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07

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Ed Word

I'm all a-Twitter

Please send feedback and ice cream sandwiches to ***will@maximumpc.com.***

Every once in a while, I see something that is eminently cool that I don't know exactly how I'd use at first glance. Twitter (**www.twitter.com**) is just that sort of application. I liked it immediately, but it took a little pondering to figure out why it's awesome.

You see, this service gives me a simple way to keep track of my friends. I subscribe to their lists, and they subscribe to mine. When I send a text message to a special number (40404), Twitter automatically broadcasts my message to everyone who's subscribed to my Twitter feed. That sounds a little lame and annoying, I know. But let me give you a pair of real-world examples that show why it's addictive.

I'm ready to head out for a night on the town, but none of my pals knows exactly where we should go. So, we all head to our local watering holes. It's dead-quiet in my neighborhood bar, but my pal (we'll call him Barney) discovers pay dirt. Not only is there a great band playing in his favorite nighttime establishment, but he's also managed to score a booth in an impossibly full bar. With one quick text message he lets all of us know where he is and that he can hold down the booth for only another 15 or 20 minutes before the black-leather-jacket crowd moves in on his patch of Naugahyde paradise. This is undoubtedly a good, if somewhat frivolous, use of technology.

But Twitter's actually good for a lot more than that. Say you're at a convention in a strange city. You join the Twitter group set up for the conference, and you're instantly tapped in to a hardcore feed of frequently useful info from the Twitterati. There's no need to search for a good breakfast joint or an interesting panel—all the other attendees are broadcasting their discoveries, in real time, using their cell phones. That's useful *and* cool.

So, what are you waiting for? Go sign up for Twitter (and get your friends to sign up too—it's better with friends).

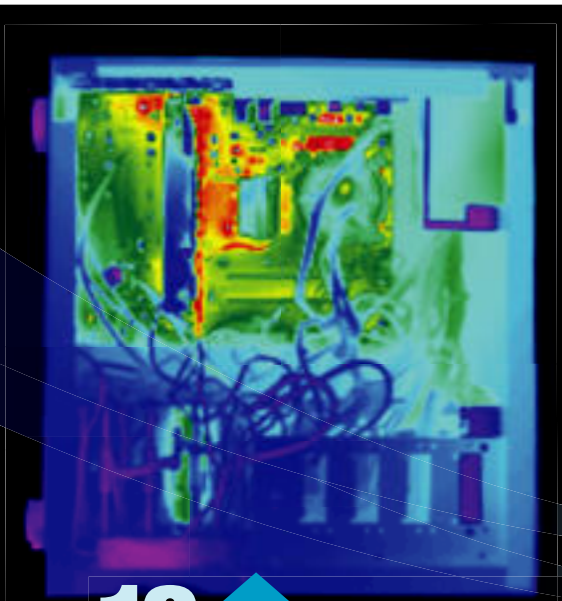
Got your Twitter account set up? Good! I think there's a better use for Twitter than telling my pals I'm getting a haircut. I'm going to use Twitter as a kind of anywhere worklog, posting my day-to-day work activities for all to see. I'd like to use Twitter to keep you guys tuned in to the *Maximum PC* beat 24 hours a day, seven days a week. If you're interested, feel free to subscribe to my Twitter feed—it's **http://www.twitter.com/willsmith/**.

And, if you think up exciting new ways to use Twitter (or any other nifty web app), let me know about them!

Will Smith

MAXIMUM PC 07/07

Features



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Future plc is a public company quoted on the London Stock Exchange (symbol: FUTR).

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Maximum PC ISSN: 1522-4279

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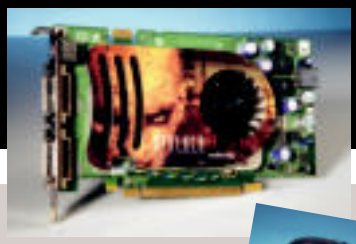

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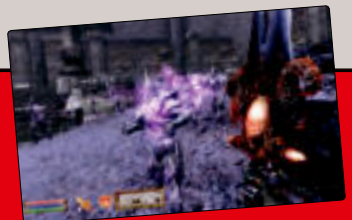
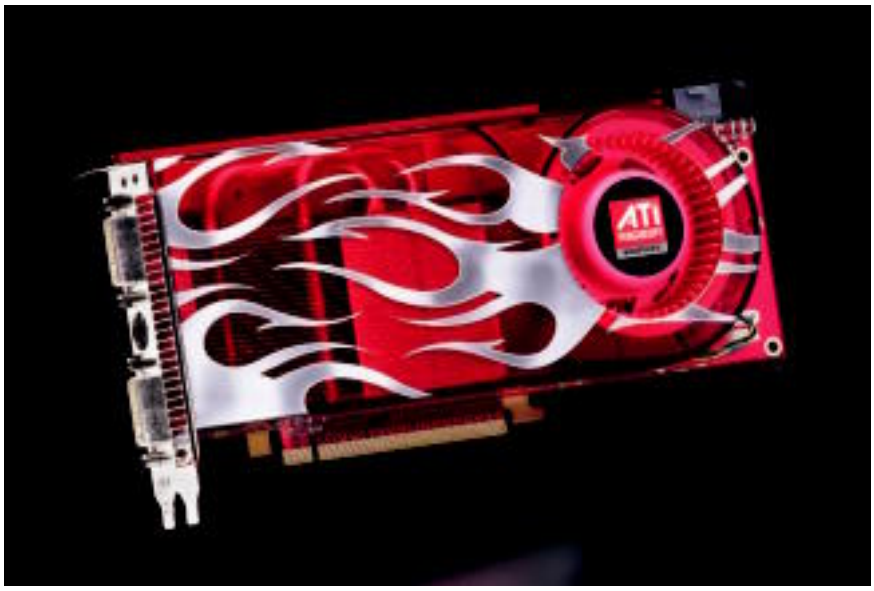


Gaming

AMD Surrenders!

Can AMD win the GPU war by ceding the battle for best high-end videocard to Nvidia?



The best videocard AMD will offer this season is designed to compete only with Nvidia's midrange part, the GeForce 8800 GTS 640MB.

AMD has decided it will compete with Nvidia in the first-generation DirectX 10 GPU market only at the mainstream level: Depending on how you look at it, and whom you ask, it's either a brilliant strategy or an admission of utter failure.

The top videocard AMD will bring to market this quarter is the ATI Radeon HD 2900 XT, a $400 card that will be positioned against Nvidia's similarly priced GeForce 8800 GTS. ATI will not only leave the high end of the market to Nvidia's GeForce 8800 GTX but also have no answer for Nvidia's even faster 8800 Ultra.

Optimists will say that $400 is the max that most people will spend for a videocard anyway, so AMD is smart for pursuing that sweet spot. Pessimists will declare that AMD is admitting defeat—that its engineers just can't compete with Nvidia at the high end. The truth lies somewhere in between.

There's no question Nvidia now rules the roost when judged solely on videogame frame rates, but AMD's entire line of new GPUs offers several compelling features that Nvidia's midrange—and even its best—cannot match. First and foremost: support for HDCP on dual-link DVI in order to support the native resolution of 30-inch displays.

ATI's new cards should also offload more HD video-decoding work from the CPU than Nvidia's best because Nvidia's second-generation PureVideo HD engine is available only on its otherwise lower-end GeForce 8500- and 8600-series parts.

AMD's best part will have a full 512-bit ring-bus memory interface to 512MB of GDDR3 memory. Compare this to the GeForce 8800 GTS, which has just a 320-bit interface to either 320MB or 640MB of GDDR3, and the GeForce 8800 GTX and 8800 Ultra, which have 384-bit interfaces to 768MB of memory. AMD is betting that developers will target a maximum memory footprint of 512MB, and it claims the reason Nvidia uses larger frame buffers on its cards is merely to compensate for the relatively odd sizes of its memory buses: In order to achieve the desired memory bandwidth, AMD says, Nvidia has to put more memory on the card.

AMD will clock the 2900 XT's core at 740MHz and its memory at 825MHz, but the company says it will encourage third-party vendors and end users to overclock both components. AMD will also bundle a coupon with the high-end SKU for free copies of Half-Life 2: Episode 2, Team Fortress 2, and Portal. AMD is launching a complete line of other desktop and mobile parts almost simultaneously, with desktop products covering price ranges from well below $100 to $400 for its best part. Check out the table for the specs on the desktop products and see MaximumPC.com for benchmark numbers.

AMD ATI RADEON HD 200 SERIES

	ATI RADEON HD 2400	ATI RADEON HD 2600	ATI RADEON HD 2900
PRICE RANGE	Sub $100	$100 to $200	$400
PROCESS TECHNOLOGY	65nm	65nm	80nm
STREAM PROCESSING UNITS	40	128	320
CORE CLOCK SPEED *	525 to 700MHz	600 to 800MHz	740MHz
MEMORY *	128MB DDR2 256MB DDR2 256MB GDDR3	256MB GDDR2 256MB GDDR3 256MB GDDR4	512MB GDDR3
MEMORY CLOCK SPEED *	400 to 800MHz	400MHz to 1.1GHz	825MHz
RING BUS MEMORY INTERFACE	64-bit	128-bit	512-bit
OUTPUTS	SVGA, DVI, VO	Dual DVI, VO	Dual DVI, VIVO

** Varies according to SKU*

Velocity Micro Buys Overdrive PC

Why shouldn't a modest-size company benefit from a boutique shop, just like the big boys?

In a move that echoes Dell's acquisition of Alienware and HP's purchase of Voodoo, semi-boutique PC maker Velocity Micro is looking to up its street cred by buying Overdrive PC.

Velocity Micro has always catered to the top end of the mainstream market, but its acquisition of boutique seller Overdrive should give both brands a better shot at high-end enthusiasts. Overdrive PC will continue to function as a separate unit, but its staff will relocate to Velocity Micro's headquarters.

Overdrive PC is less well known than ultra-high-end vendors Falcon Northwest and Voodoo, but its reputation has been skyrocketing. Velocity Micro no doubt hopes to capitalize on Overdrive's "Hyperclocking" technology, a method for producing fast yet reliable overclocked PCs.

While it might seem to be a growing trend, there are few boutiques out there left to be purchased—we just wonder who's next.

Overdrive's Core2.GX2 won our $2,500 gaming rig roundup in December 2006.

Up, Up, and Online

"If you can't beat 'em, join 'em" is the resounding message coming from the TV networks these days as they shift their online efforts from their own websites to portals that have more resonance with webizens. In the case of the NBC/News Corp. venture announced in April, that means featuring broadcast content on MSN, Yahoo, MySpace, and other sites.

For CBS, which just recently announced its own web strategy, it means partnering with forward-looking upstarts such as Joost, Sling, and Brightcove and emphasizing interactivity. The P2P Internet TV site Joost (still in beta), for instance, incorporates search, chat, and IM features into its video player; Sling's Clip + Sling site (also in beta) works with a Slingbox streaming device to allow you to record and share content with others, and Brightcove lets users edit and comment on video clips.

Let Your Web Browser Do the Walking

Opera 9.2's Speed Dial feature offers users a novel way to access their favorite site

In the latest version of Opera's free browser, a new tab launches a thumbnail grid of nine websites that you've either chosen from your existing favorites or entered manually.

TOM **HALFHILL**

Being Smart about **Vista**

How can you turn a big, fast computer into a small, slow computer? Upgrade Windows!

Unfortunately, there's always a dark side to upgrading. Code bloat in each new version of Windows erodes our precious RAM and hard-disk space. I still have my Windows 1.0 install disks: two 5.25-inch floppies. Each disk holds 360KB, so the whole installer is less than one megabyte. Nowadays, one megabyte isn't enough for the splash screen.

But never mind that I'm a pack rat. My point is to assure you that it's OK not to upgrade to Windows Vista—not immediately, at least. Although long-term resistance to Vista is futile, there are good reasons to wait a while. Your status as a power user need not be threatened. Real power users aren't reckless lemmings. Only insecure users succumb to peer pressure and marketing hype by robotically upgrading their systems with the latest of everything. Real power users know when to upgrade.

Corporations know, too. They usually wait at least a year after a new version of Windows is released before updating, by which time Microsoft has released Service Hack 1. That's the collection of patches that fixes the worst bugs, security holes, and shortcomings. Plus, delaying adoption gives the IT folks enough time to test the new OS with all their apps and upgrade the creakiest PCs in the company.

My day job is at a 38,000-employee international corporation that only last year began broadly upgrading from Windows 2000 to Windows XP. No joke. When I sent my company-loaner laptop to the IT department for repair, it came back with XP Pro—but still with only 128MB of RAM. Now it takes 10 minutes to boot, and it runs like a drunken slug.

Maybe you crave Vista for its allegedly tighter security, airhead user interface, or DirectSeX-10 graphics. Whatever. That's fine for your primary power machine. But most people these days have one or more older machines, too. Maybe your previous PC is now a media server, backup system, or hand-me-down to someone. You have my permission to keep running XP, Windows 2000, or even (in extreme cases) Windows 98. I promise that *Maximum PC* won't cancel your subscription.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

GAME THEORY

THOMAS **MCDONALD**

Bad Dad?

Every once in a while, when my kids spend a couple hours parked in front of the computer, I get the guilts. This is often assuaged by hearing about a parent who lets their kid spend four hours a day plugged into Gears of War. Hey, I may suck as a father, but at least I'm not as bad as that guy.

But the little bit o' guilt still tickles the back of my conscience, and I want to squash that sucker flat. Because you know what? It isn't so bad for children to be plugged in a few hours a week. Parents are conditioned to think that this time is some yawning vortex of sucking evil that is slowly leeching our children of their very souls! Rather, we should all gather round and play state capitol bingo or work on our compost heaps or compose haiku in honor of Basho's birthday.

Bull. My kids have only been enriched by the time they spend on the computer. That's because we manage time (it's limited and my kids rarely use the computer on school nights) and content (largely benign or at least non-graphic) and because computers open a rich and amazingly diverse interactive environment. Sure, a lot of what my kids play is educational, and that comes with its own benefits. SpongeBob is a far better (and surprisingly more patient) typing instructor than I would be, and Ms. Frizzle knows infinitely more about bugs than I ever, ever want to know.

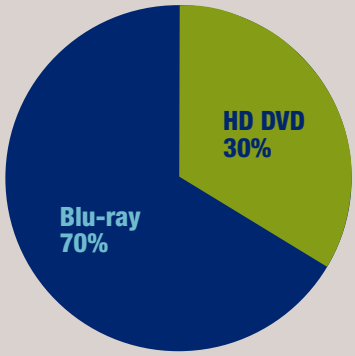
But even titles like Battle for Middle-earth II or Stronghold: Legends or Medieval II deliver endless riches. My son has become quite the expert on tactics, fortifications, and balanced force deployments, not to mention well marinated in the beloved world of Tolkien and the intricacies of Crusader politics. We can have intelligent discussions about the proper use of light and heavy infantry and the relative merits of trebuchets, ballista, catapults, and other arcane items of medieval warfare.

And dammit, that's the kind of thing that makes a boy a boy and a man a man. My boy will almost certainly never need to know the capitol of Oregon, but knowing how to properly deploy a trebuchet just might come in handy some day.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Blu-ray Puts the Heat on HD DVD

According to* Home Media Magazine, *first-quarter sales of high-definition movie discs favored the Blu-ray format by a wide margin. Of the 1.2 million discs sold between January 1 and March 31, 832,530 have been Blu-ray units. It's too early, however, to say the figures reflect a definitive preference; the numbers could stem from the relative strength of the titles in each camp's release slates for that period.



Q1 sales of HD movies.

Vista Not a Shoo-In

The OS meets resistance in its bid for dominance

Back in January, all the major computer makers jumped aboard the Vista bandwagon and began offering the OS exclusively on their consumer PCs. And why not? Microsoft's long-awaited follow-up to XP was touted as the best OS ever—it was assumed everyone would want it.

Apparently, that hasn't been the case. PC sales following Vista's launch have fallen short of expectations. According to an analyst at research firm Gartner, "While Vista includes a number of interesting features, these features just don't have enough 'must have' appeal… to spark a significant rush of new PC sales." But the news for Vista is actually worse than a slow adoption rate. Some consumers are actually asking that their new machines be outfitted with XP.

Responding to a flood of requests on its IdeaStorm website, Dell has resumed bundling Windows XP with four of its Inspiron laptops and two Dimension desktop models. Of course, it's only a matter of time before consumers have no choice. Microsoft has said it will cease selling XP to large computer makers come January 2008.

A TRIP-py Trillion

A new computer processor design looks to take systems by storm

A trillion calculations per second. That's what researchers at the University of Texas in Austin are promising will happen by 2012, thanks to their new TRIPS computer processor. Short for Tera-op, Reliable, Intelligently adaptive Processing System, TRIPS stands out from traditional CPU design in its ability to simultaneously issue 16 operations per cycle and 1,024 instructions in flight. By contrast, a "modern" processor caps out at around four operations per cycle.

The TRIPS processor operates under the EDGE (Explicit Data Graph Execution) architecture. Researchers hope the new architecture will become a successful alternative to multicore parallelism, as the former focuses on increasing the efficiency of single processors rather than simply expanding the number of cores on a single chip.

Despite being new silicon, the GeForce Ultra lacks the second-gen PureVideo HD engine Nvidia packs into the far-cheaper 8600 GTS.

Nvidia Ups the Ante, Again

Nvidia's new GeForce 8800 Ultra sounds pretty underwhelming: While it is faster than a stock 8800 GTX—core clock speed of 612MHz, shader clocks of 1.5GHz, and 1.08GHz memory—it has the same number of stream processors (128) and the same 384-bit memory interface. The 768MB frame buffer is the same, too. And they expect $830 for this?

DisplayPort to Pack a Punch!

A revolutionary new feature could help the up-and-coming digital interface make up for lost time

Now that DisplayPort 1.1 has been ratified for use in consumer electronics products, you're probably wondering how the next-gen interface will coexist with HDMI. After all, HDMI, which can already be found in many CE devices, has been positioning itself to replace DVI in PC products by offering the bandwidth (and HDCP support, of course) necessary to carry high-def audio and video signals across a single petite connector—the very thing DisplayPort offers.

But DisplayPort's trump card could be fiber optics; at least that's the goal of a company called Luxtera, which is working to incorporate its CMOS Photonics technology into DisplayPort, thereby establishing a replacement for today's copper cables.

Fiber optics are better able to carry high-speed, high-bandwidth data than copper cables because the latter's impedance can lead to signal loss.

Vonage Scrambles under the Legal Guillotine

The ongoing litigation between Verizon and Vonage is a lot like that scene in *Return of the Jedi* when Yoda dies—it just keeps going and going, and right when you think it's done, blammo, another twist.

A federal appeals court is currently keeping the VoIP provider alive, which should come as a brief sigh of relief for the embattled Vonage. The company was facing slow death—an injunction preventing it from signing on new customers—after it was found guilty of violating three of Verizon's VoIP-themed patents earlier this year. While Verizon requested $197 million in damages, a federal court ordered Vonage to pay $58 million and a 5.5 percent royalty per customer.

The outcome of the case will have a lasting effect on more than just Vonage. If Verizon ultimately proves successful in its patent challenge, the company could very well cast its legal net over a larger array of VoIP providers. In essence, Verizon could use the court system to give itself a monopoly in the VoIP sector until a company is successful in creating a work-around to Verizon's holdings.

Vonage is currently appealing the decision in the United States District Court for the Eastern District of Virginia, and the process is expected to proceed unnaturally quickly for a patent case. That doesn't give Vonage much time to develop a technological work-around for Verizon's patent claims, provided it can even do so—according to earlier court documents, Vonage is in for quite an uphill climb.

FUNSIZENEWS

A KINDER, GENTLER MPAA?

Apparently, the Motion Picture Association of America (MPAA) is ready to explore an alternative to the strong-arm tactics it's traditionally used to prevent content piracy. At a recent LexisNexis conference on DRM, MPAA leader Dan Glickman said the organization is committed to developing interoperable DRM schemes that will allow consumers to play their legitimately purchased content on any device, even if it means ripping said content from a DVD.

The organization called on other industry players to join its efforts in devising an actual plan—meanwhile the MPAA continues its fight against existing ripping programs, such as RipIt4Me and the recent HD DVD crack.

DELL'S SOLID STATE OF AFFAIRS

In what's sure to become a trend, Dell is offering a solid-state drive (SSD) upgrade to buyers of its ultra-portable Latitude D420 and semi-rugged D620. For $550, a consumer can opt to swap a notebook's mechanical drive for a 32GB SanDisk SSD. An SSD is more stable (as it lacks moving parts), requires less power, and generates less noise and heat than a platter-based drive, making it ideal for portable computing.

FORBIDDEN FRUIT NO MORE

If you crave a BlackBerry's unique functionality (or require it for your work) but resent being tied to a BlackBerry handset, a solution is on the horizon. RIM (the maker of the BlackBerry) plans to release a "virtual BlackBerry" client later this year for select devices running Windows Mobile 6. The BlackBerry Application Suite will be accessible via an icon in Windows Mobile and will load with the familiar BlackBerry interface—a user can toggle between the two environments.

DirectX 10 GPU **vs.** Quad-Core CPU

Maximum PC recommends that you have both a DirectX 10 graphics card and a quad-core CPU for PC nirvana, but that goal isn't realistic for everyone—that much kit costs a ton of cash.

So what do you do when you can't afford to blow an entire paycheck to keep your rig on the bleeding edge of technology? You've got to decide which part comes first. To help you weigh the pros and cons, we've pitted the two technologies against each other.

BY GORDON **MAH UNG**

round 1 GAMING

Gamers have plenty of reasons to buy a DirectX 10 card. Even though developers tell us DirectX 9 has some life left, we've seen enough DX10 content to know we'd cry crocodile tears if we didn't have a DX10 part on the day Crytek's Crysis launches. However, this battle really isn't as cut-and-dried as you might think. Besides shooting for DX10 support, developers are also coding for quad-core processors, using different threads for physics and artificial intelligence. In fact, Valve has said that it expects a quad-core CPU to give you quite a different—and we presume better—gaming experience than a single- or even dual-core proc. Still, even the CPU fanboys here think that if you have a serviceable CPU—a good midrange dual-core processor—you should opt for a DX10 upgrade before buying a quad core if your primary interest is gaming. **WINNER: DX10 CARD**

round 2 VIDEO PLAYBACK AND ENCODING

The PC has risen to the challenge as people increasingly turn to it for video playback. GPU-enabled video playback using either Nvidia's PureVideo or AMD's Avivo can actually be better than what you get with pricey professional DVD players, and it's all thanks to the GPU. While you can view HD content with a low-end dual-core CPU, you'll still need an HDCP-enabled videocard, which all but the cheapest DX10 cards support. However, when it comes to video encoding and transcoding, it's all about the CPU. Hell, a quad core isn't enough when you're using an encoder that's truly multithreaded. **WINNER: TIE**

CPU
INTEL CORE 2 QUAD Q6600
$530, www.intel.com

round 3 APPLICATIONS

The general-purpose CPU will never be replaced when it comes to pushing Microsoft Office's fat ass up and over that hill. As applications are updated for multithreading, the quad-core processor will actually get faster but also run multiple non-multithreaded applications without taking a performance hit.

This category is all about the quad-core CPU, but there are still a couple of scenarios in which the GPU is important. Almost every major video-editing application uses the GPU for acceleration, and that isn't going to change. We're at the point now that crappy onboard graphics isn't enough for these apps. ATI's and Nvidia's stream processing technologies also represent future challenges for the CPU. But that technology won't have any measurable impact for a while, and truth be told, the quad core is more important for your video renders anyway. **WINNER: QUAD-CORE CPU**

round 4 COMPATIBILITY
This is an easy category to judge. You can take an ancient Socket 939 system or even the very first 925X PCI-E motherboard and couple that old-ass Prescott Pentium 4 with a current-generation DirectX 10 card. You can't say the same for a quad core. For Intel, you need a very modern motherboard. And although AMD will likely offer an upgrade for its AM2 platform, quad-core procs in AM2 trim aren't even on this year's schedule. If you already have a Quad FX, you probably aren't itching for a CPU upgrade just yet. **WINNER: DX10 CARD**

round 5 DEVELOPER SUPPORT
Does it make sense to make DX10 capability your number one upgrade choice when DX10 games are still six months away? Even scarier, how will today's GPUs perform when DX10 games finally come out? It's enough to make you want to pass up that graphics upgrade in favor of a new CPU. However, CPUs provide a similar story. How many desktop applications use the power of a quad core? About a half-dozen. That's more apps than DX10 has but not exactly a compelling case to spend $500 right now. **WINNER: QUAD-CORE CPU**

GPU
NVIDIA GEFORCE 8800 GTX
$560, www.nvidia.com

And the Winner Is...

No one—especially us—likes ties, but after sorting out the pluses and minuses of each technology, neither part has a compelling edge. If you are all about crunching applications—photo editing, video editing and encoding, or other CPU-heavy chores—the quad core should be your first upgrade choice. However, if you are a gamer with a respectable CPU (say any Core 2 Duo or Athlon X2 proc), the DirectX 10 card is the way to go. MPC

Our consumer advocate investigates...

✓The Web of WinFixer ✓Last.fm Keeps Launching ✓PriorityElectronics.com

Lincoln, ***watchdog of the month***

THE WINFIX IS IN

Have you ever heard of ***www.virussw.com****? I had a charge from them pop up on my bank account today. I have never heard of the company and don't know how they were able to charge my account. The website screams scam. I called the number on the site and waited to talk to someone. After being told the whole time that I would speak to a person, I could only leave a message. I am working with my bank on this but was hoping you had some info about them.*

— Michael

Michael, you did the right thing by following your instincts and contacting your bank about the questionable charges. Many people wait until it's too late to dispute fraudulent charges.

The Dog started his investigation by simply calling the company. After two minutes on hold, the Dog was transferred to a customer service rep who would not tell the Dog her name or even the name of the company she was working for. When the Dog asked her if she thought that was suspicious, she would not respond and instead transferred the Dog to "Jennifer's" voice mail. No surprise, "Jennifer" did not return the Dog's call.

A check of the domains registered to Virussw.com's IP address (66.244.254.64) turned up several other websites the Dog has written about, including WinAntivirus.com and WinFixer.com. The Dog was also able to connect Virussw.com to WinFixer by searching for Virussw.com's toll-free support number. WinAntivirusPro.com, DriverCleaner.com, ErrorSafe.com, and WinFixer, amazingly, have also used that number.

In the January 2006 issue of *Maximum PC*, the Dog warned readers away from these applications, which clearly have a checkered history and have been rated as malware. Google's Stopbadware.org. has since banned people from visiting the WinFixer 2005 and 2006 site if they find the URL via Google's search engine.

WinFixer popups have plagued not only PC users. Reports on the Internet indicate the popups that goad people into visiting WinFixer's site have also impacted Mac and Linux Firefox users.

