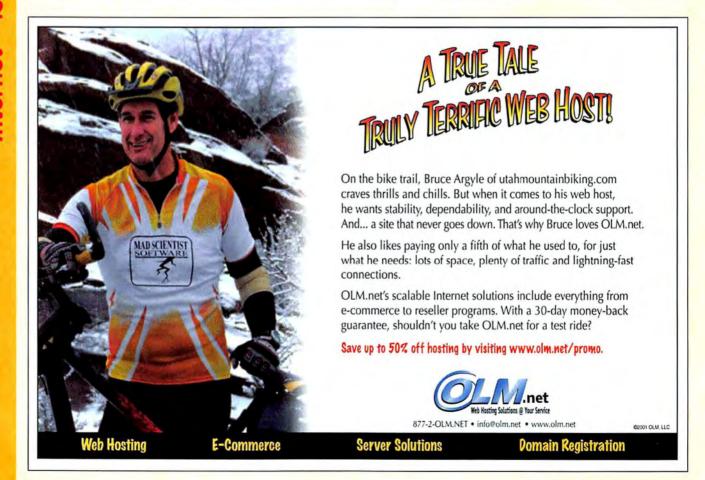
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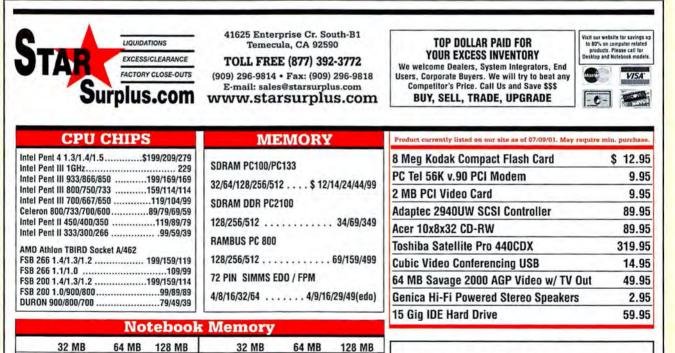
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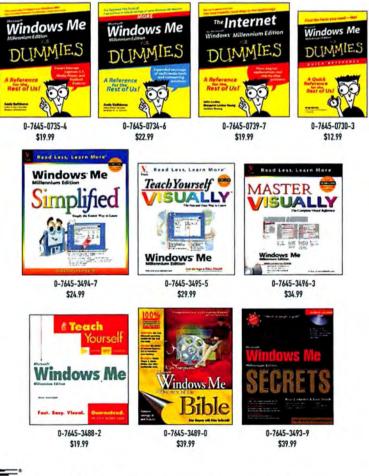
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# Upgrades: The Senseless and the Sensible

MORE OFTEN THAN I EXPECT, I get mail that boils down to something like this: "I have a ten-year-old 386 PC with 16MB of RAM running Windows 3.0. How can I upgrade it to work with today's software and hardware?" The short, snotty answer: Use it as a stand for a new machine.

In the DOS days, it was different. By the time my original IBM PC was seven years old, it was the King of Upgrades. I had swapped out the original text-only video board in favor of one that could do monochrome graphics. An amazing 20MB hard-drive card whirred in a neighboring slot. Beside it stood a multifunction card that boosted the original 64KB of memory tenfold and added a serial port

for the outboard modem. I'd even performed a PC brain transplant: In the socket where the poky 8088 processor originally resided sat a

connector cabled to a blazingly fast 80286 on its own card. The machine may have had an IBM logo on it, but when I was through with it, the thing was virtually a Stephen Manes autograph model.

Back then, internal upgrades made sense. Today, in a world of dizzying deflation for every part in the box (aside from monopoly-priced software), they generally don't, except to stave off the horrible experience of reinstalling your data and programs on a new machine. My advice: Avoid that, and the upgrades themselves, by buying more machine than you think you need. (And yes, I'm well aware that a sizable chunk of this issue of *PC World* is devoted to an upgrade guide.) Which upgrades still pay off? Ones that add new functionality.

Start with enough memory in the box, and you'll avoid the hassle of figuring out which stick of add-in RAM you need and of deciphering the baffling diagrams that purport to show you how to install it. Buy enough storage in the first place, and you won't have to worry about the goofy errors that inevitably arise from full disks or fiddle with cables, screws, and software to install a second drive (assuming there's room for it). Get a read-only optical drive -CD-ROM or DVD-ROM-plus another that's recordable, and you'll be able to copy disks from one to the other with relative ease. Demand a network interface. and you won't need to install one later or

mess with USB-to-ethernet kludges. And if you buy a PC with extra bays and slots, you can still upgrade if you must.