So, who the hell is behind these terrible programs?

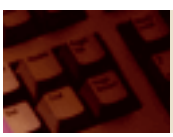
Menlo Park, CA, attorney Joseph M. Bochner thinks he may have the answer. Bochner filed a class-action suit on behalf of Beatrice Ochoa, who claims WinFixer did a number on her PC after she paid the company $30 for the program. The suit, filed in Santa Clara Superior Court, alleges that WinFixer, ErrorSafe, WinAntivirus, and WinAntispyware are "fraudware" and use messages to trick users into installing the packages on their PCs. The suit says: "These representations are fraudulent (and very often flatly false) in that Defendants have designed and intended the Fraudware to report that the host computer is infected regardless of the truth. The Fraudware then misrepresents that the victim may repair the purported problem by paying money to Defendants. Victims who comply are instructed to enter their credit card information and to transmit it over the Internet, whereupon Defendants charge the victims from $29.95 to $59.95, depending on the particular Fraudware title involved."

Search the web for Virussw.com's phone number and you'll find that many other questionable companies also use it.

Bochner has taken his suit one step beyond what others have been able to achieve by actually naming two of the defendants, Marc J. Cohen of Florida and James Reno, the president of Ohio-based ByteHosting. During his investigation of WinFixer, Bochner said he ran across an unsecured database that contained information on people who purchased the program around the world. Bochner estimates sales of WinFixer to be in excess of 2,300 a day. If the average cost were just $30 per customer, the company's yearly take would be greater than $25 million.

Bochner, however, is dismayed by the lack of interest shown by law enforcement and large companies. Symantec, Bochner said, sued Reno and ByteHosting, and the deposition in the case made it clear that the antivirus company had been pursuing WinAntivirus, which was apparently using the familiar yellow colors of Norton. Bochner said Symantec had ByteHosting in its sights, but oddly, never followed up on it.

"Symantec clearly had a chance to shut [these WinFixer] guys down," Bochner said, "but didn't for some unfathomable reason." Bochner said he has also had very little luck convincing any law enforcement agencies to take a hard look at the folks, despite the complaints. Regardless, he said the suit will continue. More information about the suit is available at http://fixwinfixer.wordpress.com. For what it's worth, the Dog was unable to get a comment from Cohen's attorney or any of the other parties named in the suit. The Dog will keep a close eye on this one and report



Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic the Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

Firing up Windows Media Player will launch Last.fm.

updates as they arrive. In the meantime, you should obviously avoid these applications like the plague.

MY LAST.FM WON'T STOP

After reading about ***www.last.fm*** *in* ***Maximum PC*** *I decided to try it. It's not bad. I figured I would run it when I wanted to hear some streaming music. When I finished listening, I clicked the icon in the task bar to exit the application. Ten minutes later it was running again. I clicked Exit and went to work. It started again. I looked at the Options menu and unchecked "Scrobbling" and made sure it wasn't set to run automatically when Windows starts up.*

After clicking Apply and exiting the application, it started up again. I could tell when it would start up because my floppy drive would make a noise. I decided to uninstall it since I have no idea what it's doing.

— Brian

To see if he could reproduce the problem, the Dog installed the latest version of Last.fm on a clean copy of Windows XP Pro running in a virtual machine. Like Brian, the Dog also unchecked "Scrobbling" and "Start with Windows."

After 18 hours, the application had not spawned. So why was Brian's version starting? Windows Media Player is the likely culprit. When installed, Last.fm hooks into Windows Media Player. If you launch WMP, Last.fm launches with it, which gives the impression that it is starting by itself. As far as the Dog knows, the app is clean, and the Dog has received no other complaints about it being too aggressive in starting up on its own.

LOW PRIORITY

I purchased a notebook PC hard drive from PriorityElectronics.com in February and ordered it second-day FedEx. Two days later, the drive didn't show up. A week later, I called Priority Electronics and spoke to a salesperson named Jessica who said an email with the package's tracking number would be sent to me at the end of the day. I didn't receive the tracking information. To make a long story short, I had to call the company several times to get a refund for my shipping costs, and I had to badger them just to get the product I paid for. I felt the reps were snarky with me as well. All I wanted was my hard drive on time.

— Charles T. La Grande III

The Dog spoke with a Priority Electronics rep who confirmed that the company had refunded Charles's shipping costs. The rep wasn't sure why the drive took so long to arrive, but he said that a delay at the warehouse was the probable reason. Although Priority did ultimately supply the drive, Charles's frustration isn't unique. Priority Electronics of Fountain Valley, CA, received an F rating from the Better Business Bureau. On its website, the BBB describes its F rating as follows: "We strongly question the company's reliability for reasons such as that they have failed to respond to complaints, their advertising is grossly misleading, they are not in compliance with the law's licensing or registration requirements, their complaints contain especially serious allegations, or the company's industry is known for its fraudulent business practices." Ouch.

The Dog must point out, however, that the BBB's rating is apparently based on 18 complaints, with eight of those ending in a full refund. To see what other people had to say, the Dog headed over to www.resellerratings.com, which compiles consumers' reviews of stores. The company has a lifetime rating of 4.38 out of 10 with fewer than 20 reviews, and the last positive review came back in December 2005. The tenor of the complaints was pretty hot. One consumer wrote, "I ordered a new laptop drive that they spec'd as DVD+RW, DVD-RW, DVD+DL, and CD-RW. The first drive I got appeared used or refurbished, didn't open when the button was pushed, and did not support DVD-RW or DVD+DL. The second drive looked new but did not support DVD+DL. RMAed a second time (and I paid for shipping), then they decided they could not provide me with a drive that met their own specs. They credited back to my credit card $20 short! I'm now working with the credit card company to get my $20 back."

Although the number of complaints against the company is relatively small, we certainly don't have much confidence in Priority Electronics. Woof. MPC

Master's Guide to Cooling

We're busting out the thermal camera to show you what's hot or not in your PC—and what you should do to fix your rig's trouble spots

BY DAVID MURPHY

Unless you're running your rig in a refrigerator, the first law of geek life reads as follows: Computers are warm. And onto that, *Maximum PC* extends the corollary that as a PC's guts get faster, temperatures will only get hotter. And hotter. And then you upgrade your rig again, and you find yourself just three degrees shy of slathering your CPU with butter and using its four cores to make a morning omelet rather than animate your Supreme Commander armies.

But while conventional wisdom might tell us that more case fans equals more cooling, that handy mantra hardly reveals the real truth about what goes on inside your case. You don't need a hurricane to chill your machine, nor do all setups benefit equally from an abundance of fans. Efficiency is every bit as important as eagerness when it comes to cooling, unless you're planning to turn your basement into a wind tunnel and restock the ice buckets every 15 minutes.

So what, then, is one to do?

Far be it from us to simply toss up the standard cooling clichés. Much as it pains us to say it, water cooling isn't a solution for most folks. And electricity costs what they are, we're not about to suggest mounting an air conditioner to the side of your rig. But we've done one better. After much pleading and promises that the oft-clumsy author of this article would be carefully supervised, our friends at Fluke set us up with a super-duper-fancy thermal-imaging camera.

In short, we pointed the camera at just about everything we could get our hands on to take full advantage of its Predator-style heat vision, but you'll be most interested in our views of three common types of rigs—an average gaming rig, an uber-enthusiast PC, and a media center machine. The thermal imager let us precisely measure the temperature of every area in these PCs. For as fun as it would be to say that fans make the red areas turn blue, we didn't want to use mere ballpark estimates to optimize the cooling on these rigs.

That means we're not only taking a look at the problematic hotspots, but also assessing the actual performance of cooling solutions across specific areas of each machine. We'd much rather reassign a fan to a place where it's needed than overcool a location that doesn't need the air. But don't let us spoil the ending. We shot before and after thermal photos of our tweaks, so you can see the differences for yourself. We also highlighted key areas that either need more work or can simply be ignored.

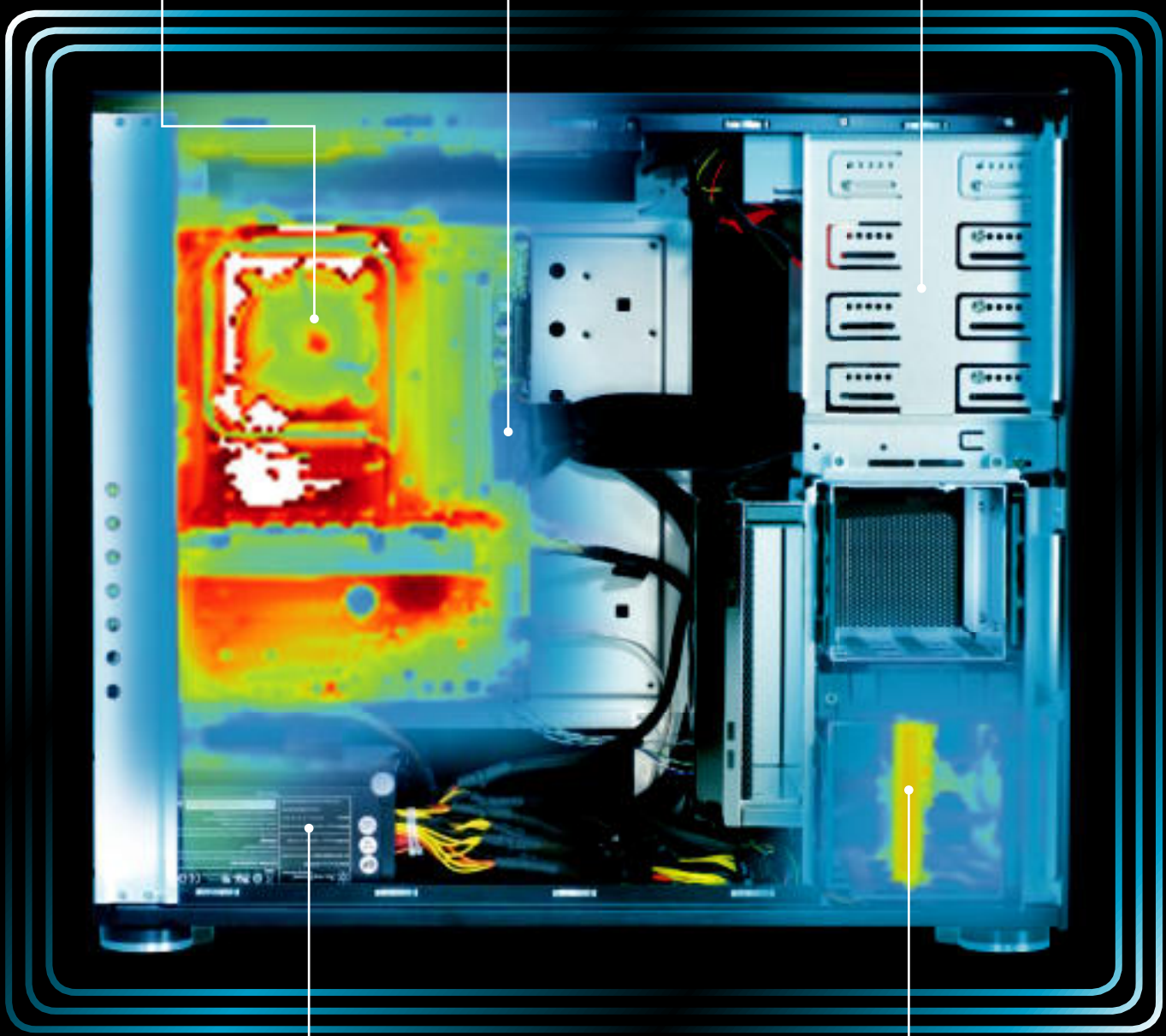
THAT'S HOT!

We used Fluke's IR FlexCam Thermal Imager to capture the heat-related images in this feature. The Ti55 records its temperature shots at a 320x240 resolution, which we then pulled into Fluke's SmartView image-editing application. This allowed us to set all the pictures to a default temperature scale for each system, ensuring that the dark purple, for instance, in one image represented an identical temperature in all other shots.

MAINTAIN THE CPU STATUS QUO
Unless you're overclocking, your stock CPU cooler should do an adequate (read: non-destructive) job of keeping your processor's temperature at stable levels. That said, it would be in your best interest to keep your chip on the blue side of the thermometer instead of the red, for longevity's sake.

MEMORIES OF SUMMER
Ahh, the ol' memory sticks. Nearly every other component in your computer has some kind of aftermarket cooling product, so why not the RAM? In short, you're gullible if you buy into the nonsense that stock-clocked RAM needs air blasting at it or additional heatsinks stuck to it. Leave the memory alone, and who the hell is Summer?

OPTICAL DRIVES ARE COOL
Here's one area of your computer that doesn't need much cooling: the 5.25-inch drive bays. Unless you have some hard drives stuffed up in here, you aren't going to find your optical drives or front-panel connectors outputting any heat. Point those fans elsewhere, son.



YOUR POWER SUPPLY SUCKS
Don't forget that your power supply works as a quasi-efficient air-sucking mechanism. We don't recommend using your PSU as the only means of air movement in your case, but it does help a little bit—just a little.

STORAGE IS HOT
This one's a no-brainer. Hard drives get warm. And while you'll see variations in temperature across the billions of different models, the usual rule is that the faster they spin and the more they're working, the warmer they get.

TEST CASE 1

THE EVERYMAN GAMING RIG

It's not the fastest box on the market, but this rig's GeForce 8800 GTX can handle anything you throw at it

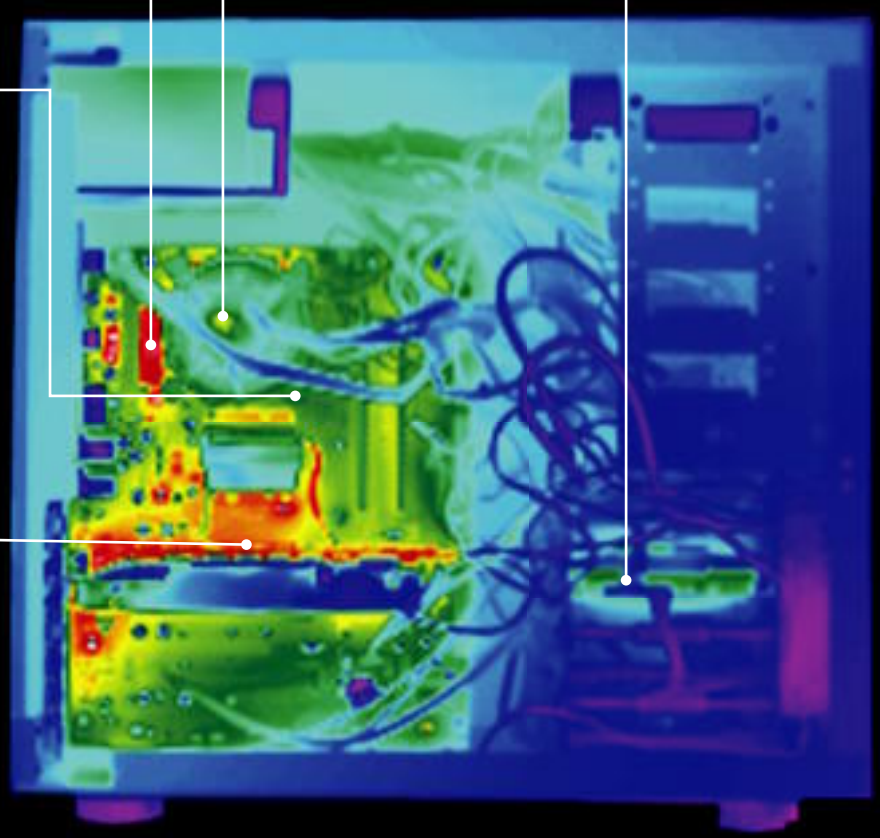
VOLCANIC VOLTAGE REGULATORS
To the left of your CPU lie the voltage regulators, a little hotbed of activity that allows the processor itself to run at varying voltages, depending on what's set in the BIOS. In our rig, these guys are running at nearly 60 C; for those of you playing at home, that's literally "hella hot." If your motherboard came with a clip-on fan for this area, you should use it.

A FROSTY PROCESS
If you didn't know your CPU needed cooling, please put this magazine down and grab the nearest fire extinguisher. Even a stock cooler can work wonders. We were pleasantly surprised to see no heat issues whatsoever stemming from our stock Intel CPU cooler. While fancier models can help you better direct the airflow in your case, you'd see a lot of red if you were just rocking a passive cooler, assuming it even worked.

HOT AND HARD... DRIVE
Even with a limited amount of air moving around its exterior, our 75GB Raptor drive isn't exactly smoking. But it's still not cool. While we can't prove that high temps will shorten a drive's life, the combination of heat and delicate spinning parts is never ideal. That said, drives don't require a massive amount of cooling, just enough to stir the air.

A DEAD ZONE?
In this case study, we removed all the built-in front and rear fans to best simulate the effect of installing a modern gaming rig into a bare-bones chassis. Without some fans to help with airflow, the warm air created by our hot components has nowhere to go, save for the power supply's conduit. There's no reason to cut new fan holes, as the case has plenty of mounts—we just need to figure out the most efficient way to use them.

8800 DEGREES
Graphics cards are guaranteed to generate a lot of heat. Our rig's 8800 GTX card is running at a steaming 60 C up top. While the card's built-in cooling system helps move heat from the GPU to the butt of your case, it doesn't dramatically affect the underside—or top—of the card. Make sure your case's back-fan is spinning; it'll help.

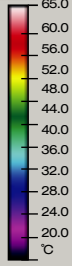


UNDER THE HOOD

CPU	3.2GHz Pentium Extreme Edition 840
MEMORY	2GB DDR2 Corsair Dominator RAM, 800MHz
VIDEOCARD	Asus EN8800 GTX
HARD DRIVE	Western Digital 75GB Raptor
COOLING	Stock CPU cooling fan
CASE	Zalman Fatal1ty FC-ZE1

SCALE

The temperature scales in all photos of this rig have been normalized to match the scale on the right.



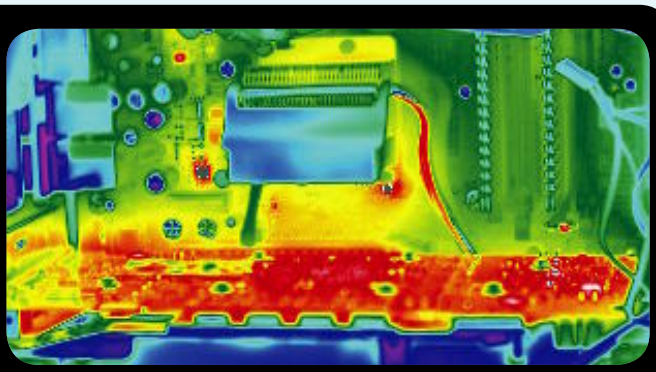
Most cases include plenty of options to accommodate sufficient cooling—having to actually cut a hole in your case is unusual. We're casting our gaze on the easiest and most efficient fixes for this Fatal1ty case: adding a water-cooling rig to help draw heat from the entire PC and lowering the general ambient temperature of the case itself.

Water cooling allows us to directly address the temperatures across a wide range of areas and should give us the best possible way to cool the monstrosity that is this rig's 8800 GTX card. But we're also going to dovetail this watery solution with a few fans. Right now, the system is running at its absolute worst, coolingwise; there are no fans pulling cold air into the case and only the power supply is pushing out air. Water cooling is a great solution, but it's not a one-shot fix.

TOSSING WATER ON THE PROBLEM

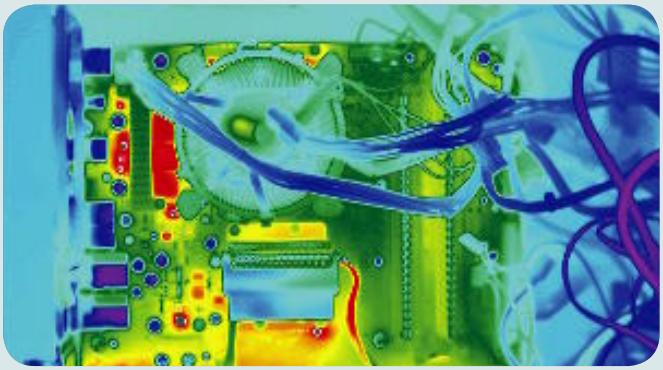
Since our 8800 GTX card's cooler is pretty efficient, we figured that slapping another aftermarket air cooler onto the card would provide little benefit, so we cracked our knuckles and installed a CoolKit SLI Elite water-cooling kit ($380, www.petrastechshop.com), which includes a pump, radiator, CPU block, reservoir, and tubing. We added a Danger Den GPU block ($135, www.dangerden.com) to our 8800 GTX and then said a prayer to the patron saint of no leaks before we fired up the rig.

We were ever so happy to see a dramatic drop in temperatures during our highly scientific "Oblivion at full power" test. Temps on top of the card dropped from 55–60 C to a pleasant 43–50 C. Less heat off the GPU helped lower the overall temperature of all the components around the 8800.



In our before shot, the entire GeForce 8800 GTX board was painfully hot.

A VERITABLE TWISTER OF COOLING



This case's poorly conceived cooling scheme was easily remedied.

Originally, the airflow in this rig was a complete disaster—shoot, there was no airflow. Sure, there was a little action around the CPU and the power supply, but as a whole, we'd hardly call that a cooling scheme. We fixed the problem by adding a stock 12cm fan to the rear of the case to suck warm air out and two 8cm fans to the front of the case to pull frosty air in. We were actually surprised to find that running the second 8cm fan up front didn't have an impact on the case's ambient temperature.

Around the cooler parts of our rig we saw drops of between 5 and 10 degrees. But because we switched to a water-cooling setup, we did see an increase in temperatures near the CPU. Our next step with this rig would be to add a dedicated fan blowing directly on the CPU area.

THE BEST OF BOTH WORLDS

Nothing beats water when it comes to cooling, save for a healthy hybrid of air and liquids. While it would be great to rely on just pumps and tubing to turn your rig into an icebox, even the most hardcore of water-cooling enthusiasts needs a few supplemental fans to cool hard-to-reach areas. It's sad but true—try as you might, you can't water-block every single warm spot in your system.

Still, you needn't go fan-crazy with a water-cooled rig. Just use enough fans to get some air moving around the hard drives and add an exhaust fan to the rear to complete the airflow circuit. Better yet, double up; make that exhaust fan the intake fan for your radiator. And it's always a good idea to tune your airflow using a software utility such as SpeedFan or a fanbus to get the best airflow-to-noise ratio.

We not only improved temperatures but also made the rig look totally sweet with a UV-reactive water-cooling setup.

TEST CASE 2 THE UBER-ENTHUSIAST RIG

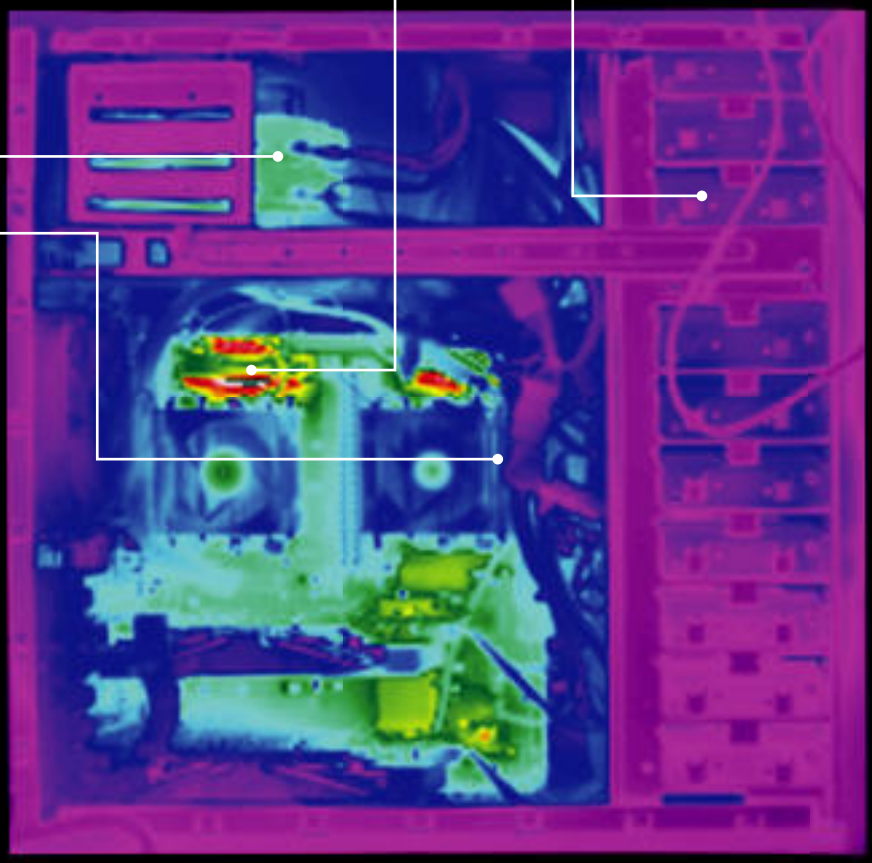
Our Quad FX machine is one hot mother… shut your mouth! Just talking about Quad FX!

SPLIT THE TWINS
Yes, we're looking at the hard drives again. It's bad enough there's no air to flow across their spicy exteriors. But in this case, there's an additional issue: The Raptors are nestled together like two bugs in a rug. Two very warm bugs in a heated, bearskin rug. With temperatures pushing 65 C, these 10,000rpm Raptors surely won't last as long as they could were they a wee bit chillier.

KEEP YOUR ARMS AND LEGS AWAY FROM THE VOLTAGE REGULATORS
As it's running a pair of dual-core procs in tandem, our Quad FX platform requires two voltage regulators. And without any kind of cooling support, these puppies get *hot*. How hot? 100 C is a conservative average, although certain areas of the regulators got hotter than 110 C—the top range of our thermal imager. It's a small wonder nobody was killed testing this rig.

IF IT AIN'T BROKE…
See this part of the case? Near our two nestled optical drives? Yeah, it's plenty cool. There's no need to buy a crazy bay fan or start drilling holes all over the place. Your case doesn't need to become an F3 vortex to achieve cooling nirvana. The Quad FX already sounds like a jet engine; there's no need to turn it into a rocket launcher.

RAM A-OK
The RAM in our Quad FX machine reached an average of 53 C or so. That's pretty warm, and it's due to a lack of additional cooling around the motherboard area. We'd prefer that area to be just a little cooler, but the temps aren't cause for alarm. We want to run just a little air across the modules—believe it or not, one of those aftermarket RAM coolers will do the trick.

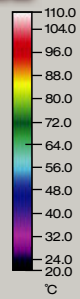


UNDER THE HOOD

CPU	3GHz Quad FX-74
MEMORY	2GB DDR2 Corsair Dominator RAM, 800MHz
VIDEOCARD	Two Nvidia GeForce 7900 GTX in SLI
HARD DRIVE	Two Western Digital 150GB Raptors
COOLING	Two AMD stock CPU coolers
CASE	Thermaltake Armor

SCALE

The temperature scales in all photos of this rig have been normalized to match the scale on the right.



Listen, Raptor drives cost a ton of money, so we'd like to keep them as pristine as possible for as long as possible. Our first plan of attack is to somehow get our hard drives to a reasonable average temperature. We're not looking to freeze up any platters but reducing the heat by 10 degrees or so would be a worthy accomplishment.

Our obvious next targets are the small supernovas—otherwise known as the voltage regulators—nestled above the Quad FX. We're concerned that a lack of air on them for very long will lead to critical issues, the least of which being a giant, roaring fire in the Maximum PC Lab. These things need to get cooled, stat; 110-plus degrees does not a happy computer make.

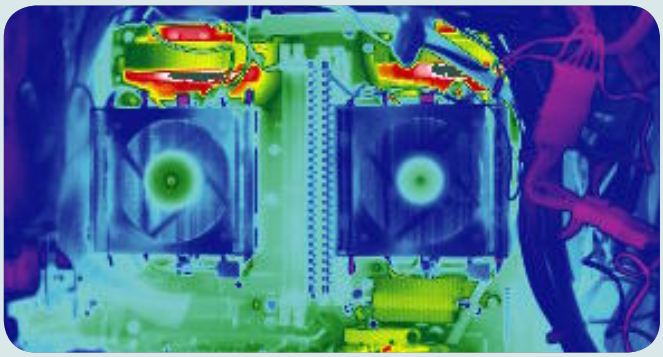
BEGONE, FOUL HEAT!

Our Quad FX machine is interestingly designed in that a 12cm fan pulls hot air from the CPU area and pushes it out of the case somewhat close to the power supply's fan. This gives us the effect of two hot-air channels emitting from the back of the case, while at the same time, a third fan covering the hard drive area sucks that warm air right back in. Strange.

To cool the drives, we start by reversing this odd airflow to let our underpowered fan also suck warm air out of the case; no sense in redistributing 30–50 C air over already warm drives. We also gave the Raptors a bit of breathing room by providing them a drive's worth of space between their toasty exteriors. And the result of our efforts was fabulous; we cooled the drives by approximately 15–20 C each, and we didn't even have to use any aftermarket parts.

Warm Raptors are angry Raptors—and as we learned from *Jurassic Park*, angry raptors are bad news.

ANYONE NEED TO MELT STEEL?



If you hear a loud booming noise, that's just the voltage regulators on our machine exploding in a horrific fury. Pay it no mind.

Alas, the only real solution we have for our Quad FX's insanely hot voltage regulators is to strap on the generic, tiny fans that come with the motherboard. While one would think that a more powerful CPU fan would be a better choice, our tests showed there was no difference between the devices. Besides, the stock fans covering our Quad FX's processors are insanely loud and, thus, insanely fast; an aftermarket CPU cooler would offer little improvement, if any.

That said, we did see quite a benefit from using the tiny fans. Not a single temperature reading near the voltage regulator area pushed past 100 C, and we shaved off nearly 20 degrees in some areas. While the voltage regulators are still stupid-hot for our tastes, even baby steps are better than fried electronics. When someone designs a water-cooling setup that nicely covers this area, we'll be the first ones in line to get it.

FANS ARE YOUR FRIENDS

Even the fastest machines with the loudest of fans can fall short in the cooling department if said fans are improperly placed. How air flows through your rig is just as important as the amount of air you push through your rig. Remember that the next time you put an intake fan near the exhaust of something extraordinarily hot.

But as we've seen, even the tiniest modification can offer massive improvements. Simply creating some additional space between hot components can make a world of difference. Similarly, any airflow you can direct on a hot spot is going to offer some improvement. Even the tiny wussy fans that you think are worthless can become awesome, if used in the right context. And we'd much rather fuss with those than try to find a louder, messier solution, like adding a ton of fans to the exterior of the case. And as fun as it can be to watch a rig's internals go nuclear, we'll pass this time around.

Considering this is a heat-generating machine, it's a wonder we were able to affect the temperatures in any capacity.

TEST CASE 3 THE MEDIA CENTER MACHINE

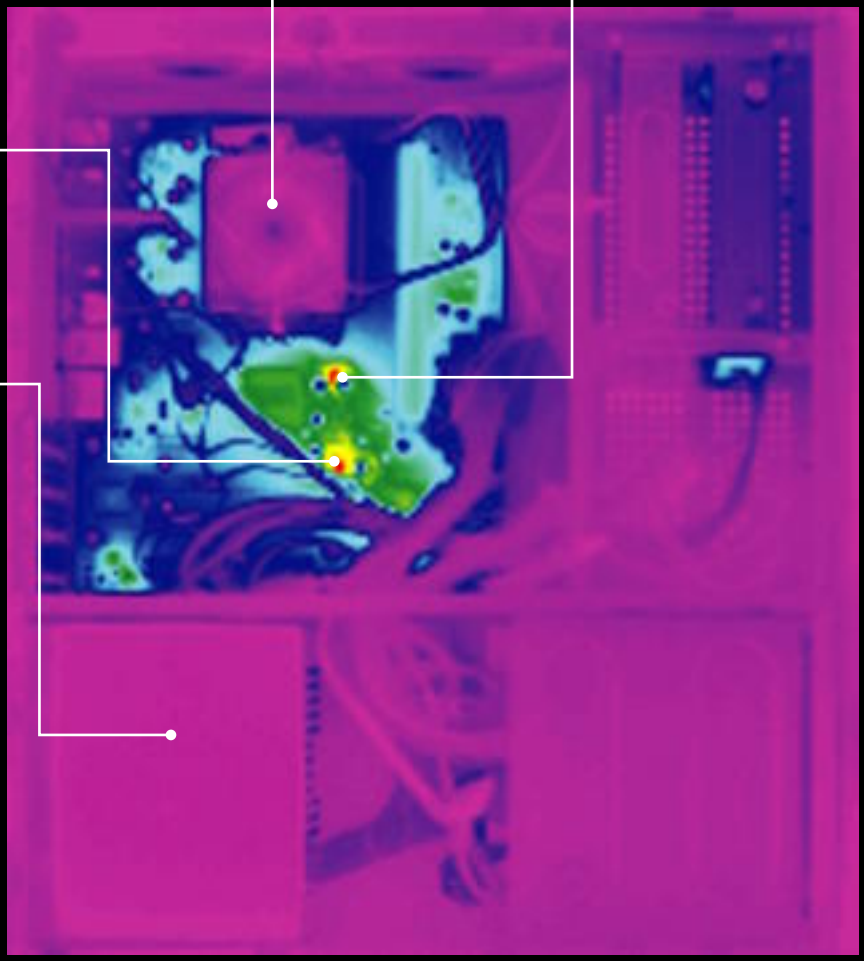
You're kidding, right? You mean we can't just attach a 22cm fan to the side of our media PC?

WHO NEEDS SPEED?
Our media center PC can't double as a high-end gaming system, and therefore, it comes as no surprise that our silent heatsink is more than able to cool the rig's 2GHz Sempron proc. Even the electronic bits around the CPU are running at just 40 C or so. We can only imagine what might happen were we to, say, strap a Zalman CNPS9700 to the processor.

WHERE'S THE VIDEOCARD?
It's nice that our media PC sports integrated graphics—that frees up space in the case and generates less heat than a discrete card. But the bare graphics chip is still one of the warmer components in the rig. And remember, using a big-ass aftermarket heatsink just won't work here; the low-profile case won't accommodate one, and anyway, most people don't want their media PCs to sound like a jet engine.

NORTH BRIDGE BAKE SALE
The area around our north bridge runs superhot in our media center case. Not only does the chipset itself hit 55 C, but it's surrounded by two smaller superhot chips that run around 70 C. With no fans to direct air around these critical parts, this area is too warm. We need to get some air across this little part, and the case's two side fans just aren't getting the job done.

POWERED AND PROBLEM FREE
It's interesting that our rig's power supply is one of the cooler areas in the case. That helps in part because we used a low-powered CPU that doesn't require a ton of juice from the PSU. Less work equals less heat, which directly affects the ambient heat levels of the lower half of the case. Our case is a mere 10 C or so above the Lab's room temperature—not bad at all!

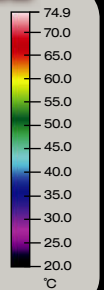


UNDER THE HOOD

CPU	2GHz AMD Sempron 3500+
MEMORY	2GB DDR2 Corsair RAM, 800MHz
VIDEOCARD	Integrated graphics, ATI Radeon X1250 GPU
HARD DRIVE	Seagate Barracuda 7200.10 750GB
COOLING	One stock CPU cooling fan, two 1.2cm fans
CASE	Antec Fusion

SCALE

The temperature scales in all photos of this rig have been normalized to match the scale on the right.



As much as we'd love to just strap a few fans into our case and call it a day, we can't—a media center PC should be as quiet as possible. Instead of digging through a ton of fans to find one that performs well and runs silently, we've come up with some clever ways to keep this rig's components chilly.

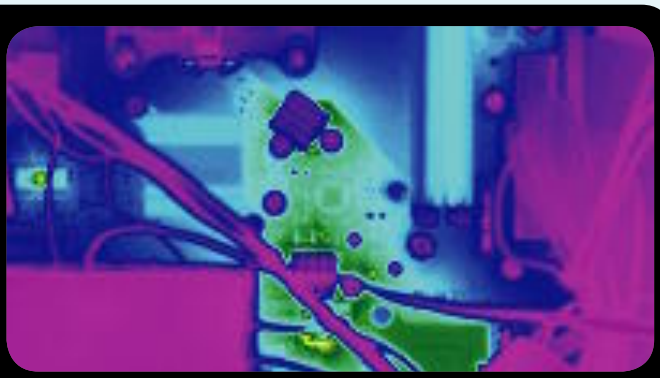
At least we're only looking at chips on the motherboard, which simplifies our situation somewhat. With the rest of the rig's parts operating at nominal temperatures, we won't have to take into account the noise created by cooling, say, a hard drive. That leaves us with a little bit of acoustic wiggle-room for the rig.

TOSSING WATER ON THE PROBLEM

For some reason, our motherboard didn't come with a heatsink for the integrated graphics chip, so we start our journey down cooling lane by salvaging a similar heatsink from a dead board and strapping it into our media PC. It ends up smoothing out the temperature of the area to a crisp 50 C, down from about 60 C.

We decided to cool the other hot chips in the case by attaching passively cooled RAMsinks commonly used for GPU memory. It's a little hoopty, but it drops the temperatures of the affected areas by 10–20 C degrees on average.

Finally, we stuff a trispeed cooler over our unused PCI slots. Since this cooler pumps air pretty much directly over the top of the north bridge, the temperature in the area dropped 11–13 C. And since we're using the fan's medium setting, we're able to strike a balance between annoying fan noise and cooling potential.



They might look a little funny, but our cooling solutions aren't meant to win a beauty pageant—just suck up the heat.

CHILLIN' YOUR CHIPS

Having cooled our media PC to the brink, we can now go back to watching DVDs in the Lab instead of wor.... [redacted]

Like making a computer case out of cardboard boxes or a coffee table out of beer bottle caps, sometimes the most efficient solution isn't the most elegant. With a drab exterior and bare-bones interior, our media PC certainly wasn't built for looks. But even the slimmest of setups generates heat, and while this rig didn't reach absurdly critical levels like our Quad FX setup, any heat reduction is a good thing.

While sticking heatsinks to chips isn't the prettiest of solutions and our PCI-style cooler leaves us with no room for add-on cards, such are the trade-offs you have to consider when building a media PC. If you want something that's quiet and cool, you'll have to make some concessions concerning what goes in your machine. But that should be the easy part; you don't need a GeForce 8800 just to watch DVDs. You don't need 30 fans either.

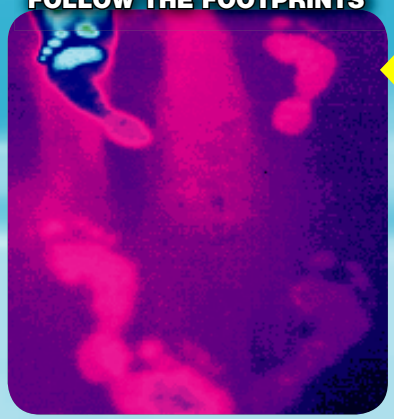
Sam Fisher Fact or Fiction

We use our thermal imager to determine whether Splinter Cell–style investigative methods work in the real world

KEYPAD TEST

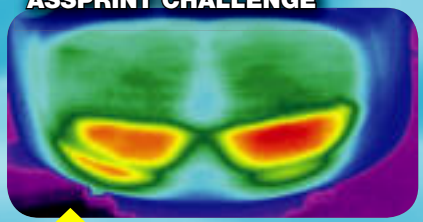
A keycode left behind by a recent visitor clearly tells us who has been in our Lab—and provides an outsider with easy entry.

FOLLOW THE FOOTPRINTS



While it's possible to detect footprints left behind by bare feet, you'll be hard-pressed to follow the trail of shoe-wearing folk.

ASSPRINT CHALLENGE



Just as every individual has a unique fingerprint, the heat signature left behind by an, er, behind—be it bare or clothed—can be very telling. The size and shape of this imprint will lead us to this chair's former occupant. MPC

ANOTHER MAXIMUM PC CHALLENGE

THIS MONTH SOFTWARE

Do Parental-Control Apps Really Keep Kids Safe?

BY THE MAXIMUM PC **STAFF**

Parents these days have a lot to worry about, particularly when it comes to their children's Internet activities. Just a little time online or even a casual glance at the news makes it woefully clear that the web is crawling with all kinds of unsavory content and characters. To counter these potentially harmful forces, many parents turn to software for custodial help. Scores of applications are now available that employ various methods to keep kids safe online, so keeping them away from inappropriate sites should be a cinch, right?

Before you return to your work worries, endless errands, or Body-for-Life support group, assured that your kids are taken care of, consider this: Most of today's youth are far more tech savvy than their parental units. Formative years spent in front of a keyboard and screen have rendered these young'uns all too at ease with a PC's inner workings. Can a little ol' app, no matter how lofty its promises, keep today's children from getting where they want to online?

To answer this question, we pitted the wits of three *Maximum PC* editors against three popular parental-control apps—Net Nanny, PC Tattletale, and Safe Eyes. Not because these editors are inherently childlike, but because it isn't far-fetched to believe a kid today would possess similar skills—or, to use the common vernacular, *skillz*. Turn the page to find out how our editors fared against their "parents."

THE TESTING METHODS

We set up the software on a fairly typical notebook running a fully updated install of Windows XP. We installed one parental-control app at a time and used the recommended settings, assuming most parents would do likewise. To ensure a level playing field, we created a Norton Ghost image of the machine with software installed to duplicate the exact same settings and conditions for each editor. Editors were allowed to take as much time as needed to breach each app's boundaries. To prove success at the most basic level, an editor had to provide screen captures of restricted content. If said content was accessed without leaving any signs of tampering, the application was considered unequivocally cracked, and thus untrustworthy as a monitoring method.

MEET THE EDITORS

THE OLD-TIMER

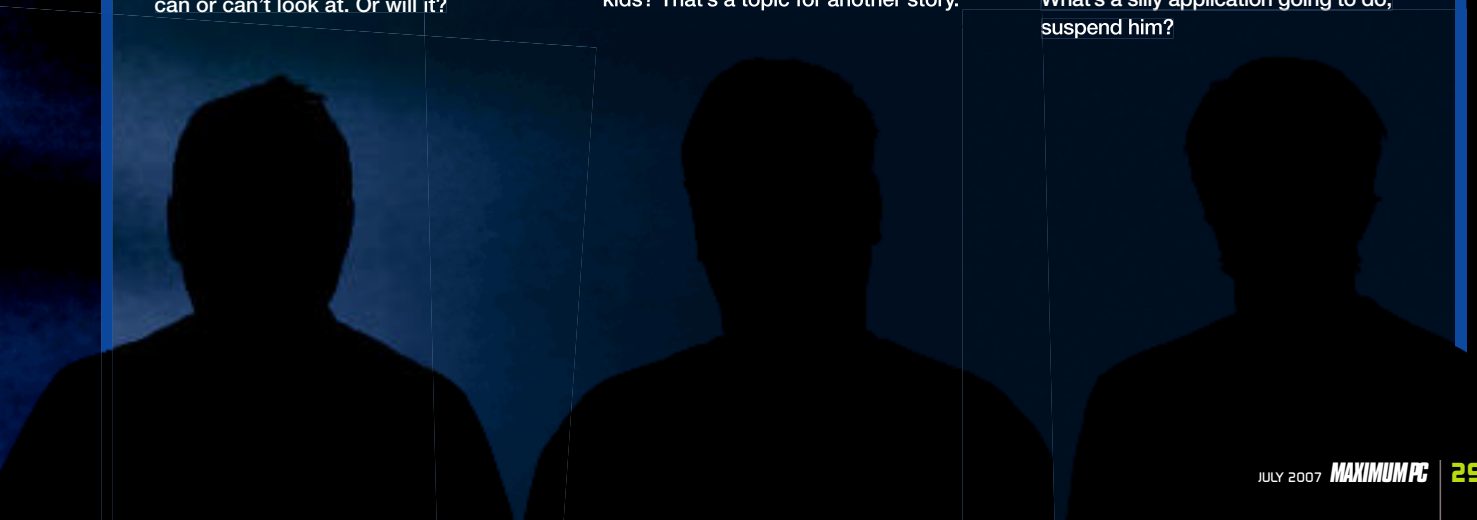
The most senior staffer in terms of computer experience, this geezer of a geek has been around the block once or twice, learned a trick or two along the way, and cultivated an enduring passion to stick it to the Man. No stinking software is gonna tell him what he can or can't look at. Or will it?

THE CRUSADER

Though he has no children himself, this editor has outspoken opinions about child rearing and firmly believes that parental-control software has no business in the mix. He's on a mission to prove that this is the wrong way to go. Will he be so adamant when he has kids? That's a topic for another story.

THE UPSTART

He's young, and that just might be his secret weapon. A whippersnapper himself, he knows how kids think and what they're capable of. Shoot, it wasn't so long ago that he was hacking into his high school's student database and having his way with every locker combo. What's a silly application going to do, suspend him?

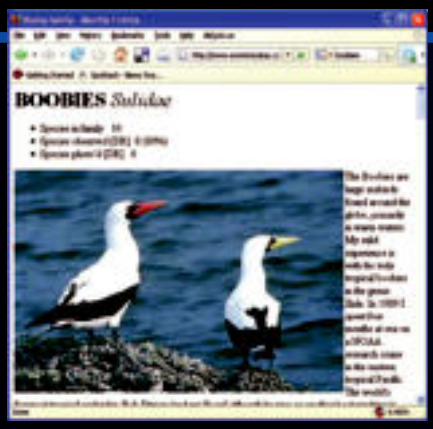


NET NANNY

Will she stand firm against the ruthless attacks of an unruly brood?

Net Nanny (**$40/yr, www.netnanny.com**) blocks all the obvious unwholesome website content by default: pornography, gambling, violence, drugs, etc.

First up against the app was the Crusader, who was so sure of Net Nanny's ineffectiveness that he predicted a two-minute turnaround time. By the 15-minute mark he had succeeded in filling the administrator's inbox with alerts of his attempts to enter My-sexylingerie.com, Moviepoopshoot.com, and other sites unspeakable. Undaunted by the ridicule of the administrator and his peers, he turned to Torpark. By downloading the browser, he was able to completely bypass the software's blocks. For many a kid, this would be enough, but should Torpark's slow surfing speed prove unsatisfactory, there's recourse: The Crusader stayed on just long enough to search for tips on disabling the software. As instructed, he killed the cwsvc.exe service and disabled cwtray.exe from running at startup; he then used an app he found on Google (LSPFix) to disable the cwalsp.dll embedded in Winsock. A quick reboot had

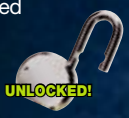


The first hour or so with Net Nanny taught one editor everything he could possibly want to know about a certain Pacific seabird.

him in the porn, with nary a mention of the violation in the app's web report.

The Upstart thought like a 14-year-old and channeled his destructive inner child. He opened the Net Nanny folder in Program Files, then fired up the Windows Registry Editor and expunged all mention of Net Nanny's executables from the registry. Following that, he deleted the Net Nanny folder itself and restarted the computer. The downside is that Windows failed to load, so he may have been too trigger-happy, since he nuked the entire OS in the process. Parents, take this as a warning to back up your data!

The Old-Timer was at the machine for no more than six minutes before he handed it back to the administrator with several naughty screen captures and an innocent-looking web report. His trick was a cunning one that would pay off big in the remaining tests: The Old-Timer explained, "As an avid reader of the many books written about Kevin Mitnick, I've learned that the social hack is far, far more powerful than any technical hack. Since our rules of engagement didn't specify that we couldn't use a USB key, I simply went to another machine (any 14-year-old on the planet has access to the Internet outside his or her domicile), visited several restricted sites, and saved my proof files to the key as well as a copy of Ardamax Keylogger Lite—a free keylogger available on the Internet…. Once the administrator checked the web report, which was, of course, clean, I waited for her to step away from the test machine, pulled up the keylogger, and jotted down her password. From there I had free rein to do what I wanted. It was that simple."



PC TATTLETALE

Can our editors stick a sock in the mouth of this software snitch?

PC Tattletale (**$50/yr for two PCs, www.pctattletale.com**) takes an entirely different approach to online monitoring. It dispenses with keywords and filters and simply records every single thing a user does on the computer—every website visited, every email sent, every keystroke entered. In other words, it's a keylogger.

Determined to redeem himself, the Upstart went first and took just 20 minutes to acquire proof of his untoward online activities yet left no evidence whatsoever in the software's log. True, the complete absence of *any* logged online activity was itself suspicious but certainly not proof of anything illicit. His method? The Upstart explains: "I used Internet Explorer to see where the administrator had been

It's one thing to create a phony log to mask naughty net surfing, but c'mon!

prior to giving me the laptop, which was PC Tattletale's website [the source of the download], and which happened to include info about what the program does, and even the Ctrl + Alt + F5 key combination one needs to access the administrative options.

"The executables were hidden in the Windows Directory in a folder called 'Explorer32.' Crafty. Since PC Tattletale keeps detailed logs of all the sites you visit and keys you press—including screenshots taken every few seconds—a simple Windows search for files created that day revealed the litany of logs. And from there, the location of the program itself was revealed!

"Having learned my lesson with Net Nanny, I let PC Tattletale do its thing. I surfed for all the porn I could get my hands on, then disabled the PC Tattletale process (to stop those damn screenshots), deleted said screenshots, nuked all the logs, and prepared to tell 'mom' I had

spent the whole day outdoors." (A highly implausible excuse, but OK.)

Relying on his social-engineering hack, the Old-Timer guessed correctly that the administrator would use the same password. (For shame!) Having learned the Ctrl + Alt + F5 sequence from his comrade—fair, since kids do talk—he found the control panel, entered the password, and was in. In his words: "I deleted all of the logs, cruised for porn, cleared my trail in IE, and decided to lay a smoke screen by browsing goody-two-shoes content—Harvard Admissions, Habitat for Humanity, etc. I manually searched for and deleted the screenshots that showed me starting up the program and typing in the password, but I found myself trapped. If I switched the program on, it would record the screenshot of the control panel—a very suspicious clue indeed, and one that would certainly have the administrator changing her password (can't have that!). I decided to leave the program in the off mode and believed that on the reboot, it would restart. Unfortunately, it didn't restart after a reboot. If it did, I could have then restarted in safe mode and deleted the last few screen grabs manually."

So, yes, the Old-Timer defeated the app, but not without a trace.

The Crusader took about 30 minutes with this one. He explains, "I found a list of offending processes using the Interweb, then killed the two renamed processes using Task Manager. Also, I built a convincing trail of sites, so the administrator wouldn't suspect I'd done anything wrong." He was unaware of the videolog, which showed his Google searches and Task Manager activity, but there was no hard evidence that he had actually tampered with the program, and the innocuous web log provided a convincing enough cover.

Porn by proxy, literally. A simple Google search revealed a web site from which to surf out of Safe Eyes's sight.

SAFE EYES

If the guys break through this app's restraints will they go blind?

With Safe Eyes (**$50/yr for three PCs, www.safeeyes.com**) you create different accounts for different users. The account the editors had access to restricted all the typical off-limits categories—adult, drugs, nudity, etc.—with a popup warning. An icon in the Windows taskbar opens a log of all activity, which can be viewed by anyone but changed only by the administrator.

Naturally, this application was a cakewalk for the Old-Timer, who used the administrator's password to surf to his heart's content and collect proof of his exploits.

The Upstart utilized the power of Google, searching for "safeeyes proxy." That pointed him in the direction of a helpful web proxy that allowed him to access illicit sites without being stopped by Safe Eyes. And since Safe Eyes leaves the Logs folder in its directory, the Upstart easily eliminated his tracks. To confuse the admin, he copied the log from the previous day over the current day's records, making it look like the program was screwing up and listing identical logs for two days. Unfortunately for him, the administrator was not fooled by the bogus log and recognized it as proof of his tampering.

The Crusader's breach was flawless: First, he browsed some innocuous sites to generate a browsing history. Then he opened the app's Logs directory—which was cleverly hidden (not!) at C:\Program Files\Internet Content Filter\logs—and write-protected it, so it wouldn't record his shenanigans. At the same time, he configured the firewall to block outbound packets from the Safe Eyes app, which would prevent it from sending emails to the administrator, which might encourage closer scrutiny.

After testing Safe Eyes's boundaries and discovering that it relied on a Winsock plugin, the Crusader tried to download the LSPfix utility but was foiled by Safe Eyes. It took another two minutes to find an unblocked mirror, and the app was disabled momentarily. By disabling the autostart for SafeEyes, the Crusader was able to reboot and surf unrestrained by filters.

But what happened when the admin returned? All that needed to be done was restart the Safe Eyes executable, which kindly repaired all the damage done by the Crusader's escapades, without a hint that the app had been disabled for hours.

In all fairness to Safe Eyes, you can opt for the log to be kept online, as opposed to in the Program Files, but the latter was the default option.

WHAT WE LEARNED

In the end, our experiment taught us several lessons. The Old-Timer certainly knows how to stick it to the Man, who in this case was the test administrator. The Crusader proved his point that parental-control software is no substitute for personally participating in your child's Internet activity. And the Upstart proved he hasn't lost much of his edge since joining the workforce.