Few upgrades—especially processor add-ins—deliver enough speed to justify their cost. Hard drives don't add much performance, either. True, if you're woefully short of RAM—say, under 256MB adding more should make things zippier. But otherwise, performance is basically limited by what you buy at the outset.

Hard-disk space is different: More is more. But unless you're a video or music junkie, you may well need a new PC before you fill up one of today's big drives. So which upgrades still pay off? External peripherals often do. Monitor prices have dropped so much that unless you own an iMac you no longer have any excuse for enduring a dinky, secondrate 15-inch screen. Printers keep improving, too, particularly for color photos. Modern dirt-cheap scanners often beat ancient expensive models.

The most useful upgrades add functionality. Today, the most important of all involve connectivity, such as fast cable or DSL hookups and ways to network your machines (with or without wires) so they can share in the upgrade from dial-up. And if you've already got the hottest PC on the block but still have an urge to upgrade, there's always one long-lasting improvement that can be the most consistently satisfying of all: a new chair.

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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#### 999 3 E-VALUE CODE 03892-590809 BUSINESS LEASE: \$28/MO., 48 MOS

- MS\* Windows\* 2000 Professional, add \$99
- 3-Yr NBD On-Site Service, add \$119
- Lexmark<sup>™</sup> E312L Laser Printer, add S269

#### DELL" OPTIPLEX" GX150

#### Network-Optimized Managed PC

- Intel<sup>®</sup> Pentium<sup>®</sup> III Processor at 1.0GHz
- 128MB Shared<sup>30</sup> SDRAM (up to 512MB) 20GB<sup>s</sup> (7200 RPM) ATA/100 HD
- 17" (16.0" vis) E771p Monitor
- Integrated 3Com<sup>e</sup> 10/100 NIC
- Integrated Graphics with 4MB Graphics Performance Accelerator
- 48X Max CD-ROM
- Integrated AC97 Audio
- MS\* Windows\* 2000 Professional OptiFrame<sup>\*\*</sup> Small Mini-Tower Chassis
- 3-Yr NBD On-Site Service<sup>4</sup>

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- APC<sup>®</sup> SurgeStation Pro8T2 (8 Outlets), add \$39
- Upgrade to Sony Trinitron\* P780 Monitor. add \$100

#### DELL" INSPIRON " 8000

#### Pinnacle of Performance Notebook

- Intel\* Pentium\* III Processor at 1.0GHz
- 15" Super XGA TFT Display
- 128MB 100MHz SDRAM
- 10GB<sup>5</sup> Ultra ATA HD
- Fixed Internal 24X Max Variable CD-ROM
- Modular Floppy Drive
- 16MB ATI\* Mobility "-M4 3D\* Video, 4X AGP
- 59WHr Li-Ion Battery w/ExpressCharge<sup>™</sup> Technology
- Internal Mini-PCI 56K Capable<sup>®</sup> Modem
- MS\* Office XP Small Business
- MS\* Windows\* Me
- 1-Yr Ltd Warranty, 1-Yr Mail-in Service, 1-Yr Phone Tech Support

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NEW Fixed Internal CD-RW/DVD Combo Drive, add \$299

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NEW—Small Business Value Server Intel<sup>®</sup> Pentium<sup>®</sup> III Processor at 933MHz

128MB 133MHz ECC SDRAM (up to 2GB)

9GB<sup>o</sup> (10K RPM) Ultra3 (Ultra 160) SCSI HD

Embedded Ultra3 (Ultra 160) SCSI Controller

99 3 E-VALUE CODE 03892-290809

Dell<sup>™</sup> OpenManage<sup>™</sup> Server Management

3-Yr NBD Bronze On-Site Service<sup>4</sup>

BUSINESS LEASE: \$28/MO., 48 MOS." 2nd 9GB<sup>1</sup> (10K RPM) Ultra3 SCSI HD, add \$249

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Dell computers are available pre-loaded with Microsoft Windows 2000 Professional, which is over 13 times more reliable<sup>43</sup> and up to 30 percent faster\* than Windows 98. Add MS Windows 2000 to your Dimension desktop or Inspiron notebook for \$99.