We also learned that there are multiple ways around these so-called safeguards, especially when the apps don't encourage parents to create limited user accounts for their children. All it takes is a little ingenuity and a steadfast spirit to outsmart a piece of software (and the person who installed it). So while our tests might have exposed ways to make the applications either more effective or better at detecting tampering, there are likely to be ways around even those measures, so you really shouldn't rely on a piece of software to keep your kids safe online. To see how Vista's OS-based parental controls change the equation, see page 64. MPC

SMART PHONE

STATE OF THE UNION

Calling mom and playing Q*Bert just doesn't cut it anymore. Here's everything you need to know to get the brightest phone on the block

BY TOM EDWARDS

The state of the smartphone union is strong—so strong, in fact, that the dizzying array of service plans, operating systems, and phone features available can make choosing a device more challenging than building out a full-blown rig. Sure, you could get by with the freebie phone your service provider gives you when you sign a two-year contract—and be ridiculed and eventually shunned by your power-user friends so your minutes sit, piling up, unneeded. Lucky for you, it's easy to avoid this cruel fate!

Today, even low-end phones sport cameras and email functionality—features that were unheard of just a few years ago. What, then, makes something a smartphone? For our purposes, a smartphone is a device that can sync to your PC and download and install a rich variety of third-party apps. Some of the phones in our roundup stretch this definition, but we wanted to show you an array of options.

We contacted service providers and handset makers to collect 12 phones that represent the major carriers—plus one upstart—and the major OSes. We tested sound quality from different locations (calling people from areas of both good and poor signal strength), tried out email and messaging capabilities, and considered ease of use and ergonomics. In the end, we found some phones that we really liked, but the features we went ga-ga for might not be the same ones that will float your boat. The best phone really depends on your individual usage habits.

BUYERS GUIDE

A smartphone can cost as much as a decent gaming rig; before you drop that kind of cash, consider these key factors

SCREEN SIZE

We've always been proponents of expansive screen real estate on our desktops—and we feel the same way about our phones. Of course, a bigger screen makes for a bigger package, so you'll need to weigh size against portability concerns. If you'll be editing documents on your phone, you'll want to get the biggest screen you can find. If you'll primarily be messaging, you can forgo the larger screen and get a device that's more pocket friendly.

OPERATING SYSTEM

The OS you choose will determine the quantity and quality of apps available for your phone. While there are dozens of competing operating systems, we've narrowed our selections to the four major ones. Windows Mobile offers an interface you already know—for better or worse—as well as Outlook (and tight Exchange integration), MS Office apps, and Media Player. The newly released version 6 includes VoIP support. Symbian, the most popular mobile OS worldwide, is co-owned by leading handset-makers, Nokia, Samsung, Ericsson, Sony Ericsson, and Siemens; however, the actual interface differs from phone to phone. If ease of use is your main criteria, Palm's OS provides the best out-of-the-box experience. Palm is switching to a Linux-based OS later this year, so expect to see some changes soon. BlackBerry leads the way in terms of email and messaging, but often at the expense of other features. And if you prefer a touch-screen interface, BlackBerry can't help you.

NETWORK TECHNOLOGY

You have two items to consider in this category: voice and data. The provider you choose will determine the network technology available to you. Sprint and Verizon use CDMA, which is the dominant system in the United States. Cingular and T-Mobile use GSM, which is widely used in the United States, but the de facto standard in much of the rest of the world. However, because American networks operate on different frequencies from the rest of the world, you'll need to have a quad-band phone (sometimes called a world phone) for international calls. Dual GSM/CDMA phones are also available but are a more expensive option. Alas, the choice is not that simple, as you must also consider data transmission, which turns everything upside-down. Sprint and Verizon have the strongest high-speed data networks, using EV-DO; Cingular is catching up and T-Mobile is just getting started building a high-speed data network.

INTERFACE

You basically have two choices: touch screen or keypad/scroll wheel. Most Windows Mobile phones come with a touch-screen interface, but Windows Mobile for Smartphone–powered devices lack this capability. BlackBerry's offerings use a keypad and scroll wheel or trackball interface. Additionally, you'll want to consider whether you need a full QWERTY keyboard. If you'll be editing docs or writing long emails, a full keyboard—the larger the keys the better—is a must. We prefer devices that can be used with one hand. If you'll mainly be banging out short IMs, a smaller keyboard with a predictive text system such as T9 or SureType is good enough to get the job done.

AUDIO + VIDEO

If you're using your smartphone mostly for work, you can probably do without a camera and video playback. While these features attract a lot of attention, you should also consider whether they are good enough for you to give up your other devices. Do you really want a bunch of YouTube-quality videos? Will you ditch your MP3 player to listen to music on your phone? If not, you might eschew these features entirely—or at least not let them drive your decision-making. While integration is nice, many times the quality you get is limited—and remember, these features also drain battery life.

PROVIDER

When choosing a provider, you need to consider how you'll be using your phone. Do you need international roaming? A low-cost, unlimited data plan? The provider you choose will have the greatest effect on what phones are available to you; we recommend first choosing a provider and then selecting a phone. If your home or office is in a provider's dead zone, it doesn't matter how awesome your phone is. To get detailed information about cell reception in your area, go to CellReception.com and search for coverage by city or zip code, and then turn the page to learn more about the big four providers' service plans. Note that while we list standard activation fees and service rates, providers typically offer rebates and other specials, and phones are usually available at less than list price.

Go to CellReception.com to determine if you live in a cell-tower dead zone.

BUYERS GUIDE (CONTINUED)

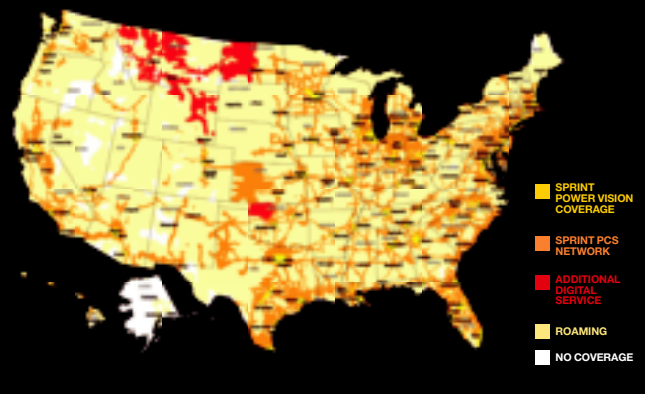
VERIZON

Our least favorite part of cell-phone contracts is the early termination fee, and while Verizon doesn't do away with it entirely, the company does make it easier to swallow. Verizon's contract termination fee starts at $175 but drops $5 per month for each full month you hold the contract. Verizon's activation fee is $35.

Verizon operates on a CDMA network, so unless you purchase a combined GSM/CDMA phone, you'll be limited primarily to use in North America. Individual plans range from $40/month for 450 minutes to $200/month for 6,000 minutes, with unlimited usage from 9:01 p.m. to 5:59 a.m. Monday through Friday, and weekends from 12:00 a.m. Saturday until 11:59 p.m. Sunday. International roaming rates start at 69 cents a minute. Two data plans are available: $30/month for 10MB and a $50/month unlimited plan.

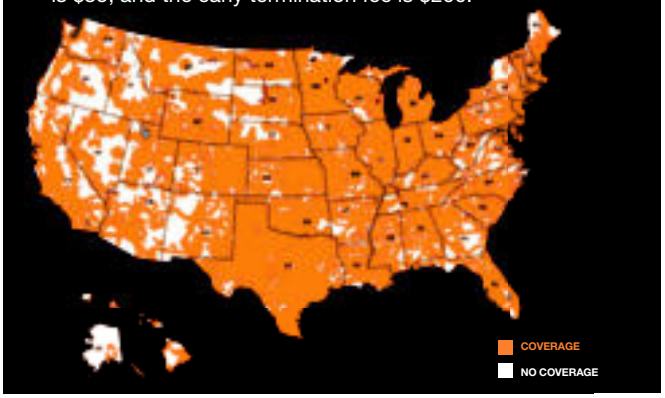
SPRINT

Sprint is far and away your best bet if your main need is a widespread high-speed data network. Although Sprint operates on the internationally unfriendly CDMA network, it is rolling out its EV-DO data network quickly and has the best overall coverage nationwide. Individual plans begin at $40/month for 450 minutes; a 2,000-minute plan costs $100/month. Sprint's nights begin at 6:00, 7:00, or 9:00 p.m., depending on the plan selected; roaming rates begin at 65 cents a minute. The activation fee is $36, and the early termination fee is $200. For data, a 40MB plan costs $40/month, while an unlimited plan is available for $60/month.



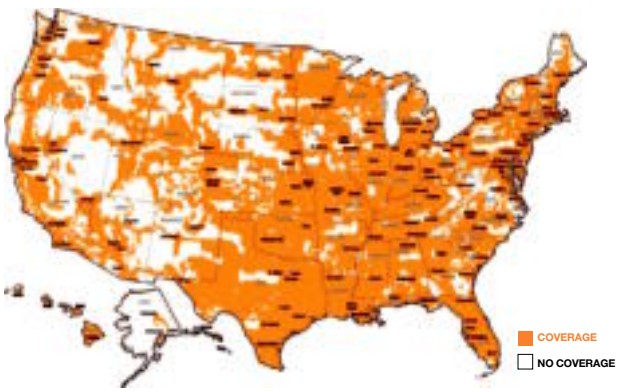
T-MOBILE

T-Mobile operates on a GSM network, which makes it a good choice if you travel to Europe often; however, the company's domestic coverage lags behind the other providers'. T-Mobile is also just beginning to construct a high-speed data network, so for the time being, expect slow downloads and web surfing. Voice plans range from $30/month for 300 minutes to $130/month for 5,000 minutes. The myFaves plan, which includes unlimited calls to five people on any network, starts at $40/month for 300 minutes. T-Mobile's unlimited data plan is $50/month. Night rates are from 9 p.m. to 6:59 a.m.; weekends are from midnight Friday to midnight Sunday. T-Mobile's activation fee is $35, and the early termination fee is $200.



CINGULAR

Cingular is increasing its 3G data network, but if you're not in a major metropolitan area, you'll have to wait to see the benefits of this rollout. Cingular's voice plans are similar to the other providers', but the company bests its competitors in terms of data plans. Smartphone data plans begin at $10 for 5MB of data, and the unlimited data plan is $20. For voice, plans range from $40/month for 450 minutes to $200 for 6,000 minutes. Unused minutes can be used in following months. Cingular's activation fee is $36 and there is an early termination fee of $175. Night rates run from 9:00 p.m. to 6:00 a.m, and weekends are from 9:00 p.m. Friday to 6:00 a.m. Monday.



SHOP SMART

Don't get stuck with a dunce. Our reviews of 12 popular handsets will help you choose a phone that fits your needs

VERIZON XV6700

One of the first phones we received for this story, the XV6700 initially won our hearts, but as more fully featured devices came our way, our love proved a bit fickle. For a phone this size, we'd prefer a camera that's better than 1.3MP. And frankly, the external antenna makes toting the phone in your pocket uncomfortable. And while the XV6700 has a large, bright screen and a responsive keyboard, it suffers from a layout that makes it easy to engage the caps lock (like Cingular's 8525). There's nothing wrong, however, with the phone's option of switching from portrait to landscape view, which makes reading web pages and documents much easier.

If you're often on the road and tend to forget your charger, this is the phone for you; this handset is a workhorse, easily surpassing its advertised standby time of eight days. At $200 less than Cingular's 8525, it's a good option for those who don't want to break the bank on a phone.

VERDICT **8**
$400, www.verizonwireless.com
PROVIDER: VERIZON

The object of our first, albeit fleeting, love.

BLACKBERRY PEARL

This tiny phone does what BlackBerrys typically do well—messaging and email—but it also kicks in some new multimedia features. Messaging is available via BlackBerry's proprietary system or third-party services, and the device supports BlackBerry email services as well as POP3 and IMAP accounts.

Audio and video playback are now available (though on the tiny screen, video isn't much of a feature), and while you won't be getting rid of your digital camera, the addition of a 1.3MP camera—a first for a BlackBerry device—is a nice touch. We even like the condensed keyboard, which places two letters on each key and utilizes the SureType predictive text system, instead of the more common T9 setup. Still, without a keyboard, the Pearl is suited for quick text messages rather than extensive emails, and while the 2.5-inch screen is bright, at that size, it's really best just for browsing headlines. What's more, the Pearl's unique glowing trackball, which replaces the typical click-wheel, was a bit too jittery for our liking.

The Pearl is BlackBerry's first attempt to include multimedia functions in its handsets.

VERDICT **7**
$400, www.blackberrypearl.com
PROVIDERS: T-MOBILE, CINGULAR

BLACKBERRY 8700g

Like the 8703e reviewed on the next page, the BlackBerry 8700g lacks many of the features people have come to expect from a smartphone—multimedia playback and a camera, to name a few. But this device focuses on the BlackBerry's core strength—email—and in that area it shines. This handset offers a few bonuses that place it a notch above its Sprint-branded brother. Being designed for T-Mobile's network means international roaming is a possibility. Additionally, the 8700g sports just a bit more battery life—about a half hour more talk time—not a huge amount, but when you're down to the dregs of your battery, every minute counts.

This device serves a particular niche; while you can link up to 10 POP3 email accounts to the device, unless your company utilizes BlackBerry Enterprise Server as a means of synching your work-based email to the device, there are better options for you. As a device to keep you connected to work, it's a solid choice, if not particularly exciting.

VERDICT **7**
$400, www.blackberry.com
PROVIDER: T-MOBILE

The phone for folks who can't be trusted with a camera.

SAMSUNG HELIO HEAT

Perhaps we're slowly turning into Grandpa Simpson, but the Heat initially left us feeling alone and confused. Simply making a call was unintuitive and working through the unclear menu with the unresponsive electrostatic touchpad had us on the verge of dropping the device from our roundup entirely. But we slowly warmed up to what had at one time irritated us. We became addicted to the H.O.T. feature, which streamed headlines from SI.com and other websites to our handset. We're also intrigued by the Buddy Beacon feature, which allows friends to see where you are (and vice versa) via the phone's GPS. Still, this handset lacks a solid feel and has an almost disposable quality to it. And while we enjoyed some of its features, the Heat seems like more of a toy than a smartphone.

Helio doesn't own its own towers but instead leases network space from Sprint. Its All-In memberships include unlimited data and run from $65 for 500 minutes of talk time to $135 for 2,500 minutes.

The Heat is, most certainly, not on.

VERDICT
$285, www.helio.com
PROVIDER: HELIO
6

CINGULAR PALM 750

The quad-band 750 improves upon its predecessor the Palm 700 with a sleeker design that's free of an external antenna, but like that earlier model, the 750 features the Windows Mobile Pocket PC OS. And in our opinion, if you want a Windows Mobile phone, there are better choices.

If you've got to have a Palm with the Windows OS, the 750 does have a few things going for it: The Palm formfactor makes the device easy to use with one hand, and the 1.3MP camera takes acceptable images. Since the device runs Windows Mobile 5, you can also view and edit Office docs; however, you'll be doing so on a dull, 240x240 screen, which was a deal-breaker for us.

Not the best choice for a Windows Mobile device.

VERDICT
$400, www.palm.com
PROVIDER: CINGULAR
6

CINGULAR 3125

We love this dual-screen flip-phone's design and rugged build, in particular the metallic keypad and the ridged exterior, which makes it easy to hold. When closed, a screen on the front can display a variety of information, such as the time and battery power, or track information for audio files. We also like that forward, back, play, and pause functions are available without opening the phone. The interior screen is bright and its 240x320 resolution is higher than the Palm 750's. As with other phones that run the Windows Mobile Smartphone OS, you can view, but not edit, docs. The 1.3MP camera and video recorder also took reasonably good images in our tests. With so much going for it, we found the lack of 3G to be a disappointment, though.

This tiny but rugged flip-phone won our durability award.

VERDICT
$350, www.cingular.com
PROVIDER: CINGULAR
7

BLACKBERRY 8703e

Lacking a camera and multimedia playback, the 8703e is pretty bare-bones for a smartphone—if you want a device that will keep you focused on work, this phone is for you. And although it lacks any frills, this handset does excel at messaging, via either BlackBerry's proprietary app or third-party clients.

It's a bit chunky and the all-plastic body won't win any design awards, but its size does allow for a spacious, responsive keyboard—the best of all we tested. And for scrolling though emails and messages, we find the trackwheel preferable to a touch screen and stylus. If multimedia playback is important, the newly released BlackBerry 8800—which is essentially a full-keyboard Pearl—might be a better bet, though, strangely, it also lacks a camera.

If all you want is email and text messaging, the 8703e will get the job done.

VERDICT
$450, www.blackberry.com
PROVIDERS: SPRINT, VERIZON
7

T-MOBILE DASH

While it doesn't have the biggest screen of all our entrants, the quad-band, Wi-Fi-enabled Windows Mobile Dash was a favorite for its slim design, solid feature set, and ease of use. The 1.3MP camera took decent pics for a smartphone, and the predictive text feature on the phone was actually useful, making typing simple.

However, the Dash has a number of limitations that will make it a poor choice for some users. You'll be able to open MS Office documents but not edit them, and data transfers will be hamstrung by T-Mobile's lack of a 3G network. We love that the device has a full QWERTY keyboard (though the keys are a bit small for our taste). These are mostly niggling irritations; the only misstep that really bothered us was the volume strip placed to the right of the screen. It was a challenge to use while speaking to someone and it was often less than responsive.

And though it may seem our complaints are piling up, the Dash was one of our favorite handsets—if you can live with its constraints, it's a solid choice.

VERDICT
$350, www.tmobile.com
PROVIDER: T-MOBILE
9

The Dash proves that slim is in.

CINGULAR PALM 680

Running the Palm OS, the Cingular Palm 680 is by far the most intuitive and user friendly of the handsets we tested. Setting up email accounts and calendars was a snap and the icons on the Home screen made finding and launching apps as simple as could be. Also a plus is a bright, responsive touch screen. The 680 improves on its predecessor, the Palm 650, via subtraction—gone on this model is the external antenna, making the device more pocket friendly. Although it doesn't run Windows, you can still edit MS Office documents on this handset, making it a great choice for someone who often works outside the office.

Palm was late to the handset multimedia game, but the 680 includes photo, video, and MP3 capabilities, though the image quality from the VGA camera leaves much to be desired and lens placement means you will likely end up with a number of shots of your index finger. With its media weaknesses, the Treo is best-suited for folks who plan to focus on email and texting.

The 680 sports an OS simple enough for people who aren't as smart as their phones.

VERDICT
$400, www.palm.com
PROVIDER: CINGULAR
9

SAMSUNG BLACKJACK

The quad-band BlackJack is comparable to the Dash in a number of ways—it has a similar feature set and slim size and runs the Windows Mobile OS. The phone also has similar limitations regarding MS Office docs—you'll be able to view, but not edit, them. We prefer the Dash's slightly larger screen and metal trim to the all-plastic BlackJack, but if you are tied to Cingular's service and interested in a small formfactor handset, the BlackJack is a good choice.

Email is available via three different systems: Good Technology allows for real-time, push e-mail; Xpress Mail provides wireless access to email, your calendar, and contacts; and Microsoft's Direct Push is an option for corporate customers who use Exchange. Messaging is available through AOL, MSN, and Yahoo. Multimedia playback and recording are strong—the BlackJack's camera has a number of shooting modes for video and still images. On the downside, the BlackJack took longer than the other handsets to boot; however, since it operates on Cingular's 3G data network, data transfers are speedy.

VERDICT
$400, www.samsungblackjack.com
PROVIDER: CINGULAR
8

While not as rugged as the 3125, we liked the BlackJack's small formfactor and 3G data speeds.

CINGULAR 8525

Sporting a strong array of features, the quad-band Cingular 8525 is great for both work and personal use, putting it at the top of the smartphone heap. Running Windows Mobile 5, the device has a bright, responsive touch screen and a full QWERTY keyboard with large, easy-to-use keys (though it does suffer from the same caps-lock problem as Verizon's XV6700 and requires two hands to use). You'll have full access to reading and editing MS Office documents. Additionally, the device supports the HSDPA 3G protocol, so data transfers are speedy (if you live in an area with a 3G network); Wi-Fi is also supported.

The 8525 also excels as an entertainment device. Whereas most of the devices in this roundup sport 1.3MP cameras, the 8525 has a 2MP camera with a load of shooting options—more than we're ever likely to use, in fact—as well as video. As with other Cingular devices, setting up email accounts with Xpress Mail was simple. The inclusion of both a scroll wheel and nav button makes working through menus a snap when it is inconvenient to use the stylus.

At a little more than six ounces, the device is a bit bulky, but still pocket-size, and a fair trade for the full keyboard and selection of features.

Your best bet for a Windows-based smartphone.

VERDICT **9**

$600, www.cingular.com
PROVIDER: CINGULAR

MAXIMUM PC KICKASS

NOKIA N95

The king of all media.

Any discussion of Nokia's N95 has to start with its $750 price—for that kind of cash, you could get a 33-year subscription to *Maximum PC*! The N95 comes unlocked, so if you don't have one already, you'll also have to buy a SIM card from either Cingular or T-Mobile. But if you want a phone packed with multimedia features, the N95 is it.

With N95's 5MP camera you can leave your point-and-shoot at home. It includes a flash, video, and multiple scene modes. The device is pretty sluggish between frames, but the multiple-shot function performed adequately. Media playback was strong, but since there's no 3G support, videos from YouTube were sluggish, particularly in full-screen mode; music playback—even on the tiny speakers—was solid.

The GPS took a while to set up, but it plotted our location down to the correct side of the street, and the directions it provided were spot on. Nokia charges an additional 92 bucks a year for voice directions.

Setting up a POP3 account was simple, but without a full keyboard, the N95 has limitations as a work device. If you want to stay connected to the office and edit Word docs and spreadsheets, Cingular's 8525 is a better choice, but as a multimedia device, no other handset comes close.

VERDICT **9**

$750, www.nseries.com
PROVIDERS: ANY GSM PROVIDER

Tales of the Loch Ness Motorola

Are the stories you hear about portable phones for real?

LEGEND #1: NO KEYS, NO PROBLEM

Lost your keys? No problem! Just call home and have someone press the button on your spare keyless entry device, thereby transmitting the signal through your phone to your car door. Then use your phone to call AAA, because unless you use your handset to smash through your window, the device won't open your car. Keyless entry operates on an RF signal different from those used by phones. FALSE!

LEGEND #2: SPONTANEOUS COMBUSTION

We've heard several stories of cell phones exploding while recharging. While some of these stories are apocryphal, many are indeed true. The culprit, generally, is aftermarket batteries. The number of incidents remains relatively small, but as with other devices, watch for product recalls to stay safe. TRUE!

LEGEND #3: BURN BABY BURN!

Rumors have swirled about cell phones causing gas station fires, but in truth there are no actual incidents to back this up. Granted, many handset-makers warn against using mobile devices near a gas station, but we suspect that is more an effort to prevent litigation rather than keep consumers from reenacting the opening scene of *Lethal Weapon 3*. FALSE!

LEGEND #4: HIDDEN POWER

Rumor is, if your Nokia phone is running out of juice, enter *3370# to tap into "hidden battery power." This code actually affects audio quality but does not open any hidden power. If you want to conserve power, reducing screen brightness and limiting the number of apps running will do the trick—and not make it sound like you're talking into a tin can. Anyway, everybody knows the actual code for tapping into reserve power is Up, Up, Down, Down, Left, Right, Left, Right, B, A, Start. FALSE! MPC

Intel expands its Lead!

BY GORDON MAH UNG

INTEL'S NEXT-GEN ATHLON KILLER IS JUST THE BEGINNING OF AN ALL-OUT OFFENSIVE AGAINST AMD. WE PREVIEW PENRYN AND EXAMINE INTEL'S LONG-TERM STRATEGY

This ain't your father's Intel. The old Intel would introduce a new microarchitecture and milk it for almost a decade with the most minute of tweaks every few years. When the competition would start to breathe down its neck, Intel fixed the problem with marketing and, umm, higher frequencies, more cache, and some new instructions. This strategy ended with Intel crumpled on the floor while AMD's Athlon 64 pranced about like a happy, happy pony.

Well, as they say, failure breeds victory, and Intel has indeed emerged from its trouncing as a leaner, meaner company. No longer building CPUs just for the sake of maximizing profits, the company is pushing a new strategy that seems fixed on maximizing performance *and* pain to its competition.

This month we went to Intel's headquarters for a hands-on preview of the company's follow-up to the current prize-winning Core 2 chips, as well as a look at what may very well be the Core 3.

Intel is a proud company, and from what we can tell, it's determined to never have its ass handed to it again by AMD, as happened when AMD released its Athlon, Athlon XP, and Athlon 64 CPUs. Following the Athlon 64 ass-whooping, Intel adopted what it calls a "tick-tock" philosophy—a tick amounts to a die shrink with some feature enhancements, while a tock is an entirely new microarchitecture.

For example, the first tick was the Presler Pentium D, which was mostly a core shrink from the previous NetBurst chip. The tock was the new Core microarchitecture behind the champion Core 2 chips. Intel plans to tick again late this year with the Penryn CPU, which moves from a 65nm to a 45nm process. Following that will be a tock in 2008 with the new 45nm microarchitecture code-named Nehalem.

The next tick will be a shrink to 32nm in 2009 with an improved core called Westmere. The tock will strike in 2010 with the Gesher core, which will feature yet another new microarchitecture. Get the picture?

This is a radical departure from the Pentium 4/NetBurst microarchitecture, which went from 180nm to 130nm, and from 90nm to 65nm over almost six years with very few changes. Why such a brutal schedule? We believe Intel is leveraging its ability to run multiple design teams in parallel in the hopes of wearing down AMD. It's reminiscent of the great graphics wars between ATI and Nvidia, in which both companies would hustle to release a brand-new graphics core every 18 months.

PENRYN: UP CLOSE AND PERSONAL

It may be designated as a tick, but Intel's Penryn is more than a mere die shrink. Intel has made numerous improvements to keep this CPU in the game. Many of Penryn's enhancements are aimed at increasing performance in today's applications, not those apps that won't be out for another three years—further proof that Intel has no intention of standing still.

The Penryn's design is similar to the current Core 2 Duo and Core 2 Quad. Natively, Penryn is a dual-core CPU; Intel will create quad-core versions by joining two CPUs via the front-side bus inside the CPU heat spreader. To keep communication between the two chips from bogging down, Intel will up the FSB in all Penryns from 1,066MHz to 1,333MHz. Xeon versions of the chip will also get a 1,600MHz FSB. Penryn will feature 6MB of L2 in dual-core chips and 12MB in quad cores, a 50 percent increase over the current Core 2 chips.

Intel expects performance increases with existing apps thanks to a new Fast Radix-16 divider, which will, theoretically, double division-math performance.

Media encoding, already something the current Core 2 kicks butt at, will get a boost through a "super shuffle engine," which will optimize data housekeeping operations used by SSE instructions. The super shuffle engine will let Penryn perform 128-bit shuffles in a single cycle, which will increase performance on any SSE2 or SSE3 instructions without requiring any software rewrites or even recompiles. Media encoding will get a further boost when developers adopt a new instruction set called SSE4. To the folks who don't take instruction sets seriously, Intel says that SSE4 will dedicate circuits on the CPU to typical encoding tasks, which should result in a huge performance boost in apps that use the instructions.

One other feature Intel is building into Penryn (and the upcoming mobile Centrino Pro CPUs) is Dynamic Acceleration Technology. Typically, in applications that use only one core, the second core will go into a low-power mode. With Penryn, Intel plans to leverage the second core's decreased heat output by dynamically cranking up the clocks on the first core.

Intel plans to manufacture its next-gen chips in volume later this year at clock speeds greater than 3GHz and sell them by early 2008, but there are indications that the CPU behemoth could ship faster processors earlier to pee on AMD's quad-core parade, which is scheduled for this summer.

DOC OCTOCORE: NEHALEM REVEALED

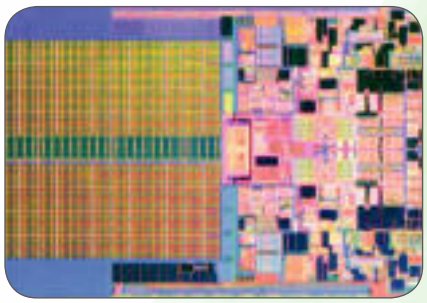
Nehalem, the CPU coming after Penryn, isn't expected until next year, but the "New Intel" is being a Chatty Cathy about

it to anyone who will pull its string.

Nehalem will be based on the same 45nm process as Penryn, but it will be significantly different from its predecessors, even going against Intel's long-held opinions about front-side-bus topology. Intel has maintained that it doesn't need an on-die memory controller like AMD's because its shared front-side bus works just fine. Indeed, the Core 2 seems to back up Intel's claims. If the Core 2 is so much faster than all the Athlon 64s, doesn't that prove that on-die memory isn't needed? Maybe so, but Intel is changing its tune with Nehalem.

Intel says an on-die memory controller makes sense with Nehalem, which won't be sharing a mere four cores on a front-side bus like the current Core 2 Quad CPUs—it will expose up to eight cores to the OS, with an additional eight virtual cores available via an improved simultaneous-multithreading design reminiscent of Hyper-Threading. Not every Nehalem CPU will sport eight cores; Intel says the CPU will be scalable, so it will be possible to construct a Nehalem-based PC with anywhere from one to eight cores.

Besides the use of an on-die memory controller, Nehalem will also feature a chip-to-chip interconnect not unlike AMD's HyperTransport links. Nehalem will also see Intel adopt yet another AMD initiative: graphics integrated into the CPU. Intel's plans, however, don't involve a GPU inhabiting the CPU die; rather, a graphics chip will be integrated into the "CPU socket"—sort of the way two Core 2 Duos are joined in today's Core 2 Quad. It's not known what Nehalem will be called, but the leap forward could be substantial enough to warrant a "Core 3" brar



A quad-core CPU in the Penryn family will pack two dual-core chips and feature 820 million transistors, 12MB of L2 cache, and a 107mm² die—which is about 25 percent smaller than today's 65nm Intel ch

PUTTING PENRYN TO THE TEST

We knew this was a new Intel when we were invited to company headquarters to benchmark two Penryn CPUs and no one confiscated our camera, searched our cavities, or irradiated us to kill any spy equipment.

Still, we weren't given free rein. Intel selected all the tests, which were run in Intel labs with Intel-built PCs and Intel-installed OSes. We weren't allowed to run any of our own tests, but we were allowed to poke around the machines all we wanted.

Normally, we pass on this kind of arrangement, as it can foster cheating or allegations of cheating. This time, however, we decided to run with it since we also plan to allow AMD the same opportunity when its quad-core Barcelona/Agena FX is available for a hands-on evaluation. So, yes, take these benchmarks with a grain of salt, but it's worth mentioning that a similar Intel demo last year of Core 2 proved honest when we had our own way with the chips.

The tests pitted a Penryn-family 3.33GHz quad-core CPU (code-named Yorkfield) against its 3.33GHz dual-core sibling (code-named Wolfdale) and the current speed champ, the 2.93GHz quad-core Core 2 Extreme QX6800. All the machines featured the same hardware, drivers, and RAM timings, running 32-bit Windows Vista Ultimate.

Several of the tests are well-known public benchmarks and apps that need no explanation: 3DMark06, MainConcept's H.264 encoder, Cinebench 9.5, and Half-Life 2: Lost Coast. Intel threw in a beta Cinebench 10 test and an alpha build of DivX 6.6 with SSE4 support using VirtualDub 1.7.1, as well.

The verdict? On the Intel-configured test rigs, Penryn looks really good. Although Yorkfield had just a 13.6 percent clock advantage over the QX6800, Penryn was 22 to 40 percent faster in most of the benchmarks. And SSE4 truly looks to be more than merely a new instruction set. Designed just for encoding, SSE4 helped the DivX encodes run 111 percent faster than on the fastest desktop CPU available today.

These benchmarks indeed show Penryn to be a formidable chip. With months left for fine-tuning, possibly even higher clock speeds at launch, and who knows what other added tricks, the upcoming battle between the new Core 2 Quad and Athlon is sure to be epic. When you factor in a Nehalem appearance next year, you can see how rough this tick-tock business is going to be. MPC

	2.93GHZ CORE 2 EXTREME QX6800	3.33GHZ CORE 2 QUAD (MODEL UNDISCLOSED)	3.33GHZ CORE 2 DUO (MODEL UNDISCLOSED)
CODE NAME	Kentsfield	Yorkfield	Wolfdale
L2 CACHE	8MB	12MB	6MB
EXECUTION CORES	4	4	2
3DMARK06 CPU	4,047	**4,944**	3,068
3DMARK06 OVERALL	11,252	**11,969**	11,020
MAINCONCEPT H.264 ENCODER (SEC)	89.0	**72.7**	119.2
CINEBENCH 9.5	10,551	**12,900**	7,061
CINEBENCH 10 BETA	1,541	**1,917**	1,125
HALF-LIFE 2 LOST COAST (FPS)	153.14	**213.03**	206.06
DIVX 6.6 WITH VIRTUALDUB 1.7.1 ALPHA (SEC)	38	**18**	22

Best scores are bolded. All tests were performed on Intel BadAxe2 975X motherboards with a modification to allow them to run Penryn CPUs, with GeForce 8800 GTX cards, 2GB of DDR2/800, a Seagate Barracuda 320GB hard drive, and onboard audio.

Expose the Details with HDR Photography

If you hate playing the ping-pong exposure game with your digital camera, learn to create images with a high dynamic range

The tabloids do an unbelievable job of exposing every detail of their target subject's image—too bad digital cameras can't do the same. Under various lighting conditions, digital cameras tend to expose their limitations when it comes to *dynamic range*—the scope of an image's shadow to highlight detail. Therefore, that sunny blue sky in your photo may look nice, but your intended Elvis-inhaling-a-Krispy-Kreme masterpiece is nothing but a silhouette—try exposing him in Photoshop and your sky turns into a white, overblown mess. Thankfully, you can do something to attain maximum exposure without turning to B-list celebrity antics. It's called high dynamic range (HDR) photography.

BY KRIS **FONG**

WHAT YOU NEED

- **DIGITAL SLR OR POINT-AND-SHOOT CAMERA WITH MANUAL CONTROLS**
- **TRIPOD**
- **ADOBE PHOTOSHOP CS2** (or later version) $650, www.adobe.com or **HDRSOFT PHOTOMATIX PRO** $100, www.hdrsoft.com (Download a trial if you don't have either app)

Tired of getting pics like this from your digital camera (left)? Employ HDR photography principles and expose every precious detail (right).

1 Define Your Composition

Our composition features high contrast, and this is how our camera captured it to properly expose the dragon and then optimally expose the lamp.

Take your camera, tripod, and butt to a favorite location that offers a good amount of shadows and bright areas, so you can truly see the merits of this technique. We recommend a dimly lit room with sunlight streaming through a window or a favorite spot to watch the sunset. Mount your camera on the tripod, set your camera's metering mode to spot metering (the icon looks like this: [•]), set the camera to capture RAW or TIFF images, set the ISO to the lowest setting (to avoid noise), and set your preferred white balance—don't use auto modes or flash. Then determine how you want to compose your frame, switch your camera to Aperture Priority mode, and set an aperture to complement your subject.

2 Gauge the Brightness

To ensure that you capture your composition's entire brightness range, you need to shoot a series of images that properly exposes its darkest and brightest elements. To gauge the darkest parts of your composition, use your camera to spot meter the darkest element—something with detail—not an area that's solid black. Focus on the area and press the shutter down halfway; your camera should display the shutter speed required for proper exposure—jot this down. For example, our camera indicated a 1/2-second shutter speed to properly expose the area behind the dragon's ear. Do the same for the brightest detailed element—not an area of total white—and jot down the displayed shutter speed; in our example, the lamp's surface requires a 1/750-second shutter speed.

Now calculate three additional shutter speeds between the two so that each is set equally apart for a total of five shutter speeds. In our example, we calculated our five shutter speeds to be 1/2, 1/189, 1/376, 1/563, and 1/750. Round to the nearest shutter speed if values fall between your camera's set speeds.

To determine the proper shutter speed to expose our darkest details, we spot-metered the area behind the dragon's ear.

3 Go Snap Happy

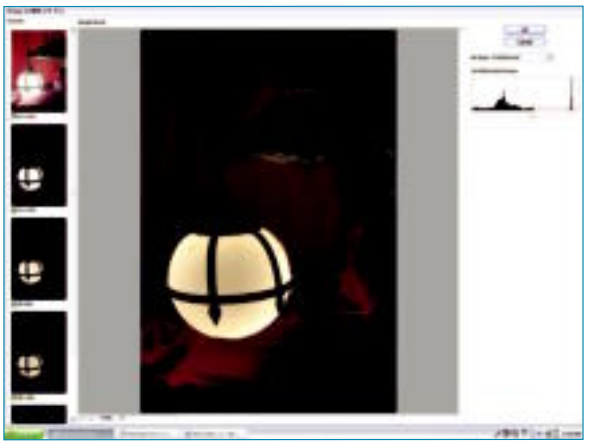
OK, let's shoot. Make sure that your camera and tripod are steady, set your camera to its Manual mode, check that your aperture setting is still the same, and set the shutter speed to the slowest speed you jotted down. Then frame your composition and snap your first shot. Without moving the camera, reset the shutter speed with the second-slowest speed and shoot again. Repeat this process with the remaining three shutter speeds, taking care not to move the camera. When you're finished, review the five images in your camera—you should see a gradual progression of exposures without any frame movement. If you detect movement, shoot again.

Our five-shot series shows a range of detail at opposing ends—from some dust on the dragon's fins down to the dirty details on the surface of the lamp.

4 Create an HDR Image

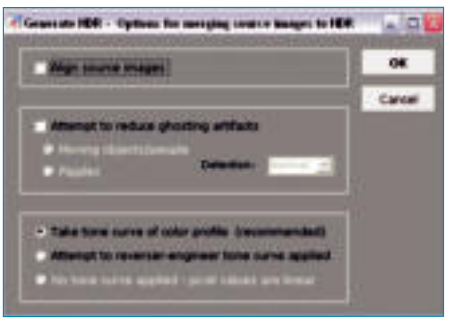
Download your images to your computer and then follow the instructions below for the app you have at hand to create an HDR image.

Photoshop Users—Choose File > Automate > Merge to HDR. In the resulting dialog, choose Files from the Use drop-down menu and then click Browse. Navigate to and select your five images in the resulting dialog, click Open, click OK to have Photoshop work its magic, and then click OK to confirm. To save your new 32-bit image, choose File > Save and then choose an HDR format from the Format drop-down menu, such as the standard Radiance HDR (.hdr) format or Industrial Light & Magic's OpenEXR (.exr) format, which is widely used in the CG and animation industry. Then click Save.



Photoshop's easy-to-use HDR merge feature quickly turned our five shots into a detail-enriched HDR image. You just can't see all of the details—yet.

Photomatix Users—Choose HDR > Generate. In the resulting dialog, select the "Load differently exposed images" option and then click Browse. Navigate to and select your five images in the resulting dialog, click Open, and then click OK. In the resulting dialog, Photomatix provides options to help improve your image; select the ones you want, then click OK to have the app blend everything together. To save your new 32-bit image, choose File > Save As and then choose an HDR format from the "Save as type" drop-down menu, such as the standard Radiance HDR (.hdr) format or Industrial Light & Magic's OpenEXR (.exr) format. Then click Save.

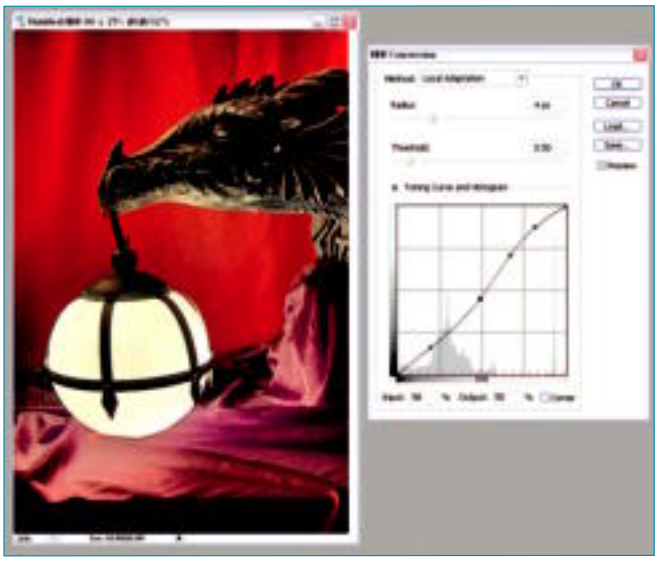


Photomatix Pro features options to improve your HDR image, including a function that can align your images to help eliminate camera shake.

5 Bring out the Details

All right, you're probably wondering, "What the f***? Why does my photo look so crappy? High dynamic resolution my ass!" Don't worry, all of the exposure information is there—your computer screen just can't display all the info due to its low dynamic range of brightness. To make your photo fit for public consumption, you need to down-convert your 32-bit HDR image into an 8- or 16-bit image for proper display and editing. In the HDR world, this is called tone mapping.

Photoshop Users—Choose Image > Mode > 16 Bits/Channel to open the HDR Conversion dialog. From the Method drop-down, choose Local Adaptation. You should see your image's brightness change dramatically. Click the "Toning Curve and Histogram" reveal button and then use the Toning Curve (along with the Radius and Threshold sliders) to fine-tune the exposure. Just click on the diagonal line (Toning Curve) to plot a point and then drag it around to see how your changes affect your image. Plot several points and shape the curve initially so that it complements the shape of the histogram (the mountain-looking graphic). Then fine-tune the curve so that your image displays an optimal amount of contrast while retaining a high degree of detail throughout. Be careful that you don't inadvertently wash out your image (low contrast) as you bring out its details. Play around until you're satisfied with the image's appearance and then click OK. Save your result as a TIFF image and then tweak it to perfection.



Photoshop's Toning Curve tool works like the Curves tool to fine-tune different levels of exposure in your image.

Photomatix Users—Choose HDR > Tone Mapping to open the Tone Mapping window, which offers a variety of contrast, color, brilliance, level, and other controls. The idea is to balance your image so that it displays an optimal amount of contrast while retaining a high degree of detail throughout. If your image needs a good amount of exposure tweaking, choose Tone Compressor from the Method drop-down menu and use the controls to tweak the brightness, contrast, and levels in your image. For fine-tuning, choose Details Enhancer from the Method drop-down menu and use the sliders to enhance the contrast, color saturation, luminosity, levels, and more. When satisfied, select either 8-bit or 16-bit under Output

Depth and click OK. Save your result as a TIFF image, which you can then tweak to perfection using an image editor. MPC

Photomatix's Tone Mapping window features a few controls to fine-tune your image.

SHOOTING SHORTCUTS

If you don't have manual controls on your camera or are feeling lazy, here are a few shortcuts to get the requisite photo exposures.

► Instead of measuring and calculating exposures, set your camera to Auto Bracket mode with a 1 EV difference between exposures (such as -2, -1, 0, +1, +2) and snap a five-frame burst. This is also a good way to capture multiple exposures of a composition that contains potential movement (such as the ocean or people).

► Don't have manual controls? Shoot your composition in program mode at 0 EV; next, alter the exposure compensation up and then down the EV scale to get the other shots.

► Instead of five shots, aim for the middle shutter speed between your two measured speeds and shoot just three images.

► Forgo measurements and calculations altogether and shoot in Aperture Priority mode with matrix metering, using exposure compensation in 1 EV increments instead of shutter speeds.

Ask the Doctor

Diagnosing and curing your PC problems

D-V-IVERS

I have a Dell 19-inch LCD monitor. Will an Nvidia GeForce 6600 OC graphics card support this monitor's DVI input with the drivers on the installation CD or will I have to download another driver from the Nvidia website?

—Gene Macavey

You won't have any problems running the monitor with your bundled graphics card driver, but as a general rule, you should run the latest graphics driver available. Check Nvidia's website for the most recent version.

MIX-N-MATCH 8800S

In your May 2007 issue, you answered a question (Congrats, It's Twins) in regard to matching SLI cards. You said that as long as the GPUs match there's no problem. Does that mean I can run an 8800 GTX with my 8800 GTS? Or does the difference in video memory (768 versus 640) make this not possible?

—Sel Baskurt

You couldn't run an 8800 GTX and an 8800 GTS in SLI, but it's not because of the difference in memory. The GTX and the GTS are within the same family, but they're architecturally different. The 8800 GTX has 128 stream processors and 24 rasterizers, while the 8800 GTS has 96 stream processors and 20 rasterizers.

The Doctor thinks you could run an 8800 GTS with a 640MB frame buffer with an 8800 GTS with a 320MB frame buffer in SLI, but in that situation, you'd be wasting half the memory on the higher-end card because the combination will seek the lowest common denominator in terms of memory.

THESE TWO MONITORS ARE GR… <BZOOP>

I have two 7800 GTs running two NEC MultiSync LCD1760NX monitors and a Cintiq 21UX. Whenever I'm forced to restart my computer, the second NEC monitor will come on and then go black, as if in Sleep mode. If I turn the monitor back on immediately, it will stay on for a varying amount of time before going black again. I've dug through every Display Property setting and built-in monitor setting trying to correct the issue, but in the end I have to turn the monitor off for a few minutes and then turn it back on hoping it will stay on.

—Woody Hearn

Since you're describing an intermittent problem, the Doctor assumes you know that when you run both 7800 GTs in SLI, one of the two displays will go dark. This is the standard MO for SLI. Intermittent problems like this are always a bear to solve, but you might first try swapping cables. It's possible that the monitor isn't sensing that it's connected to your videocard and is therefore going into an energy-saving sleep state.

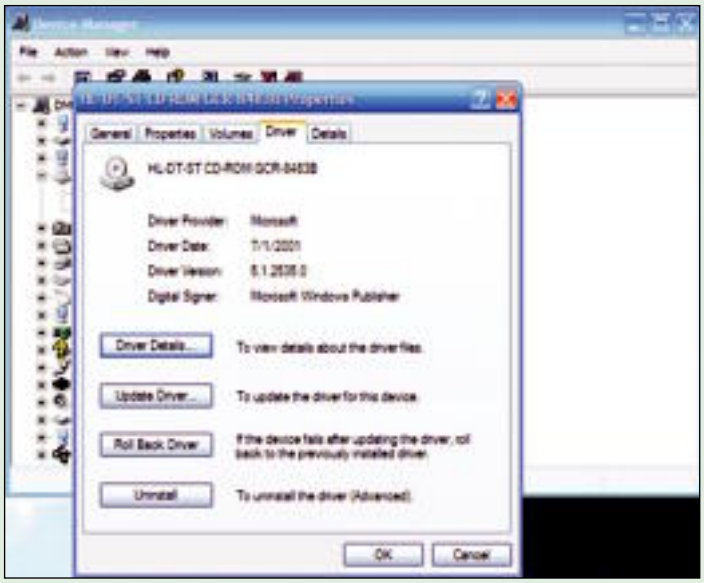
VISTA ACTIVATION ODDITIES

I bought a copy of Vista, ran home, and installed it. For a number of reasons—an inability to find the right drivers, system slowdowns, fear of losing my key because of over-activation, and plain laziness—I never activated it. When I finally felt I could live without my copy of XP, I attempted a clean install. When I tried to activate Vista, I got an error message that said my key was for an upgrade

only, not a clean install. Was I supposed to reformat, install XP, then install Vista?

—Patrick Ignaczak

The Doctor would like to welcome you to the ever-confusing world of product activation and OS versions. In this case, you have clearly purchased an upgrade copy of Vista. In theory, you're supposed to install that overtop your XP installation, as the disc will prevent you from installing Vista on a wiped—or "clean"—drive. That said, there is an ingenious workaround to the issue. Install Vista, but don't enter a product key when prompted. This will get you a 30-day trial version of the OS. Once it is up and running, fire up your upgrade disc and install Vista once again, entering your product key when asked. You'll get a fresh, clean installation of the OS without ever having to touch XP.



If you're using alternate drivers for your optical drive, don't. Windows XP should automatically be able to configure any disc reader you have.

A DUSTY DVD COLLECTION

I recently removed my DVD drive from my PC to reinstall Windows on my son's PC, as his CD-ROM drive was too slow. When I put the drive back in my PC, the BIOS was able to see the drive, but I could not get it to work (it doesn't show up in Windows Explorer, and bootable CDs won't boot on my computer). I bought a new DVD drive, but it doesn't work on this computer. And, yes, I reinstalled the drivers from both manufacturers.

I had another hard drive and was able to reinstall Windows (using the same DVD drive on the same computer), and everything is working fine now. I would like to put the old hard drive back and put the whole system back the way it was, but I still do not understand why Windows refuses to recognize the DVD drive.

—Roy Bellon

It's a little tough to diagnose your problem without knowing which motherboard and OS you're running and the make and model of the optical drives. Still, the Doc will take a stab at it. The fact that you were able to reinstall Windows on your PC using a different hard drive indicates that your problem is with Windows and not a hardware problem. If you are running Windows XP, you do not need drivers for the optical device. You should uninstall any drivers that you installed, as they are for older operating systems. If you recently installed a game that uses StarForce protection, that may also be an issue, as it is notorious for wreaking havoc on optical drives.

Finally, your problem could be as simple as a bad cable or a bent pin on the drive. You should also double-check the jumpers on both drives on the chain and try both cable select and slave and master to see if that solves your problem.

SPLINTER CELL: PAINFUL SCREECH

I am running two 8800 GTX cards in SLI on an Asus P5N32-SLI Premium mobo with two gigs of RAM and an Intel Core 2 E6700 overclocked to 2.93GHZ. I have a Sound Blaster X-Fi Xtreme Music soundcard. After I load Splinter Cell: Double Agent the sound dies after a few minutes and is replaced by a loud, high-pitched squeal. I have to reboot to get rid of the noise. Interestingly, if I disable SLI, the game will run without this sound occurring, but the frame rate drops dramatically. I have tried reinstalling both the game and the soundcard drivers many times, but that has not fixed the problem. I have only one available PCI slot, so installing the card in a different slot is not an option. I do not have this problem with any other games.

—Daniel Guerand

Daniel, you're running into a problem that's often reported to the Doctor but that he has never been able to reproduce. According to Creative, the problem occurs because certain motherboard BIOSes incorrectly enumerate add-in cards. Some people describe the sound as a "screech of death" while others call it a "snap, crackle, pop." The majority of problems have occurred with nForce chipsets, but the issue is not limited to that part. Back in the Voodoo2 SLI days, many soundcards were blamed for screeching and popping sounds as well. The problem, called bus hogging, happened because the graphics card would hog the PCI bus and not release it (remember, it's a shared roadway) within industry-standard specs.

The Doctor suspects a similar problem is happening in this case, but as he said, he has never experienced it using X-Fi cards and nForce or Intel chipsets. That doesn't mean you're totally hosed. Some people have reported that updating the board's BIOS corrects the problem, while others say that the latest drivers from Creative will do the trick. The Doc recommends that you grab the latest BIOS for your Asus board and run the auto-update program from the support section of Soundblaster.com.

EXTERNALLY CURIOUS

I am buying an external hard drive and will install Windows XP on it. I plan on using it as a portable OS when I use other PCs. Will the external drive have conflicts with other PCs when I use it?

—Alfred Braxton

Well, provided you don't mind a bit of a speed choke, you'll be perfectly fine installing XP on an external drive. The Doctor is assuming, of course, that you're using a standard USB connection to hook the drive to a computer. If your external device uses an eSATA connection, you'll see no performance difference whatsoever—it would be as if you were using a drive nestled in your machine to boot XP.

That said, you won't be able to use said external drive as a "local" copy of XP for machines you connect it to. Remember, XP installs a ton of files based on the detected hardware of the machine it's attached to. Unless you plan on using your OS on machines that are all identical, you're going to run into a nightmare of compatibility issues that will prevent XP from running in the first place. MPC

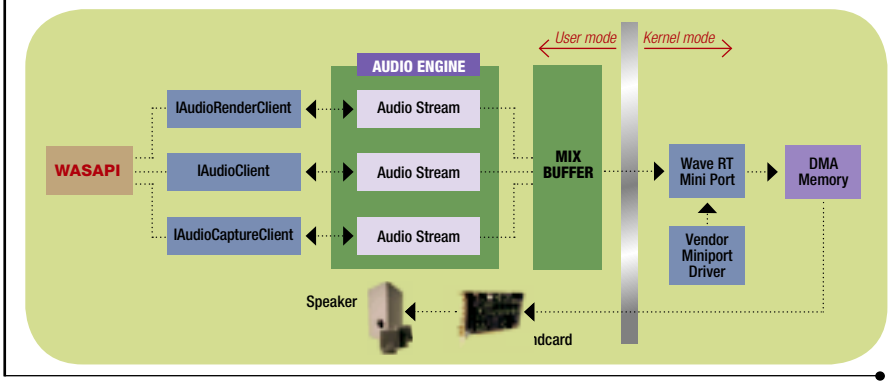
The Doctor jokes around a lot, he realizes. But there's one thing he's 100 percent serious about: bears. If you're sitting there gaming away and you see a bear looking into your basement window, just stop. Stop what you're doing. Don't email the Doctor via **doctor@maximumpc.com**; definitely don't send him anything about the computer-related issues you're having. Grab your can of bear spray and prepare for the inevitable. It's coming.

White Paper: Audio in Vista

Cha- cha- cha- changes: Microsoft re-architects Windows's sound system

BY ZACK **STERN**

HOW IT WORKS **Windows Vista Audio Stack**



Microsoft had two key objectives for Vista's audio system: Move as much of the process out of Kernel mode as possible and reduce latency by significantly streamlining the entire audio stack.