Dual Processor Capable

(up to 36GB<sup>1</sup> 10K RPM)

7x24 Phone Tech Support

48X Max IDE CD-ROM

#### DELL" LATITUDE \*\* C500

#### NEW-Wireless-Ready Value Notebook

- Intel® Celeron™ Processor at 700MHz
- 12.1" SVGA Active Matrix Display (14.1" XGA Available)
- 64MB SDRAM = 6GB<sup>o</sup> Ultra ATA HD
- 8MB ATI\* Mobility<sup>™</sup> 128 Video, 2X AGP
- MS\* Windows\* 98, Second Edition
- Modular 24X Max CD-ROM/Floppy Drive
- Internal Mini-PCI 56K Capable<sup>6</sup> SoftModem
  - Li-Ion Battery w/ExpressCharge<sup>™</sup> Technology
  - Dual Pointing Touchpad and Pointing Stick
  - 1-Yr NBD On-Site Service\*

#### 5 299 O E-VALUE CODE 03892-790812

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

- 14.1" XGA Active Matrix Display, add \$150
- Deluxe Nylon Carrying Case, add \$69

DELL<sup>16</sup> PRECISION<sup>16</sup> 330

Advanced Performance Workstation

Intel<sup>®</sup> Pentium<sup>®</sup> 4 Processor at 1.4GHz

Desktop Chassis in Midnight Gray

128MB PC800 RDRAM (up to 2GB)

MS\* Windows\* 2000 Professional

7x24 Dedicated Workstation Phone

BUSINESS LEASE: \$33/MO., 48 MOS." Monitor Sold as an Upgrade.

\$199 O E-VALUE CODE 03892-490811

NVIDIA® TNT2 Pro 16MB 4X AGP Graphics Card

Integrated NIC & Sound = 48X Max CD-ROM

Single Processor/RAID Capable

20GB<sup>5</sup> (7200 RPM) EIDE HD (up to 73.4GB<sup>1</sup> 10K RPM SCSI)

3-Yr NBD On-Site Service<sup>4</sup>

Tech Support

(up to 1.8GHz)

#### **DELL<sup>®</sup> SERVERS AND WORKSTATIONS:**

#### DELL" POWEREDGE 500SC NEW-Basic Server at Our Lowest Price

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10GB<sup>5</sup> (7200 RPM) IDE HD

7x24 Phone Tech Support

48X Max IDE CD-ROM

64MB 133MHz ECC SDRAM (up to 2GB)

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BUSINESS LEASE: \$19/MO., 48 MOS."

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#### Affordable Desktop Solution

- Intel<sup>®</sup> Pentium<sup>®</sup> III Processor at 1.0GHz ■ 128MB Shared SDRAM<sup>™</sup> at 100MHz
- 20GB<sup>1</sup> Value HD
- 17" (16.0" vis) E770 Monitor
- Integrated Intel<sup>\*</sup> 3D<sup>\*</sup> AGP Graphics
- 48X Max CD-ROM Drive
- Sound Blaster\* 64V PCI LC Sound Card
- Harman Kardon\* HK-195 Speakers
- 56K Capable<sup>®</sup> PCI DataFax Modem
- MS<sup>®</sup> Works Suite 2001 MS<sup>®</sup> Windows<sup>®</sup> Me
- 1-Yr Ltd Warranty<sup>2</sup> = 1-Yr At-Home Service<sup>4</sup>
- 6 Months of DellNet" by MSN\* Internet

#### Access<sup>10</sup> Included \$799 of as low as \$24 per mo. 45 mos."

No payments for 90 days." E-VALUE Code: 03892-500807c

#### DELL" DIMENSION # 4100 Series

Advanced Performance, Smart Value

- Intel\* Pentium\* III Processor at 1.0GHz
- 128MB SDRAM at 133MHz
- 20GB<sup>5</sup> Ultra ATA/100 HD (7200 RPM)
- 17" (16.0" vis, .28dp) E770 Monitor
- 16MB ATI\* Rage'\* 128 Pro
- 8X/4X/32X CD-RW Drive
- SB Live! 1024 Digital Sound Card
- Harman Kardon<sup>®</sup> HK-195 Speakers
- 56K Capable<sup>®</sup> PCI Telephony Modem
- MS\* Works Suite 2001 = MS\* Windows\* Me
- 1-Yr Ltd Warranty' 1-Yr At-Home Service\*
- 6 Months of DellNet" by MSN\* Internet Access<sup>10</sup> Included

#### \$1099 or as low as \$33 per mo. 45 mos."

- No payments for 90 days." E-VALUE Code: 03892-500810a
- 19" (18.0" vis, .26dp) M991 Monitor, add \$140