Windows Vista plays David Bowie songs—and all other types of audio—differently than Windows XP does. You won't *see* the differences, because the changes are deep beneath the surface of the new OS, but you'll probably hear them. And that can be a good thing—or a very bad thing.

Microsoft, you see, fired most of the band while designing Vista's audio subsystem: The company's engineers rewrote and reorganized the entire audio stack, moving nearly all kernel functions to the user level. The benefits of this move are twofold: First, any bug that might creep into the audio system affects only the audio system; it doesn't bring down the entire OS. Second, the change increases the number of programmers who are qualified to develop new audio applications because programming at the user level is much easier than programming at the kernel level.

When you consider that the Windows audio system has changed very little since Windows 98, an overhaul was long overdue. In the midst of this transition, however, Microsoft dumped support for the custom property set that enabled DirectSound and DirectSound3D processing to be offloaded to a soundcard or even an integrated audio system. The host CPU must now perform these calls. (Microsoft says its research indicates that only four percent of PC users have soundcards, but we know that number is much higher among *Maximum PC* readers.)

THE LONG AND WINDING ROAD

Over time, less and less software will rely on the legacy Windows audio architecture, and Microsoft claims that applications properly designed to use DirectSound and DirectSound3D should work fine in the new environment. But without access to hardware acceleration, many applications that utilize widely adopted but proprietary advanced audio APIs (application program interfaces), such as Creative's EAX, will revert to stereo when running in Vista.

Microsoft worked with Creative Labs and Nvidia for more than a year to develop a new driver model that would enable hardware acceleration in Vista but pulled out of the initiative when Nvidia exited the audio-hardware market. Creative then turned all its attention to the development of the free OpenAL API. Applications that use OpenAL behave the same way in Vista as they do in XP: Calls to OpenAL fall back to software mode (the code is executed on the host CPU if no dedicated soundcard is available). Creative is also developing a solution—called ALchemy—that will translate DirectSound3D and EAX calls to OpenAL in real time so that they can also be executed in hardware.

Microsoft maintains that its changes render Vista more stable than XP; what's more, it claims Vista's audio system should deliver higher fidelity than previous versions of Windows. This latter claim stems from the fact that the new audio system uses a 32-bit floating-point pipeline, compared to XP's 16-bit integer pipeline. If a DSP (digital signal processing) algorithm causes a buffer overflow, the result is typically distortion and other undesirable audible artifacts. This shouldn't happen with a 32-bit FP pipeline.

This doesn't change the fact that Vista has developed a bad reputation among gamers, but it's difficult to determine whether the operating system's stability issues—not all of which are associated with soundcards—are related to the way games are coded for Windows (i.e., poorly) or the way the OS itself is written (ditto). Evaluating claims of audio fidelity should be an easier task.

WILL IT GO AROUND IN CIRCLES?

Vista's audio architecture is based on three major APIs: the Multimedia Device API (used to catalog and manage audio endpoints, such as microphones and speakers), the Device Topology API (a tool programmers use to interrogate audio hardware, such as soundcards, so they can create a software control panel that can access all that device's features), and the core of Vista's audio system, the Windows Audio Session API (WASAPI), which actually renders and captures audio streams.

Three smaller APIs take their place beneath WASAPI in the Vista audio stack: IAudioClient acts as a gateway so that audio can stream between an audio application and the Vista Audio Engine. IAudioRenderClient is an interface that audio-rendering applications use to stream their output to an audio endpoint device. The last of these four APIs, IAudioCaptureClient, is used by audio-capture applications to record audio from capture endpoints.

In what Microsoft describes as Shared mode, each of these IAudio clients builds a stream in the audio engine, and then all these streams are mixed in the mix buffer. The mixed audio is then passed to the kernel-streaming endpoint. This is

the final stage that occurs in User mode. From here, audio moves to the audio driver in Kernel mode, where it encounters the kernel-mode driver known as Port Class (portcls.sys).

Port Class works on what Microsoft calls a mini-port model: By providing the generic functionality that an audio device needs in order to function within Vista, the hardware vendor needs only to provide a set of mini-port drivers to handle the hardware-specific functions that their product is capable of performing. In order to discourage hardware vendors from creating complex drivers in Kernel mode, Microsoft has built a technology called System Effects into the Vista audio pipeline. System Effects allows the hardware vendor to create custom DSP effects programmed to operate in User mode.

PUT THE LIME IN THE COCONUT

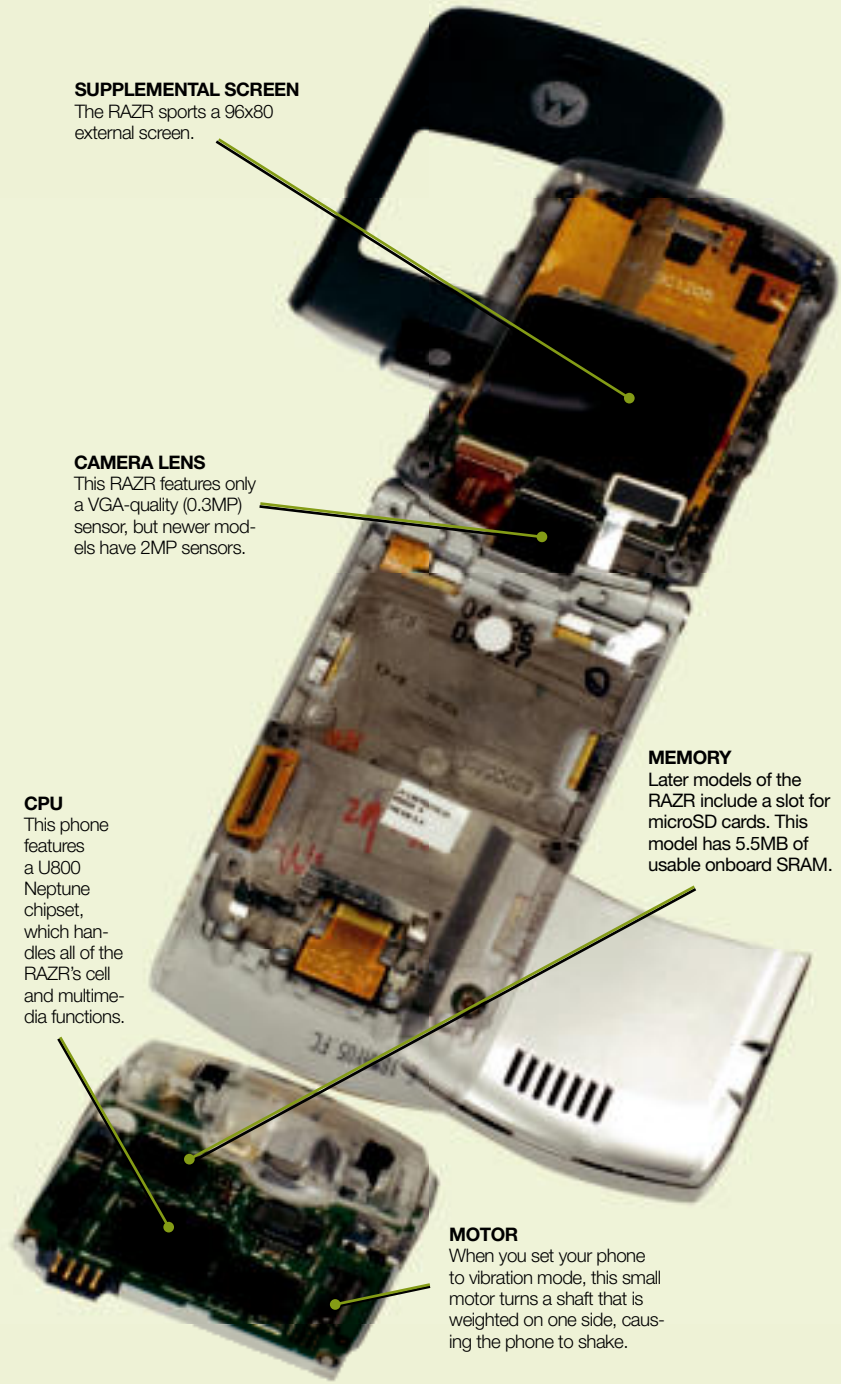
Microsoft created a new class of mini-port driver for Vista called WaveRT (RT being short for real time). Using the vendor-supplied WaveRT mini-port driver, Vista can capture the audio data and store it in a region of DMA memory so that it doesn't require intervention from the host CPU. The audio playback device (here again, either a soundcard or an integrated audio chip) can then access this memory directly, pass the data contained within it to its digital-to-analog converter (DAC), and output the result to your speakers.

Musicians using PC-based pro-audio gear—such as Digidesign's Pro Tools or Cakewalk's Sonar—want even less latency, and Microsoft is accommodating them with a feature known as WASAPI Exclusive mode. In this mode, Vista maps the DMA memory all the way up into application space, so the audio is rendered to the hardware even faster. Software using Exclusive mode bypasses the entire Vista audio engine, and the OS doesn't perform any mixing or digital signal processing at all. Over time, Vista's WASAPI Exclusive mode will likely displace ASIO (Audio Stream Input/Output), a low-latency protocol developed and freely licensed by software-developer Steinberg.

These new processes significantly reduce the latency of the audio subsystem, which should reduce or eliminate common problems such as audio that's out of sync with video and audio glitches. It should also enable vendors to create entirely new types of audio hardware and audio applications without the need to create complex drivers down in Kernel mode. And Microsoft hopes that keeping developers out of the kernel will render Vista more stable overall—leaving only Microsoft to blame if the OS doesn't deliver on that promise. MPC

Cell Phone

Yesterday's $500 phone is today's giveaway. We crack open the case on the best cell-phone technology 2005 had to offer—Motorola's RAZR V3.



SUPPLEMENTAL SCREEN
The RAZR sports a 96x80 external screen.

CAMERA LENS
This RAZR features only a VGA-quality (0.3MP) sensor, but newer models have 2MP sensors.

CPU
This phone features a U800 Neptune chipset, which handles all of the RAZR's cell and multimedia functions.

MEMORY
Later models of the RAZR include a slot for microSD cards. This model has 5.5MB of usable onboard SRAM.

MOTOR
When you set your phone to vibration mode, this small motor turns a shaft that is weighted on one side, causing the phone to shake.

Any requests? What hardware—new or old—would you like to see go under *Maximum PC's* autopsy knife? Email your suggestions to **input@maximumpc.com.**

MICHAEL **BROWN**

Suffers Through Another Ageia PhysX Experience

If CellFactor: Revolution is the best physics-based gameplay we can expect, Ageia is doomed

Thanks to my awesome "psi power," I was able to crush this bot by throwing a massive concrete pipe that was conveniently lying around.

I've said it before and I'll say it again: Hardware-accelerated physics is a good idea. And if it's going to be done in hardware, it should be done with dedicated silicon. But jeez, Ageia can't seem to market a product to save its life.

CellFactor: Revolution started out as a tech demo for Ageia's PhysX hardware. It looked quasi interesting, but it wasn't even a game when we first saw it. It's much more complete now, and Ageia has made it available to the public for free.

Here's a very old lesson that Ageia can't seem to grasp: The only thing that's going to sell a completely new concept like hardware physics acceleration is an unbelievably kick-ass game that's virtually unplayable without the hardware. Quake did it for the original Voodoo cards. CellFactor: Revolution couldn't sell steel-toe boots to barefoot workers in an anvil factory. Based on the very late beta we played, this game is crap.

This is a big problem for Ageia since it's hard to tell if the game is crap because the PhysX card isn't as powerful as it needs to be, because the PhysX software development kit (SDK) is too hard to use, or simply because the developers don't know how to make a compelling game.

There *are* a few aspects of CellFactor that hold promise for Ageia's technology: As the player, you have the ability to manipulate flowing lava, for instance; you can push the material so that it pours over and immolates your enemy. It would be much cooler if the lava looked better, but it's a start. You can also pick up and throw just about any object in the environment, and you can set gravity mines that suck in everything around them before exploding, spewing shrapnel in all directions. As exciting as all that sounds, everything seems to have the same mass. There's no difference between using your "psi power" to pick up a truck and toss it off a catwalk than there is in rolling a barrel down a hallway.

If the folks at Ageia don't figure out how to sell PhysX soon, their investors are going to roll *them* down the hall—right into the trash bin.

Will Smith

Explains the Pros and Cons of Vista's Parental Controls

We had a good reason for excluding Vista from this month's Maximum PC Challenge, honest!

The problem with most parental-control apps—including the ones we tested this month (see page 28)—is that they ignore the giant pink elephant in the room, administrator access. You see, trying to prevent someone with admin privs from disabling, uninstalling, or otherwise bypassing an app is a losing proposition.

These apps could encourage parents to create limited-user accounts for their kids; however, that's not a good option with XP because a number of common tasks simply don't work with a limited account: Many games won't launch, burning optical discs is verboten, and you can't install or uninstall many apps. Hell, you can't even peruse the complete list of running processes when you're on a limited account.

One thing Vista actually does well is make the limited account usable. With a Vista limited account, many more applications and functions work, but users don't have access to any of the potentially troublesome areas and info that we were able to exploit in order to disable all three parental-control schemes in a matter of hours.

Most of our attacks were simple. First, we rebooted into Safe mode, in which the parental-control apps won't load. Then we looked at recently modified apps to see where the new application was installed. We hit Google, figured out how to disable the apps, then rebooted and browsed as we normally would. Disabling apps inevitably requires admin access in order to modify stuff in C:\Program Files\, the Windows folder, or the registry. With a limited Vista account, access to these areas is disabled.

The only real problem with Vista's parental controls is that you have to use Vista.

How We Test

Real-world benchmarks. Real-world results

Computer performance used to be measured with synthetic tests that had little or no bearing on real-world performance. Even worse, when hardware vendors started tailoring their drivers for these synthetic tests, the performance in actual games and applications sometimes dropped.

At *Maximum PC,* our mantra for testing has always been "real world." We use tests that reflect tasks power users perform every single day. With that in mind, here are the six benchmarks we use to test every system we review.

SYSmark2004 SE: This is an update of the SYSmark2004 benchmark, which uses a suite of such common applications as Microsoft Word, Excel, PowerPoint, Macromedia Dreamweaver, Flash, and Winzip to test general performance. It isn't heavy in multithreading, but it does feature multitasking tests.

Adobe Premiere Pro 2.0: We finally ditched our old standard-def Premiere test for one that uses high-def source material. The test is multithreaded, uses the GPU for transitions, and is brutal. It takes about an hour on our zero-point to render a short two-minute, 46-second benchmark movie in the program.

Adobe Photoshop CS2: We start with a RAW photo shot with a Canon EOS 20D, and apply a crapload of filters and other tasks from CS2 to see just how fast a rig can chew through the workload. Because we use every filter we can, the test is more fair and balanced than the usual cherry picking of Photoshop tests.

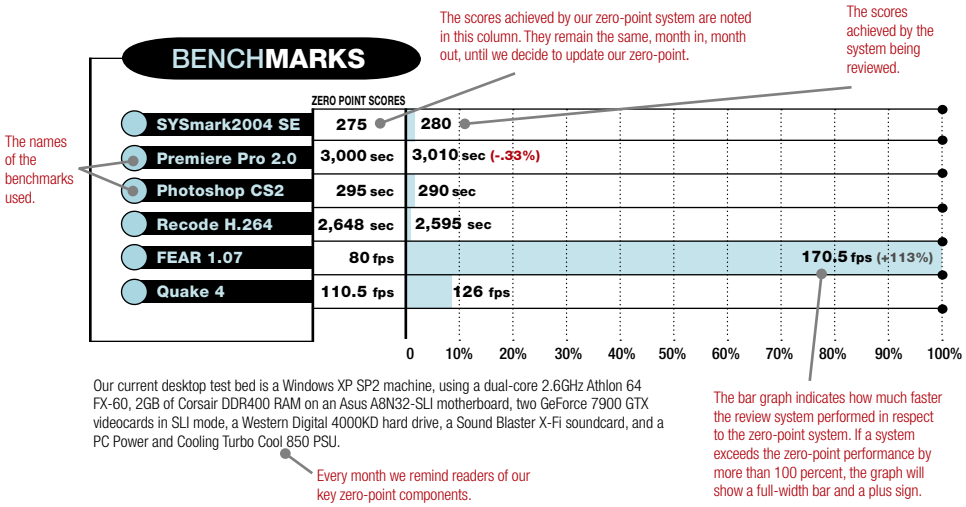
Ahead Nero Recode 2.0: Nero Recode 2.0 is one of the fastest video-transcoding utilities. We copy unencrypted VOB files to the hard drive, then convert the movie to an H.264 file formatted for the Apple iPod's screen. The version included with Nero 7.5, is the only multithreaded H.264 encoder we've found thus far and is optimized for dual-core CPUs.

Quake 4: Based on the Doom 3 engine, Quake 4 is a popular OpenGL game. We run our test at 1600x1200 with 4x antialiasing and 4x anisotropic filtering. Generally, more robust OpenGL drivers yield better performance. We use a custom timedemo recorded using the 1.2 patch, which supports Hyper-Threading and dual-core processors.

FEAR: Monolith's FEAR is a cutting-edge DirectX game that pushes PCs and graphics hardware to the limit. We run FEAR at 1600x1200 with soft shadows, physics, and audio acceleration enabled, using the 1.07 patch.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



BEST OF THE BEST

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard
Asus EN8800 GTX

Midrange videocard
EVGA eGeForce 8800 GTS (320MB)

Soundcard
Creative Labs X-Fi Xtreme Music

Hard drive
Hitachi Deskstar 7K1000
1,000,000MB of storage in a lovely 3.5-inch case—and it's stupid-fast to boot. What's not to love?

External backup drive
Western Digital My Book Pro II

DVD burner
Plextor PX-755SA

High-end LCD monitor
Dell 2707WFP

Budget LCD monitor
Samsung SyncMaster 206BW

Socket AM2 Athlon 64 mobo
Gigabyte GA-M59SLI-S5

Socket 775 Core 2 Duo mobo
Asus Striker Extreme

HD-based MP3 player
Apple iPod

Flash-based MP3 player
SanDisk Sansa Connect 4GB
The Sansa's wireless Internet connection to Yahoo's music service trumps the competition

5.1 speakers
M-Audio Studiophile LX4 5.1 (LX4 2.1 with 5.1 Expander System)

2.0 speakers
Audioengine 5

Midtower case
Antec Nine Hundred

Full-tower case
Gigabyte 3D Aurora 570

Games we are playing:
Infernal, Oblivion: Shivering Isles, S.T.A.L.K.E.R.: Shadow of Chernobyl, Command & Conquer 3: Tiberium Wars

Digital Storm Twister Ultra 4

Back with a vengeance, the latest Twister Ultra 4 is fast and pretty darn stable

The Twister 4 Ultra carries the same name as the previous Athlon-based box, but its performance is all Core 2.

Maximum PC's mandate has always been that performance rules all else. But recently we've been harping about nothing but stability. It's not that we previously ignored this area, but lately we've been inundated with rigs that have been overclocked so aggressively they make our standard benchmarks blow up within minutes. Because of this, our new message has been stability, stability, stability.

Apparently, Digital Storm got our memo. The company shipped us its current speed king: Intel's 2.93GHz Core 2 Extreme Quad-Core QX6800 clocked up to a mere 3.46GHz running a pair of 8800 GTX cards and 2GB of Corsair Dominator RAM cranked up to 1,066MHz, all on an EVGA 680i SLI board. From a hardware perspective, this is nothing new; this setup is similar to what we've been seeing since January.

Normally, this would make for one big yawner of a story, but the Twister hits the right notes for us. First up: performance. Although it doesn't rip the speed crown from the wickedly fast Falcon Northwest Mach V that we reviewed in June, it does manage to top the higher-clocked Falcon in a few runs. Surprisingly, in Adobe Photoshop CS2, the Twister just squeezes by the Mach V with a score of 142 seconds versus 149. The difference is negligible due to the margin of error, but the Falcon Mach V has a 267MHz clock advantage, so count this as a win for the Twister. We're also marking the Nero H.264 encode test as a win for the Twister. Although its score in this test is about a minute slower than the Mach V's, the Twister is running a slower CPU and is 100 percent stable.

The Twister is top gun in our FEAR test, with a score that's just a tad faster than that of the similarly equipped ABS PC that we reviewed in February. So, in performance the Twister holds three Lab records and really doesn't have to apologize for performance elsewhere.

In build quality, we were interested to see if the company paid attention to items the techs missed last time, such as whether all the front USB ports were connected and operating. Fortunately, there were no such bone-headed errors. We do have to point out, however, that connecting two DVD burners to the same PATA port will kill your performance if you try to burn to multiple drives at once.

But is the Twister stable? Yes. We flew through all of our normal benchmarks with no issues—well, except for SYSmark2004 SE, which refused to run. We can't blame the Twister for this though, since

UNDER THE HOOD

BRAINS	
CPU	Intel Core 2 Extreme QX6800 (2.93GHz overclocked to 3.46GHz)
MOBO	EVGA 680i SLI
RAM	2GB Corsair DDR2/800 (Two 1GB sticks@1,066MHz)
LAN	Dual Gigabit LAN (Nvidia)
HARD DRIVES	Two 150GB Raptors (10,000rpm SATA) in RAID 0, and one 750GB Seagate
OPTICAL	Lite-On LH-18AIP x2
BEAUTY	
VIDEOCARD	Two EVGA GeForce 8800GTXs in SLI mode
SOUNDCARD	Sound Blaster X-Fi XtremeGamer
CASE	Modified Cooler Master CMStacker 830
BOOT: 34 sec.	DOWN: 9 sec.

DIGITAL STORM TWISTER ULTRA 4

CASIO
Fast, stable, and nicely configured.

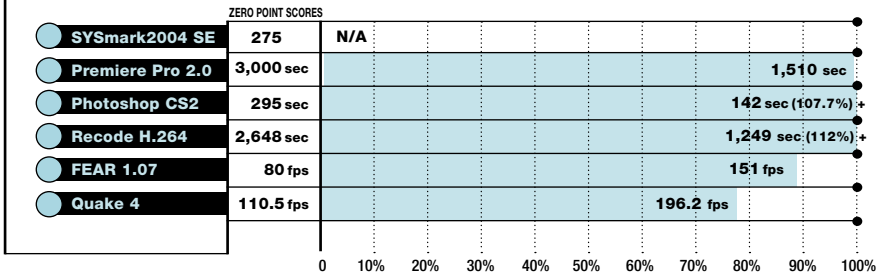
ARMITRON
Two DVD burners on one port. Is no Vista a plus or a minus?

9

MAXIMUM PC KICKASS

$6,600, www.digitalstormonline.com

BENCHMARKS



Our current desktop test bed is a Windows XP SP2 machine, using a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N32-SLI motherboard, two GeForce 7900 GTX videocards in SLI mode, a Western Digital 4000KD hard drive, a Sound Blaster X-Fi soundcard, and a PC Power and Cooling Turbo Cool 850 PSU.

Digital Storm even managed to pretty up the unruly hard-drive area.

SYSmark2004 SE hasn't worked in months. We did run the new SYSmark2007 Preview with no problems, and the Twister achieved an overall score of 219. We also subjected the Twister to our new quad-core torture test, Prime 95, with only one issue. On one of several overnight runs, the app reported a data anomaly, but it didn't crash or lock up. On the Mach V, the Prime 95 test caused a spontaneous reboot within minutes. Our other multithreading tests also went without a hitch. So we have more faith in this rig's long-term stability than in the stability of any machine we've tested since the Polywell Poly I680SLI-QX (March 2007), which sported a stock-clocked quad core.

That leaves the Twister in a great spot. It holds three Lab records and is much cheaper than the Mach V—and it's stable.

—GORDON MAH UNG

Dice Electronics iPod Integration Kit

Keep your eyes on the road and your hands upon the wheel

Finding an aftermarket stereo that blends seamlessly with your car's interior can be an impossible dream; it's certainly not a task you'd want to endure just so you could plug in your iPod. For that, you should consider buying a third-party integration kit that allows you to retrofit your factory unit.

We examined Peripheral Electronics's iSimple iPod Adapter in our June 2007 upgrade feature story, and we're following up that coverage with a review of Dice Electronics's iPod Integration Kit. Dice's product has one cool feature that its competitor's doesn't: an AUX input (in the form of a 1/8-inch stereo jack) that allows you to plug an existing CD player, satellite radio tuner, or non-iPod MP3 player into the iPod integration module.

The trunk-mounted 10-disc CD changer in our test vehicle—a 2002 VW Cabrio—doesn't work that way, so this feature wasn't useful in our situation. But we were even more disappointed to discover that we couldn't use the buttons on our factory stereo to control the iPod either. That's one of the big selling points of these integration kits, and we were able to use our stereo controls with the iSimple adapter we tested last month. We also preferred the iSimple's extra-long docking cable (being 12 feet, you could pass the iPod to a passenger in the backseat; Dice's three-foot cable was just long enough to reach the cup holder in our Cabrio).

Both integration kits require vehicle-specific wiring harnesses, so we weren't able to test either adapter in a variety of vehicles, but we do know that the more advanced your factory stereo is, the more features both products should be capable of. For example, if your factory stereo can display text (i.e., CD and song titles, not just "TRACK 01"), flip a few DIP switches on the back of the adapter and your iPod will pass this data to your head unit for display. But given the fact that the Dice unit didn't deliver the interoperability we expected with our VW, readers should be sure any retailer they purchase a unit from has a satisfaction-guaranteed policy.

Dice Electronics's iPod Integration Kit was not compatible with any domestic cars or trucks at press time, but the company plans to add such support "soon."

—MICHAEL BROWN

DICE IPOD KIT **7**

$160, www.diceelectronics.com

M-Audio Studiophile AV 40 Speaker System

Funk good. Funky bad

Considering their $200 price tag, it's amazing to see how many professional features M-Audio's Studiophile AV 40 reference monitors are packed with, including 1/4-inch balanced inputs that can accommodate long cable runs. But you know the company had to make some compromises—and we found out where the moment we turned the speakers on.

At first, we attributed the low-level hum we heard from the amplifier to a ground loop, which can occur when components with different ground potentials are connected. But after connecting two other systems to the same outlets, we concluded the problem was with the amp. We returned the speakers to M-Audio, and the replacement set we received was a little quieter, but we still detected a funky buzz when we pressed our ear to the driver. If you're using these speakers for recording, mix-down, or other critical listening tasks, the noise will haunt you because you won't know if it's coming from your instruments, your mic, or some piece of outboard gear.

The AV 40s do exhibit a characteristic that is essential for any speaker laying claim to the "studio monitor" moniker: pancake-flat frequency response that doesn't add to, subtract from, or otherwise color recorded music. The 20-watt-per-channel class A/B amplifier is well suited for near-field listening, but if you also want to use the system for recreational listening or even gaming, simply flip the bass-boost switch on the back and be rewarded with just a little more thump in the low end. Even in this mode, bass response is far short of what M-Audio's subwoofer-equipped Studiophile LX4 system dishes out, but it's impressive for monitors in this price range.

Listening to the power funk of Tower of Power's "Oakland Stroke," we were impressed by the AV 40s's ability to deliver the band's full sonic spectrum, from the belch of Stephen "Doc" Kupka's baritone sax to the crackle and snap of Dave Garibaldi's drum work. But we'd score these speakers much higher if the amp were quieter.

M-Audio's Studiophile AV 40 speakers have both 1/4-inch balanced and RCA inputs in back; there's a 1/8-inch stereo input and headphone jack in front.

—MICHAEL BROWN

STUDIOPHILE AV 40 **7**

$200, www.m-audio.com

SLI Madness

CrossFire? Feh! For those looking to double their GPU action, SLI is the only game in town

Gamers who have faith that AMD/ATI can get back in the game with its dual-card strategy may want to wait a month or three, but if you have to build *today*, SLI is the sure bet. This month we finally get a look at a 680i board that isn't a cookie-cutter copy of earlier models and compare it to a budget SLI board.

—GORDON MAH UNG

The MSI P6N SLI Platinum: SLI without the frills.

ABIT IN9 32X-MAX

If you've seen one Nvidia 680i reference board, you've seen them all. Not so with Abit's IN9 32X-MAX board, which thumbs its nose at the me-too crowd. The IN9 32X-MAX features Nvidia's top 680i chipset, which gets you two x16 PCI-E slots for SLI, a third full-length x8 PCI-E slot for graphics, and support for unannounced, unofficial 1,333MHz FSB processors.

We've nagged Abit about funky slot configurations before, but the IN9 makes no such mistakes. With dual 8800s installed, you have access to one PCI, one x8 PCI-E, and one x1 PCI-E slot. The layout of the IN9 is nearly flawless; our only complaint is that our unit didn't come with an auxiliary fan to cool the voltage regulators. It's supposed to be included, but ours was apparently lost.

To make the board worthy of the "MAX" moniker, Abit bundles in Wi-Fi, surface-mounted buttons, an HDMI header for audio, and a rear-mounted CMOS reset switch, should your overclocking project go sideways.

Overclocking is one area in which the IN9 has a big advantage over the MSI board (reviewed next). We ran the IN9 with a 1.86GHz Core 2 Duo E6300 with the FSB pushed up to 1,333MHz and even did a few runs at over 1,400MHz with no issues.

With performance a nonissue, we think the choice comes down to features. The enthusiast-oriented features of the IN9 push it beyond the budget MSI board. Still this isn't the best 680i board we've seen. That honor goes to Asus's awesome Striker Extreme.

Abit's IN9 is no boring reference board.

ABIT IN9 32X-MAX

DRIVE-BY TRUCKERS
Easy-to-use BIOS is still our favorite.

TRUCKER HATS
Mediocre documentation; Realtek audio doesn't support EAX.

9

$400, www.abit-usa.com

MSI P6N SLI PLATINUM

Make no bones about it, the MSI P6N SLI Platinum is a budget Core 2 board that gets you SLI for a song and a dance. It features the cheapest chipset available with SLI: the Nforce 650i SLI.

To make a 650i chipset, take a 680i SLI and cut two SATA ports, lose support for SLI memory, cut a Gigabit Ethernet port, and lose a pair of USB ports. Oh, you also have to chop one of the x16 PCI-E slots, as well as LinkBoost, and settle for one of those old-school manual SLI switches.

If it feels like the P6N SLI Platinum is akin to a budget car with manual steering and windows, it is. However, step on the gas and this card is plenty fast. We ran both boards reviewed here using a 1.86GHz Core 2 Duo E6300 mildly overclocked to 2.33GHz on a 1,333MHz FSB with no problems at all. We did get a message that this board doesn't support OC'd 1,066MHz FSB CPUs, but MSI told us it's just an advisory. Although we had an easier time overclocking to higher front-side freqs with the Abit, we suspect the same can be done with the P6N SLI Platinum if you have the time to finesse it.

What's interesting are the performance numbers. With the RAM manually set and the same drivers and hardware, we didn't see any major gaps. In a way, it's like when Toyota takes a Camry, slaps on some tech and paint and relabels it a Lexus. If you're willing to forgo power seats, power windows, and AC, the P6N SLI Platinum is a fine ride.

MSI P6N SLI PLATINUM

EDITH FROST
Auto-update for drivers should be adopted by others.

FROSTED FLAKES
Realtek audio doesn't support EAX.

8

$180, www.msicomputer.com

BENCHMARKS

	MSI P6N SLI PLATINUM NFORCE 650I SLI	ABIT IN9 32X-MAX NFORCE 680I SLI
CPU SPEED/FSB (MHZ)	2333/1333*	2333/1333
3DMARK2001SE	**38,508**	38,283
3DMARK05	14,242	**14,277**
3DMARK06	9,422	**9,574**
FEAR 1.07 (FPS)	204	**209**
PC MARK 2005 OVERALL	7,089	**7,215**
PCMARK 2005 RAM	5,424	**5,698**
PCMARK 2005 GPU	8,338	**8,958**
PCMARK 2005 HDD	**6,845**	6,563
VALVE PARTICLE TEST	**40**	37

Best scores are bolded. Test used two 7900 GTX cards, 1.86GHz Core 2 Duo E6300 overclocked to 2.33GHz, 1KW PCPC power supply, 2GB DDR2/800 RAM.
**Limited by BIOS but can be overridden in Windows Utility*

Blasé about Blu-ray Burners

We review two new choices in a market that holds little interest for us

We're not saying a high-definition optical burner is a useless purchase these days, but only a select few folks can justify owning one. If data backup is your bag, you can't argue with the convenience of Blu-ray's large-capacity discs—25GB for single layer and twice that for double layer—but you can pitch a fit about media costs: $20 and $40 apiece, respectively. An external backup drive is a bargain by comparison. The most compelling reason we can think of for owning a Blu-ray burner today is if you have a high-def video camera and want to author your own HD discs—for yourself or other folks who own a Blu-ray player, natch.

Whatever your motivation, here's what we've learned about two of the latest models.

—KATHERINE STEVENSON

LITE-ON BD TRIPLE WRITER LH-2B1S

As far as Blu-ray burners go, Lite-On's Triple Writer comes across as the most forward-looking, with the simple inclusion of a serial ATA interface—a feature that's been sorely lacking in all the other Blu-ray drives we've tested. Really, it should be standard issue with any so-called next-gen device, as parallel support will only get more scarce over time.

Lite-On's Triple Writer is the only Blu-ray drive we've tested that sports a SATA interface.

LaCie's d2 is actually a rebadged Panasonic drive, like the Plextor and IO DATA burners we reviewed in December 2006.

The Triple Writer also stands out with an illuminated indicator strip across its front bezel that informs you of drive activity and whether it involves BD, DVD, or CD media. Maximum theoretical write speeds for the three formats are 2x, 12x, and 32x, respectively. A 2x BD burn speed is standard in today's Blu-ray drives; DVD and CD speeds are typically capped at 8x and 24x, respectively.

In our DVD burn test, the Triple Writer wrote 4.38GB of data to a single-layer DVD+R in 7:09 (min:sec), besting all previously tested Blu-ray drives by a good two minutes. As expected, the TW was with the pack in BD-R burns, taking a leisurely 46:41 to fill a 25GB write-once disc, but its performance with rewriteable media surprised us. All the other drives we tested took approximately twice as long to write to BD-RE as to BD-R—the result of a data verification process. But Lite-On feels confident enough with its Triple Writer to have disabled verification in the drive in order to increase BD-RE write speeds. In our admittedly limited tests, we had no problems reading the TW's BD-RE discs.

In fact, taking into account the TW's relatively low price, its SATA interface, and its superior CD and DVD write speeds, the Triple Writer is the closest thing to something we might buy—not that we're even considering it.

LITE-ON BD TRIPLE WRITER LH-2B1S

BLUE VELVET
SATA interface, better-than-average CD/DVD specs, lowest price.

BLUE LAGOON
Still expensive, limited usefulness, BD burns take a long time.

8

$600, www.liteon.com

LACIE D2 BLU-RAY DRIVE

Like the Plextor PX-B900A and the IO Data BRD-UM2/U that we reviewed in December 2006, the d2 is actually a Panasonic-manufactured Blu-ray burner. The drive is encased in a LaCie-branded brushed-metal shell that offers both USB 2.0 and FireWire connectors. Roxio's Easy Media Creator 8.2 comes bundled with the package.

As with all the Blu-ray drives we've tested, other than the Lite-On above, the d2 is spec'd to write CD, DVD, and BD at maximum speeds of 24x, 8x, and 2x, respectively. And not surprisingly, the d2 turned in benchmark scores that were right in line with its similarly spec'd brethren: 9:08 (min:sec) to write to DVD+R, 45:31 to fill a 25GB single-layer BD disc, and 99:38 to fill a rewriteable (BD-RE) disc of the same capacity. Indeed, there is nothing especially noteworthy about the d2, besides the fact that it costs $400 more than Lite-On's Triple Writer.

LACIE D2 BLU-RAY DRIVE

BARNEY RUBBLE
USB and FireWire interfaces are convenient.

BURNING RUBBLE
We should pay this much money to watch the paint dry during Blu-ray burns?!

6

$1,000, www.lacie.com

BENCHMARKS

	LITE-ON	LACIE
DVD WRITE SPEED AVERAGE	**8.95x**	6.78x
DVD READ SPEED AVERAGE	**9.36x**	6.16x
ACCESS TIME (RANDOM/FULL)	**138ms/216ms**	159ms/305ms
CPU UTILIZATION (8X)	**31%**	44%
TIME TO BURN 22.5GB TO BD-R (MIN:SEC)	46:41	**45:31**
TIME TO BURN 22.5GB TO BD-RE (MIN:SEC)	**46:36**	99:39

Best scores are bolded. All tests were conducted using the latest version of Nero CD-DVD Speed. Our test bed is a Windows XP SP2 machine, using a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N-SLI motherboard, an ATI X1950 Pro videocard, a Western Digital 4000KD hard drive, and a PC Power and Cooling Turbo Cool 850 PSU.

Corsair 16GB Flash Voyager

This little key can swallow more data than a dual-layer DVD disc

Corsair pushes the 16GB boundary with its affordable Flash Voyager key.

Ain't technology wonderful? Just a few years ago our mouths were agape at 1GB USB thumb drives that cost $500. Yet here we have Corsair pushing the 16GB mark for $140—a mere $8.75 per GB.

The Flash Voyager looks the same as previous models, except for its color. The standard-speed device is blue, while the faster GT model is red. Although the rubberized case gives the unit a fairly rugged feel, we have torn through the rubber key-ring loop on older units. Oddly, no driver or encryption software was included with our device. Corsair normally bundles the open-source TrueCrypt software with its products, which is passable though inconvenient.

In performance, the fat Flash Voyager is an interesting story. Of the seven keys we've tested recently, the 16GB Flash Voyager is the second fastest in small-file writes, taking about eight minutes to write 10,315 files. The stupendously fast Kingston 4GB Secure Traveler took three minutes, while the rest of the pack clocked in with scores of 20 minutes or more.

The Flash Voyager's biggest weakness is in writing medium and large files. The key took 4:10 (min:sec) to write about 2GB of large files, which was almost a minute slower than even the hard-disk-based Verbatim Store 'n' Go we reviewed last month.

The 16GB Flash Voyager also trailed the Verbatim in writing medium-size JPG files. Not pretty. Payback came in read speeds, as the Flash Voyager aced the small-, medium-, and large-file reads, achieving speeds equal to those of the fastest keys we've benchmarked.

So what you have is a key that reads files very quickly and is pretty good at writing small files but could take a minute longer than a hard-disk unit and almost four times longer than the Flash Voyager GT to write large files, which is odd because a 16GB key seems as though it were made to write huge ISO and image files, not read gigabytes of text files. We don't think the medium- and large-file write performance is terminal, but it certainly doesn't reach the yee-haw speeds of its red-cased brethren.

—GORDON MAH UNG

CORSAIR 16GB FLASH **8**

$180, www.corsairmicro.com

Thermaltake 7-Inch Touch Screen LCD Monitor

A secondary LCD can sometimes be better than a real monitor

You will squeal with delight the first time this seven-inch display pops out of its enclosure, eagerly awaiting your greasy fingers.

You're still using *one* monitor? That is so old school we're not even going to offer a snarky comment about it. Nope. Not a word. But if you don't have the desk space for a second display, Thermaltake has you covered. The company's seven-inch LCD monitor is an awesome addition to your rig—with the caveat that unless you have a matching Thermaltake case, you're likely SOL.

As a supplemental display, Thermaltake's seven-incher is almost a full-fledged monitor, although the unit's small size and meager 1280x1024 resolution somewhat distance it from what we would typically use. The display itself is a retractable touch screen—something you rarely see on car displays, let alone computer displays.

Installing the display is as easy as stuffing the device into a seven-inch drive bay, wherein we find its biggest fault. Do *you* have a seven-inch drive bay in your case? We sure don't—not in any of the chassis in our Lab, save for Thermaltake-branded designs. Unless you're skilled with a hacksaw, purchasing this monitor will require you to pick up a new case as well, which is a total letdown since it's such a sweet device.

Simply put, although it's pricey, the Thermaltake display is light-years beyond anything else out there, save for actual touch-screen-based computers. And controlling your computer by tapping your finger is simply too fun. Cooler still, you can plug standard RCA cables into the back of the unit. Control a DVD playing on your main monitor using the touch screen; then switch to a game of Wii Tennis during the boring parts. Life just doesn't get much better than that.

We'll be waiting with bated breath for Thermaltake to release a version of this monitor that isn't tied to its cases. (Though we highly doubt that day will ever arrive.) You're certainly getting more than you bargained for with the seven-inch display, just prepare for some additional purchases.

—DAVID MURPHY

THERMALTAKE MONITOR **8**

$350, www.thermaltakeusa.com

Hitachi Deskstar 7K1000 Hard Drive

Whoever said size isn't everything was lying to you, trust us

Cheese and crackers! This drive will hold a load of music, video, and... umm... anything else.

Holy hell, man. We have been waiting for this day for a long time, and Hitachi is the first hard-drive manufacturer out of the gate to meet our terabyte-size storage needs. Yes, that's right. A terabyte. One thousand gigabytes stuffed into a hard drive, or in this case, a Deskstar.

For those keeping score at home, that's 250GB more than the current storage leader, Seagate's 750GB Barracuda drive. And while the differences aren't quite as dramatic in terms of speed, Hitachi's 7K1000 storage monster still beats out the Seagate in our HD Tach benchmarks.

The Deskstar 7K1000 drive sports five platters with 200GB of storage apiece, which doesn't give the device an amazing areal density, especially compared to its smaller peers. In theory, drives with a higher areal density perform better, but not so when it comes to the 7K1000. We recorded a whopping 72.7MB/s for the drive's average read test, which curb-stomps the Seagate's now-paltry 66MB/s. While Western Digital's Raptor drive tops that score with a random access speed of 77.9MB/s, it's also less than one-sixth the capacity of the 7K1000.

BENCHMARKS

	HITACHI DESKSTAR	SEAGATE BARRACUDA
SIZE	1,000GB	750GB
RANDOM ACCESS (MS)	**13.1**	13.4
AVERAGE READ (MB/S)	**72.7**	66
BURST SPEED (MB/S)	206.9	**236.9**

Best scores are bolded.

Looking at random access times—a measure of a hard drive's ability to pull information from a variety of different spots on the disks—Hitachi's terabyte drive again tops the Barracuda, by only 0.3 of a millisecond, but a difference nonetheless. As one might expect, the Raptor drive retains its speed-king position. You'd merely need to RAID seven of them together to get the capacity of the 7K1000.

In a comparison of apples and oranges—the Raptor's speed versus the Barracuda's size—Hitachi's terabyte drive is nothing short of a watermelon. It's the fastest of all the drives in its class, of which there is one, and even tops the drives that hover around the meager 500GB mark. Toss in the *terabyte* of storage, and you get an absolute winner.

—DAVID MURPHY

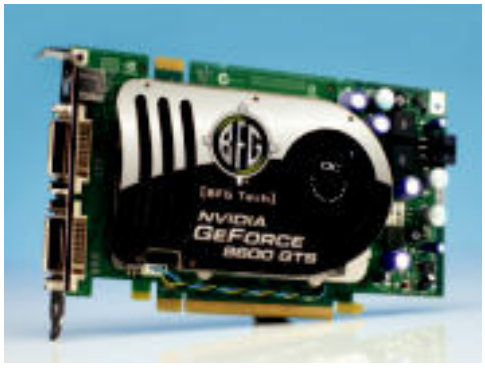
DESKSTAR 7K1000 **9**

$400, www.hitachi.com

MAXIMUM PC KICKASS

BFG 8600 GTS OC

We're stifling a yawn over this cheaper DX10 card



Cards based on the 8600 GTS offer HDCP decryption on both links, so you can watch copy-protected Blu-ray and HD DVD movies on 30-inch monitors.

We thought DirectX 10 was going to be a crucial factor by now, but Vista is so screwed up from a gaming perspective we can't recommend installing it. And then there's the issue of high-def video playback to consider. Oy vey!

If you have just $200 to spend on your next videocard, don't see a Vista upgrade in your near future, and don't think Microsoft will relent and release DX10 for XP, you'll want to compare Nvidia's GeForce 8600 GTS to ATI's Radeon X1950 Pro. In many cases, cards based on the latter are cheaper than those based on the former, leaving you with enough money to buy a new game.

Prices aside, which card is the better value? The answer depends on what you need from your videocard. In terms of gaming performance, the Radeon X1950 Pro is the hands-down winner. Although it has lower clock rates on both its GPU and memory, the chip has more shader units (48 to the 8600 GTS's 32) and a 256-bit memory interface (compared to the 8800 GTS's 128-bit memory path). These specs help ATI's part beat Nvidia's to a bloody pulp in FEAR (outrunning it by a 39-percent margin at 1920x1200 resolution) and rendering Supreme Commander at least tolerable at that same high resolution.

BENCHMARKS

	ATI RADEON X1950 PRO	BFG 8600 GTS OC
3DMARK06 GAME 1 (FPS)	**9.7**	7.1
3DMARK06 GAME 2 (FPS)	**8.6**	7.9
QUAKE 4 (FPS)	**42.4**	36.7
FEAR (FPS)	**32**	23.0
SUPREME COMMANDER (FPS)	**20.7**	14.7

Best scores are bolded. All benchmarks run at 1920x1200 with 4x AA and 8x aniso. FEAR tested with soft shadows on; Quake 4 tested in High Quality. Cards were installed in an EVGA nForce 680i SLI motherboard with a 2.93GHz Intel Core 2 Extreme X6800 CPU and 2GB of Corsair DDR2 RAM.

We didn't see much of a difference in DVD-decoding performance between the two cards, but the new PureVideo HD engine in Nvidia's GPU makes it the clear favorite if you're looking to play Blu-ray or HD DVD movies on your machine. The 8600 GTS will relieve the CPU of more of the high-definition decoding chores, which is an important consideration if your machine is outfitted with a less-powerful processor.

Considering our low opinion of the next-gen optical-drive formats and the utter insignificance of Vista (and, by unfortunate extension, DirectX 10), we just can't get very excited about the 8600 GTS.

—MICHAEL BROWN

BFG 8600 GTS OC **7**

$220, www.bfgtech.com

Media Player Playoff

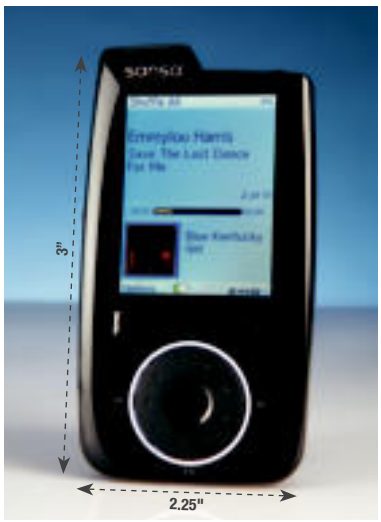
Craving innovation? Look beyond the iPod

Media players—other than Apple's largely overrated iPods, that is—are rapidly approaching commodity status. Cowon and SanDisk have taken very different approaches by adding features that set their products apart from the hundreds of others crowding store shelves.

—MICHAEL BROWN

SANDISK SANSA CONNECT 4GB

Microsoft's idea of letting people share their favorite songs using a wireless connection was as botched in execution as it was brilliant in conception. SanDisk's Sansa Connect makes much more sense, although it requires users who want to share to cough up the $12- to $15-per-month subscription fee for Yahoo's Music Unlimited to Go service.



The control wheel and buttons on the Sansa Connect have been improved in every way over previous Sansa models.

Unlike the Zune's silly wireless-sharing capability, the Sansa Connect's networking feature is useful, even if you're not interested in sharing or renting music. The device can join any Wi-Fi network (with support for WEP, WPA, or WPA2 security, but not Enterprise authentication) and it uses two free Yahoo services: Launchcast Internet radio and the Flickr photo-sharing service.

The Internet radio service is particularly cool because it uses the Zing Mobile Entertainment Engine to automatically create playlists based on the songs you've listened to. This works much like the Internet services Pandora and Last.fm do on the PC, and it's a terrific way to discover new artists.

Although the Sansa Connect sounds very good, we do wish SanDisk hadn't limited the player to just MP3, WMA, and secure WMA audio formats at maximum bitrates of 320Kb/s VBR. We find ourselves increasingly enamored with the pristine quality of losslessly encoded music (FLAC, WMA lossless, etc.), which it doesn't support at all. We do understand the file-size drawbacks: The Tower of Power tune "What Is Hip?" requires about 8MB of storage when encoded (using EAC and LAME) in MP3 format at 320Kb/s VBR, compared to nearly 36MB when encoded using EAC and FLAC.

SANDISK SANSA CONNECT

DOWN TO THE NIGHTCLUB
Wireless networking, Internet radio, great user interface.

COPACABANA
Limited codec support, no support for lossless formats.

9

MAXIMUM PC KICKASS

$250, www.sandisk.com

We dig the Cowon's D2's comprehensive file-format support, and the display is gorgeous; it's just not big enough to be a touch screen.

We dig the wireless networking feature and it sounds fabulous at the bitrates and file formats it does support. SanDisk tells us they *could* support lossless formats with a firmware update, so we're hoping to see that in the next go-round.

COWON D2

Cowon provides a wealth of choice where SanDisk sets severe limits: The D2 supports not only MP3, WMA, and secure WMA, but also OGG, FLAC, and even WAV.

But if you're planning to fill your player with losslessly encoded tracks, drop the extra $30 for the model with 4GB of flash memory. Both players include an SD slot, which renders their storage capacity virtually unlimited, but 2GB is just not enough for a large library of tracks encoded with even a lossy codec.

The D2 doesn't have anything as unique as wireless networking, but it does offer several features the Sansa Connect does not, including video support (320x240 resolution), voice recording, a text reader, and an FM radio tuner. The D2 also features a slick touch screen, but navigating a GUI in three square inches is awkward with the included stylus and nearly impossible with your fingertips. (The stylus can also serve as a kickstand while you're watching videos.)

The D2 is supremely versatile, it sounds fabulous, and it's certainly priced right. Oh, what we wouldn't give to trade its highfalutin touch screen for a simple control wheel and a couple of buttons.

COWON D2

LOOKING FOR SOME TUSH
Support for all types of media, including lossless audio formats.

PUSH YOUR TUSH
Not enough built-in memory.

8

$190, www.cowonamerica.com

SPECS

	SANSA CONNECT	COWON D2
CAPACITY	4GB Flash plus MicroSD slot	2GB Flash plus SD slot
AUDIO FILE FORMATS	MP3, WMA, Secure WMA	MP3, OGG, FLAC, WAV, WMA, Secure WMA
MAX AUDIO BIT RATE	MP3: 320Kb/s VBR	320Kb/s VBR
FM RADIO TUNER	No	Yes
VIDEO FILE FORMATS	N/A	WMV 9, MPEG 4
IMAGE FILE FORMATS	JPEG, PNG	JPEG
SCREEN SIZE (INCHES)	2.2	2.5
TOUCH SCREEN	No	Yes
WI-FI	802.11b/g	N/A

Jabra S5010 Speaker Dock

It's two, two, two brands in one!

Jabra's S5010 speaker dock takes an agnostic approach to audio-player support.

You might know the Jabra brand name from the company's comprehensive lineup of telephone headsets, but designing a tabletop speaker system is vastly different than building the tiny drivers in a headset. Jabra realized this and forged a partnership with Klipsch, one of the best speaker designers around.

The result of this collaboration is the cobranded Jabra S5010, a powered speaker dock that works with just about any music device, from an iPod to a mobile phone to a PC. The speakers are the most important factor in this equation, and Klipsch's deliver plenty of bass and far better highs than Cambridge SoundWorks's portable PlayDock Zen ($200). But for the money, we think Creative's surprisingly good GigaWorks T20 speakers ($100) are a better sonic value.

The dock is equipped with a mini USB port that's supposed to charge any device plugged into it, but it didn't work with our Creative Zen Vision: M, and we couldn't find mini USB cables that were compatible with our video iPod or BlackJack smartphone. We couldn't play music from the BlackJack either because the phone has a nonstandard headphone jack and we didn't have an adapter.

Removable neoprene panels in the cradle and on the back of the dock hide a bay containing a 2.5mm audio jack and the aforementioned mini USB port. The panel has notches on three sides and a hole in the middle to allow cables to emerge, and the bay is large enough that you can coil unused cable inside it. Jabra provides one cable with a 2.5mm stereo plug on one end and a 3.5mm stereo plug on the other, one cable with stereo 3.5mm plugs on both ends, and a cable with mini USB plugs on both ends. But when you plug in the USB cable, its L-shaped head blocks the 2.5mm stereo jack. Doh! Fortunately, there's a 3.5mm stereo jack on the back of the cabinet.

The S5010 doesn't sound bad enough for us to slam it, but it doesn't sound good enough to warrant a recommendation, especially with the connector annoyances.

—MICHAEL BROWN

S5010 SPEAKER DOCK **7**

$150, www.jabra.com

Razer ProTone m100 Earphones

Better than your average buds

At the risk of damning Razer's ProTone m100 earbuds with faint praise, these $40 earphones are many times better than whatever came with your MP3 player.

MP3-player manufacturers bundle such crappy earbuds with their products that we sometimes wish they'd put *nothing* in the box and credit the savings to the price of the player. But then we come back to Earth and realize that those buds are so utterly cheap that omitting them would likely save us only a buck or two.

If you're still suffering with factory earbuds because you can't swing the lofty price tag of M-Audio's IE-20 XB reference earphones, Shure's E4gs, or another high-end product, give Razer's ProTone m100s a listen. They don't approach the sonic heights of our favorites, but they'll set you back only 40 bucks—and the package includes an attractive nylon carry pouch and an airline adapter.