#### DELL" DIMENSION" 8100 Series

#### Cutting-Edge Technology

- Intel<sup>®</sup> Pentium<sup>®</sup> 4 Processor at 1.5GHz
- 128MB RDRAM
- 40GB<sup>1</sup> Ultra ATA/100 HD (7200 RPM)
- 19" (18.0" vis, .26dp) M991 Monitor 32MB NVIDIA\* GeForce2 MX 4X AGP
- Graphics Card with TV Out
- NEW 16X Max DVD-ROM Drive
- SB Live! 1024 Digital Sound Card
- Harman Kardon\* HK-695 Surround Sound Speakers with Subwoofer
- 56K Capable<sup>\*</sup> PCI Telephony Modem
- MS\* Works Suite 2001 MS\* Windows\* Me
- I-Yr Ltd Warranty<sup>1</sup> I-Yr At-Home Service<sup>4</sup>
- 6 Months of DellNet" by MSN<sup>®</sup> Internet Access<sup>10</sup> Included

# \$499 or as low as \$45 per mo, 45 mos.

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#### Great Notebook, Great Price

- Intel<sup>®</sup> Celeron<sup>™</sup> Processor at 800MHz
- 14.1" XGA TFT Display
- 128MB SDRAM
- 10GB<sup>s</sup> Ultra ATA HD
- Fixed 24X Max CD-ROM Drive
- Integrated Intel\* 3D\* AGP Video
- Internal 56K Capable<sup>®</sup> FaxModem
- 26.5WHr Li-Ion Battery
- MS\* Works Suite 2001 MS\* Windows\* Me
- 1-Yr Ltd Warranty<sup>2</sup> 1-Yr Mail-in Service
- 6 Months of DellNet" by MSN\* Internet Access<sup>10</sup> Included

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#### DELL<sup>™</sup> INSPIRON<sup>™</sup> 4000

#### Thin and Light

- Intel<sup>®</sup> Pentium<sup>®</sup> III Processor at 800MHz Featuring Intel® SpeedStep™ Technology
- 14.1" XGA TFT Display
- 192MB 100MHz SDRAM
- 20GB<sup>5</sup> Ultra ATA HD .
- Modular Removable 8X Max DVD-ROM Drive
- 2X AGP
- Internal 56K Capable<sup>®</sup> FaxModem
- 59WHr Li-Ion Battery w/ExpressCharge<sup>™</sup> Technology
- MS\* Works Suite 2001 . MS\* Windows\* Me .
- I-Yr Ltd Warranty<sup>2</sup> I-Yr Mail-in Service
- 6 Months of DellNet" by MSN\* Internet Access<sup>10</sup> Included



#### DELL<sup>™</sup> INSPIRON<sup>™</sup> 8000

#### Multimedia Mobile Desktop

- Intel<sup>®</sup> Pentium<sup>®</sup> III Processor at 1.0GHz
- 15" XGA Ultra TFT Display
- 256MB 100MHz SDRAM
- 20GB<sup>5</sup> Ultra ATA HD
- Fixed 8X Max DVD-ROM Drive
- 32MB DDR NVIDIA\* GeForce2 Go<sup>w</sup> 3D\* Video, 4X AGP
- Internal 56K Capable<sup>6</sup> FaxModem
- 59WHr Li-Ion Battery
- MS\* Works Suite 2001 MS\* Windows\* Me
- 1-Yr Ltd Warranty<sup>2</sup> = 1-Yr Mail-in Service
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- 20GB<sup>s</sup> Value HD
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- Integrated 3Com\* 10/100 NIC
- MS<sup>®</sup> Windows<sup>®</sup> Me & MS<sup>®</sup> Works Suite 2001 & Norton<sup>®</sup> AntiVirus<sup>™</sup>
- I-Yr Ltd Warranty<sup>2</sup> I-Yr NBD On-Site Service<sup>4</sup>

#### \$999 C E-VALUE CODE 03891-590809

#### BUSINESS LEASE. \$28/MG., 48 MOS."

- MS\* Windows\* 2000 Professional, add \$99
- 3-Yr NBD On-Site Service', add \$119
- Lexmark™ E312L Laser Printer, add \$269

#### DELL<sup>®</sup> DIMENSION<sup>®</sup> 8100 Series

1110

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#### Cutting-Edge Home Desktop

- NEW Intel<sup>®</sup> Pentium<sup>®</sup> 4 Processor at 1.4GHz
- 128MB RDRAM (up to 2GB)
- 40GB<sup>s</sup> (7200 RPM) Ultra ATA/100 HD
- 17" (16.0" vis) E770 Monitor
- 32MB NVIDIA\* GeForce2 MX 4X AGP Graphics
- 16X Max DVD-ROM
- Sound Blaster<sup>®</sup> 64V PCI Sound Card
- Harman Kardon<sup>®</sup> HK-195 Speakers
- 56K Capable<sup>®</sup> PCI Telephony Modem
- MS\* Windows\* Me = MS\* Works Suite 2001
- 1-Yr Ltd Warranty<sup>2</sup>
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