The m100s have plenty of bottom end, but it's not the tight, punchy bass that makes you boogie to the beat. While auditioning these buds to the sound of Tower of Power's power-funk classic "What Is Hip?" we noticed how the unrelenting series of sixteenth notes from Rocco Prestia's electric bass blurred together because the earphones just couldn't keep up. But we'd rather have a bit of boom and bloom to our bass than no low-frequency response at all, as is too common with cheap earphones.

The m100s proved more adept at delivering high frequencies, especially with instruments in the upper registers (we're thinking of the trumpets and alto sax in Tower of Power's almighty horn section). You will want to monitor your volume levels, however, because certain frequencies cut through the mix like a knife. While we were listening to "Down to the Nightclub," Dave Garibaldi's three high-hat accents came through with enough energy to shred our eardrums. This will be less of a problem if you're listening to compressed MP3s as opposed to losslessly encoded tracks because those high frequencies will roll off much sooner.

Since the m100s fit in your ear canal (you can choose from three plug sizes), they do a good job of isolating outside noise. All things considered, these earphones deliver plenty of bang for the buck.

—MICHAEL BROWN

RAZER PROTONE M100 **8**

$40, www.razerzone.com

Headset Hullabaloo

Three headsets enter the ring, one barely crawls out

The Tritton AX360's machined-aluminum earcups are attractive, but the earmuffs on the other side have an annoying tendency to fall off.

A great headset must not only deliver great-sounding music, dialogue, and sound effects, but also be capable of capturing the human voice with a mic that can distinguish between a subtle whisper and undesirable breathing noise while also rejecting extraneous environmental sounds *and* remain comfortable over long stretches of time. Few headsets do all these tasks well.

—MICHAEL BROWN

THEBOOM QUIET

We generally don't like headphones that use active-noise cancellation because these devices mask external noise by producing noise of their own. But we decided to make an exception for theBoom Quiet because of the lofty promises the company makes for its noise-canceling mic.

The headphones do a superb job of screening out fan noise, but that telltale noise-canceling hiss is there when you aren't listening to any other audio. Worse, theBoom Quiet is dull as dishwater, musically speaking: These headphones exhibit very limited dynamic range.

The mic, on the other hand, is easily the best of the three we tested. It made the best recording of our voice, and it did an extraordinary job of rejecting extraneous noise from nearby case fans and our own boisterous keyboard taps. This headset is extremely light, in spite of its rugged construction, and proved to be very comfortable during several hours of gaming. But for this kind of money, you should be able to get it all.

TheBoom Quiet has a handy volume control and inline mute button on its cable.

TRITTON AUDIO XTREME 360

Tritton's headset delivers true surround sound, just like the Turtle Beach Ear Force HPA2 we recommended in June. It also offers a feature that the HPA2 doesn't: a powered Dolby Digital decoder module with optical and coaxial digital inputs, plus a port for plugging in a second set of Tritton headphones. Cool!

This feature renders the AX360 useful for watching movies on a DVD player or gaming on a console system, but it doesn't do much for PC use. Tritton provides an analog adapter cable, so you can plug the headset directly into your soundcard, but the AX360's mic isn't as good as the HPA2's, and it's leagues behind theBoom Quiet in terms of rejecting background noise. The Tritton also can't match the HPA2 in terms of audio fidelity in music, movies, and games, but it sounds far better than the BQ and the utter waste of plastic that is the Genius.

Surround-sound support is a welcome feature, but the Turtle Beach product bundles it in a better package.

GENIUS HS-04U

The Genius HS-04U plugs into your PC's USB port, instead of your soundcard's analog speaker output and mic input, so it bypasses any EAX or OpenAL audio effects that game developers might have painstakingly programmed into the software. What you get instead—after installing a driver—is what Genius calls "Virtual Dolby."

We're assuming Genius meant to say "Dolby Headphone" because the packaging bears Dolby's trademark Double-D-and-headphone symbol (accompanied by the phrase "Dolby headphone certificate," no less). To our knowledge, there is no such thing as Virtual Dolby, but it doesn't matter because this headset sounds like crap. As for Genius's claim that its noise-canceling mic is "military grade," well, our voice did sound as though we were serving a tour of duty onboard a submarine.

The Genius HS-04U is made of plastic, but it sounds like tin.

THEBOOM QUIET

6

+ BOOMIN' BASS
Fantastic noise-rejecting mic, extremely comfortable, solid construction.

– BOOMIN' BAGHDAD
Limited range, especially at the high end; overly expensive for the musicality it provides.

$275, www.boomquiet.com

TRITTON AX360 HEADSET

7

+ THIN LIZZY
Comes with a Dolby Digital decoder that supports two sets of headphones.

– LIZZY BORDEN
So-so sound, sloppy construction.

$120, www.trittontechnologies.com

GENIUS HS-04U

4

+ GENIUS
In-line volume control and a mute button.

– IMBECILE
Lousy sound, even for cheap headphones; the mic is worse.

$50, www.geniusnet.com

Accolade Duet Projection Screen

Epson lets you have it both ways

Your current video projector has a 4:3 aspect ratio, but you're planning to move up to a high-def model with a 16:9 aspect ratio next year. In the meantime, you need to replace your projection screen, which your two-year-old recently mistook for an artist's canvas. Quite the pickle, eh?

Epson has an easy solution for your dilemma: Its unique Accolade Duet projection screen can deliver either aspect ratio from the same package. Instead of unrolling up or down from a horizontal position, the Duet is vertically oriented and opens to the left and right. Open it (one-handed) to the first position and it becomes a 65-inch screen with a standard-definition 4:3 aspect ratio; open it to the second position and it's an 80-inch screen with an HD aspect ratio of 16:9.

The screen fabric is a typical matte white and can be washed with a rag moistened with water. In our test environment, the Duet was slightly less reflective than our Draper Piper portable screen, but it exhibited excellent off-axis viewing, which is important if you're entertaining a large audience that can't all be seated directly in front of the screen.

The Duet's screen clips onto its tripod stand, so you can carry both items as a single unit, but you won't want to lug it far: It weighs 27 pounds (more than twice as much as the Piper). The tripod contributes to a rather large footprint: 33 inches deep by 37 inches wide. If you need to keep the screen closer to your wall, you can mount it there—Epson provides the necessary hardware in the box. You can still close the screen when it's mounted, and you can take it off the wall and again pair it with the tripod to take your show on the road.

The absence of support in the center of the screen could cause it to sag over time.

The fact that the Duet is $100 cheaper than the Piper makes up for the fact that it's not quite as bright; in fact, we think we've found our new favorite projection screen.

—MICHAEL BROWN

ACCOLADE DUET **9**

$250, www.epson.com

MAXIMUM PC KICKASS

Toshiba TDP-FF1AU Video Projector

Now we understand how it can run on batteries!

With apologies to the Beach Boys, wouldn't it be nice if there were an inexpensive video projector that was small enough to fit in the palm of your hand yet capable of throwing a 68-inch image? And while we're dreaming, how about giving it the option of operating on a Li-Ion battery. Oh, wouldn't it be nice?

Toshiba's go-anywhere TDP-FF1AU delivers on much of that dream. There's just one crushing problem: This projector is about as bright as a black hole. OK, maybe that's too harsh, but with a brightness rating of just 400 ANSI lux, you'll need a room that can be darkened to pitch black in order to be satisfied with this tiny device's output.

If you can't do that, you'll want a projection screen with both high contrast (in order to enhance the display of black and other dark colors) and high gain (in order to achieve maximum brightness). High-contrast screens, however, typically have negative gain ratings. This is because they use gray or silver fabric, which renders dark areas of the image closer to black while keeping bright areas of the picture about the same as they would be when displayed on a matte-white screen.

Toshiba bundles a rigid 23-inch tabletop screen with the projector, which is manufactured with a high-gain silver coating on its display side. It proved capable of reflecting an image in a room darkened only by miniblinds, which is something neither our usual Draper Piper test screen nor Epson's Accolade Duet (reviewed above) could do. Toshiba's screen, however, is really useful only for business presentations: It folds up to fit in the included carry bag, but a vertical seam right down the middle of it remains visible when in use.

A tiny footprint and an ultra-quiet cooling fan are among the few upsides to this DLP projector's dim image.

As a business tool, we think Toshiba's projector is a better value than the more than twice-as-expensive Casio XJ-S35 we reviewed in May (which is also powered by DLP technology), but we can't recommend it for home-theater or gaming applications unless you can absolutely darken your media room.

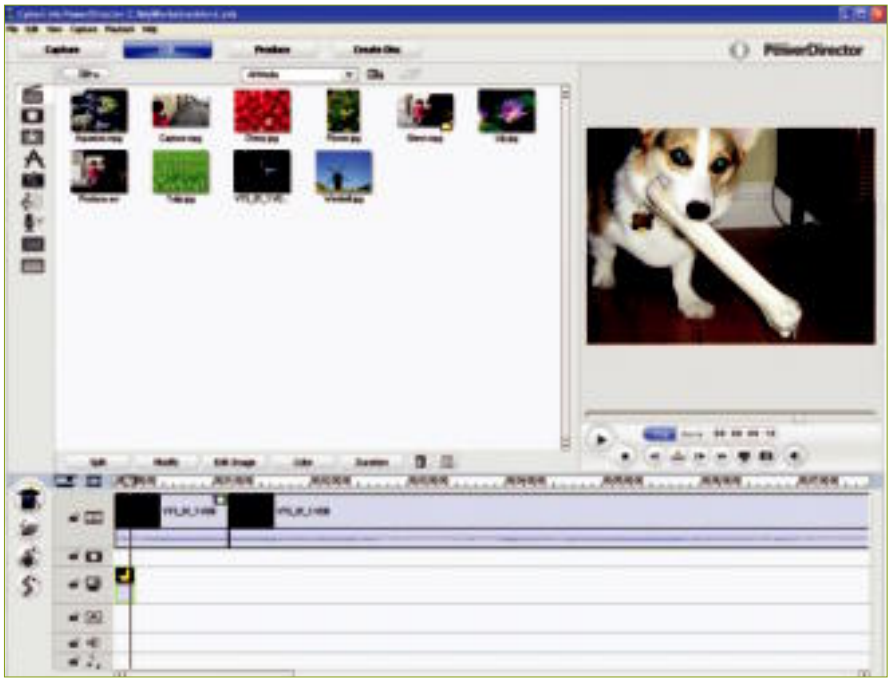
—MICHAEL BROWN

TDP-FF1AU PROJECTOR **7**

$700, www.toshiba.com

CyberLink PowerDirector 6

Powerful yet constrained



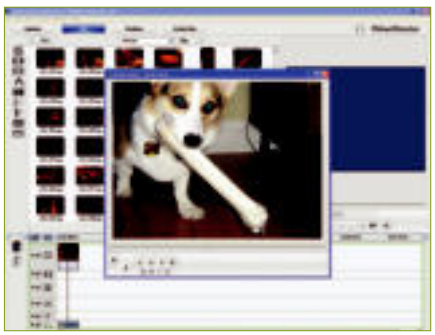
We found PowerDirector 6 better than its competitors at handling commercial VOB files.

PowerDirector 6's powerful features are handcuffed by a mildly frustrating interface. Unfortunately, the app just won't let you easily tweak things, which is strange because the product seems aimed at pleasing the button-mashers.

CyberLink embedded a simple process that allows users to upload rendered videos straight to YouTube, so you can tell who the company is marketing this product to. We easily uploaded a slide show we created using a wizard, though we did encounter some problems with this featurette.

In addition to one-click (well, three) uploads of your YouTube feature, PowerDirector 6 includes a host of pleasing video effects, but again, the clumsy interface forces you to hunt around for the proper controls. If you apply an effect directly to a video in the timeline, you can't simply right-click on the track to remove it. You have to select the track, hit the Effect button, and uncheck all of the effects you don't want to see.

It's a minor quibble, but we struggled with the interface more than we expected to with a product that should be user-friendly. The updated slide-show wizard, in particular, annoyed us. If you autocreate a slide show but don't like the result (for example, everyone's head is cropped off), you can't easily modify the slide show to fix the problem. The only thing you can do is keep applying different templates to see how they look—and that's a multistep process. It's almost as though CyberLink gets paid by the click.



The auto slide show tends to cut off people's heads but offers no easy way to correct this problem.

But enough about the bad stuff. The software does include some pretty neat features, such as the PiP effect, which lets you easily move a still image or video across the screen. There's no key-frame ability, but the method CyberLink uses to move, rotate, and resize objects in a video is probably easier for newbies to understand. And honestly, do you really need to key-frame the thought bubble over someone's head in your *Blind Date* spoof video? It's also worth noting that the subtitle engine can import .SRT subtitle files. Unfortunately, subtitles can't simply be turned on or off; they're rendered directly into the video.

HDV editing is now included as well. We captured video from a Canon HV10 HDV camcorder in PowerDirector 6 with no hitches. Although one of the primary scene-detection methods did not work for us, post-capture scene detection effectively diced up our video for us. That's certainly better than Adobe Premiere Elements 3.0, which doesn't preview HDV video capture or have any post-capture scene detection. Likewise, Pinnacle's Studio 10.7 requires that you activate scene detection. It doesn't cost anything, but we shouldn't be subjected to the hassle. One of PowerDirector 6's weaknesses is how it exports HDV video. You can create an AVI file at high res or output it back to tape, but that's it. There's no Blu-ray or HD DVD disc support nor a way to master the disc so that it will play on an HD DVD deck using a standard single- or dual-layer DVD encoded at a higher resolution.

PowerDirector 6 does excel in VOB editing of commercial discs. While Adobe Premiere Elements 3.0 is unreliable in its handling of commercial VOB files and Pinnacle Studio 10.7 has issues, PowerDirector 6 easily imported a VOB file ripped from a commercial disc. That's of great value if you want to recut *The Godfather: Part III* to remove all of Sophia Coppola's scenes.

Whether PowerDirector 6 is for you depends on how far you want to go. If you want a quick-hit editor, it has more than enough to keep you happy. If you expect to get a little more medieval with your edits, you'd be better served by Pinnacle Studio 10.6.

—GORDON MAH UNG

POWERDIRECTOR 6

MICHAEL CORLEONE
Best program for VOB handling and subtitle support.

MARY CORLEONE
Awkward button placement.

7

$90, www.cyberlink.com

Expensive Music-Making

Making your own jams is an awesome, and awesomely expensive, hobby

Hey there, you fancy musically inclined person, you. We've reviewed a few bare-bones, low-priced music apps, and now it's time to tackle the big guns. Yes, that's right. These programs will set you back a pretty penny—60,000 pretty pennies, in fact. They have everything the budding composer or aspiring DJ needs, but are they worth the cash for the average Janes and Joes of the computing world?

—DAVE MURPHY

Editing a track in Ableton Live 6 can be as simple as mixing and matching blocks of loops.

FINALE 2007

Staff paper be damned, we say. This Beethoven-in-a-box is one of the most popular music-creation utilities available for the Windows platform, and it's easy to see why. A nigh-limitless level of helpfulness and customizability has existed throughout Finale's many incarnations, and the 2007 edition of the score-creator ups the ante even further. The program not only blends elements of sound-board mixing directly into its notation interface but also comes with a large collection of helpful videos—gone are the days of having to scour through PDF help files just to figure out the basics.

Our biggest criticism of Finale, aside from its outrageous price, is that the program hardly seems like much of an upgrade from Finale 2006. Granted, Finale 2007 includes the awesome Garritan Personal Orchestra, which gives you way more realistic MIDI sound than your standard MIDI samples. Still, Finale 2007 is what Finale's always been—same ol' interface, same ol' note input. Only now, you get to contend with slowdown and finicky stability as a result of the extras.

As a stand-alone product, you really can't get much better than Finale 2007, but only if you're a first-timer to the experience. Composition noobs and people who just want to transcribe "Brick" might best benefit from Finale's less feature-soaked (and one-third cheaper) cousin, Allegro.

FINALE 2007

8

ROCKING THE SUBURBS

It couldn't be easier to create music in any shape or form you want.

ROCKING THE FARM

Taking out a second mortgage just to make piano jams isn't very fun. Go find a cheap copy of Finale 2006.

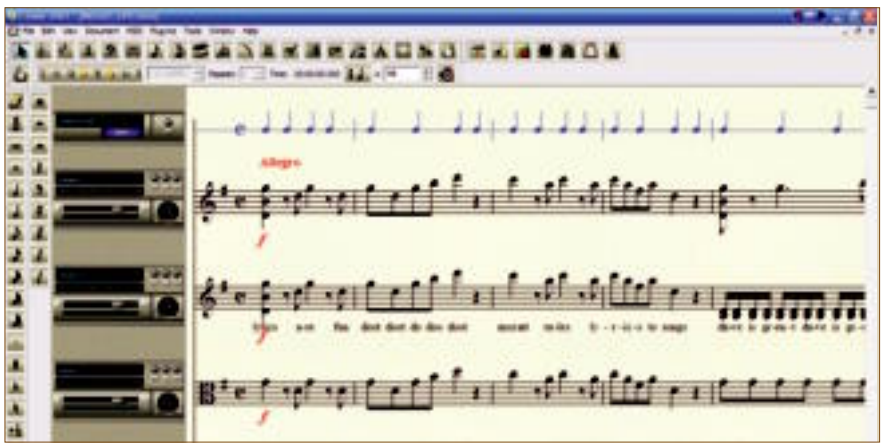
$600, www.finalemusic.com

ABLETON LIVE 6

You can do so much with Live 6, it's hard to know exactly where to begin describing this masterful software sequencer. So we'll start at the top. With just a few clicks of an in-application help system, we were up and running with the program's Operator add-on, creating notes and beats that sound as though they were pulled straight from a Keith Schofield music video. Awesome.

While the program references a number of functions that are a lot to swallow for a beginner—filter frequencies, resonances, waveshapes—the simple interface encourages the ol' "try it" approach to learning the program. That said, audio enthusiasts will find plenty of opportunity for experimentation under Live 6's hood: You can create your music using a MIDI-attached keyboard, directly edit the MIDI notes within your loops, and then change up your beats with a ton of plugin-style effects.

Live 6 would benefit from a better navigation system to simplify accessing its many functions, and the drab gray program needs some Apple interface treatment. But these are paltry concerns for such a sweet, learner-friendly music application.



If only history's greatest composers had had access to Finale 2007's music tools.

ABLETON LIVE 6

9

LIGHT-SWITCH RAVE

Fun to tinker around with, even if you have no audio-creation experience whatsoever.

PACIFIERS

Could stand an interface overhaul; a few more tutorials would be nice.

MAXIMUM PC KICKASS

$600 box, $500 download
www.ableton.com

The Elder Scrolls IV: Shivering Isles

Oblivion with a healthy dose of laughing gas

Most of us at *Maximum PC* really dug Oblivion—some of us could do little else until we'd "finished" it, including sleep, eat, shower, or hit our deadlines…. When it was finally over, we went through a little withdrawal depression—there just wasn't another game out or even on the horizon that appealed to us as much.

We dabbled with fan-created add-ons and some of the game's pay-to-play content, but they barely scratched our exploration itch. Finally, the first official expansion is here, and it was worth the wait.

In Shivering Isles you gain entrance to the Realm of Sheogorath—the stomping grounds of the particularly nutty Daedric Prince of Madness—and defend the land from "certain destruction." OK, so the role of champion isn't exactly new, but the landscape certainly is. Sheogorath is unlike anything we saw in Cyrodiil, and even at one-quarter its size, there's a lot to see.

Not only are the flora and fauna of Sheogorath unique, but so too are its denizens. Sheogorath is generously populated with new NPCs, quests, subquests, and baddies looking to split open your skull with their axes, swords, arrows, and other implements of destruction. The main quest took us about 20 hours to beat, and there's about another 10 hours of "smell the roses" content tossed in for those that like to take the scenic route. You can play the game with a new character or tackle it with your existing hero—either way, the game will adapt to match your skill level.

Sheogorath is resplendent with detail and chock-full of impressive-looking (but not so tough) baddies to keep your sword-arm swinging.

Well, almost. Aside from one nasty fight, the new content's a bit too easy. (If you're looking for a challenge, it's probably best to create a new character.) The add-on is really more about dialogue and politics than unbridled brawling, which might not be for everyone. And there's not enough high-level kit to be found, either.

However, the writing for this expansion kept us entertained throughout the adventure. The scads of laugh-out-loud moments in this add-on again made personal hygiene optional until we finished our quest.

—STEVE KLETT

SHIVERING ISLES **8**

$40, www.theelderscrolls.com
ESRB: M

Infernal

The gaming equivalent of a David Goyer action movie

You never want to get on the bad side of God, especially when you're one of his elite angels. That's what happened to Ryan Lennox (who bears more than a striking resemblance to Ryan Reynolds), the rugged protagonist of Infernal. You step into his forsaken boots as a fallen angel who is looking for redemption—but still isn't afraid to kick ass and take names. After signing a contract with the devil, you'll do dirty work for both good and evil, smiting rogue monks, heretics, and other supernatural menaces in this single-player-only fragfest.

The game takes you through monasteries, ironworks, and even an aircraft carrier—varied locations that ensure you won't notice the repetitive action. The fast-paced gunfights take a cue from other established third-person shooters: We jumped, dived, and circle-strafed while blasting away at an endless supply of gimpy minions. Infernal even has a unique gameplay gimmick—using built-up mana power, you can unleash a hellfire attack that dramatically augments your current weapon. We also dug the ability to harvest souls, which gives you upgrades and lets you reclaim health.

The game's pace is hindered only by its mazelike levels. We felt very restricted within the confined space of the maps and got bored with the countless puzzles requiring us to find keys and alternate routes through passageways. Even worse, we found ourselves occasionally stuck between objects while using the game's cover system. There's no harsher punishment than being trapped in a dark hallway, stuck to a barrel while goons spew vulgarities at you from afar.

When it comes to shooting and killing, Infernal doesn't disappoint.

Though not as effective as the no-look punch, the no-look shot is still pretty flashy.

Mercenaries and mini-bosses were no pushovers—we needed to score head shots and use cover to avoid losing our own noggin. The game includes plenty of exciting weapons, ranging from RPGs to plasma rifles, and everything gets kicked up a notch when you enable hellfire. Soft bloom and subtle lighting effects had us convinced that the developers went all out with the visuals. Too bad we can't say the same about the gameplay.

—NORMAN CHAN

INFERNAL **7**

$40, www.infernalgame.com
ESRB: M

WIN Rig of the Month

If chosen, your rig will be featured before all the world in Maximum PC—and you'll win a $500 gift certificate for Buy.com

TO ENTER: Your submission packet must contain your name, street address, and daytime phone number; no fewer than three high-res JPEGs (minimum size 1024x768) of your modified PC; and a 300-word description of what your PC represents and how it was modified. Emailed submissions should be sent to **rig@maximumpc.com.** Snail mail submissions should be sent to Rig of the Month, c/o Maximum PC, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080.

The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) October 15, 2007, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the December 2007 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future US, Inc. may use your name and your mod's likeness for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future US, Inc. is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future US, Inc. c/o Maximum PC Rig of the Month, 4000 Shoreline Ct, Suite 400, South San Francisco, CA 94080. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

We tackle tough reader questions on...

PCs in the Lab ✓Gaming on Linux ✓F-22 Software ✓Geek Quiz Error? ✓Turntables

BY THE POWER OF GRAYSKULL!

How many PCs are running in your Lab at any given moment? Inquiring minds want to know.

—Tony

Dave "To Hell with the Environment" Murphy responds: Since Gordon is busy having a kid right now, we're wasting a little less electricity than normal. To counteract the carbon reduction, I'm currently setting forest fires and clubbing baby seals with three active rigs. Katherine is but a mere litterbug with one computer, though she rolls with two or more monitors all the time. We'll upgrade her to "dumping toxic waste." Michael sends batteries to the landfill with just one computer, and Will is doing his best to fight global warming by keeping all of his machines in a pristine, unplugged conditioned. Quoth him, "The Power is Yours!" All told, the Lab PC count is five.

LINUX IS FOR GAMERS

I have to take issue with your article "Get Started with Linux" (June 2007) even though it did show a lot of what Linux can do. In particular, I disagree with what you term a "limited amount of games." I will admit that I have OpenSuse and not Ubuntu and the number of games available might seem limited in terms of what's available in the Windows world, but 110 free games came loaded with my system. There are solitaire games, Tetris-like games, and more, so I would dispute that the term "limited" really applies in this case.

—John Meyer

EDITOR IN CHIEF WILL SMITH RESPONDS: Well, I guess Linux's gaming viability depends on what you consider a game. Not to knock any of our more casually oriented gamer brethren, but when I knocked Linux for its lack of games, I was specifically thinking of high-end AAA games like Half-Life 2, Supreme Commander, and World of Warcraft. I wasn't thinking about the Game of Life or Minesweeper clones.

SHHH, THEY'LL GET TO US TOO!

I just read your guide to copying and converting media in the May 2007 issue and thought I would share two observations regarding some of the software mentioned.

As of March 31, the RipIt4Me website has been closed and development of the program has been discontinued, and as of April 19 the same goes for FixVTS. No clear reasons or explanations were given for the shutdowns.

—Julian Betances

EDITOR IN CHIEF WILL SMITH RESPONDS: Here's the scoop: The folks who built those two apps were cease-and-desisted by persons unknown mere days after we went to press. The good news is that the apps are still available; you'll just have to use Google to find them. The bad news is that this almost certainly means the end of development for both of those apps. The source code wasn't available when they were shut down, and the involved parties are almost certainly prohibited from even discussing the apps, much less releasing source code.

However, it's not all bad news. To paraphrase Jeff Goldblum's goofy character from *Jurassic Park*, hackers find a way. They always find a way.

THE ONLY GEEK QUIZ COMPLAINT LETTER WE RECEIVED THIS YEAR

I have a quick comment about your Geek Quiz article (May 2007). You state that tip-ring-sleeve audio connectors are mono and stereo. This is not true—tip/ring/sleeve (TRS) connectors are stereo and tip/sleeve (TS) connectors are mono only. The ring is what allows for the second audio channel to be transmitted.

—Tim Henderson

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: I agree that most TRS connectors are stereo: The tip is used for one channel, the

CUTCOPYPASTE

In the June 2007 issue, we inadvertently listed the Ubuntu Linux distro's homepage as **www.ubuntu.org**. In fact, it's **www.ubuntu.com**; sorry for the inconvenience.

The Real Problem with F-22s

I read Mr. Halfhill's May 2007 column ("Multithreaded Booby Traps") with interest. I have sad news for him regarding the headings 180 East and 180 West. 180 is the only heading which is purely south and no other cardinal direction—always, no exceptions. The F-22 error took place when the aircraft crossed the International Date Line, which is 180 degrees longitude. The aircraft went from 180W longitude to 180E longitude. The software engineers should be embarrassed.

Trust me.

—David McDonald
Lt Col, USAF Reserve (R) (that means very retired)

used for a second channel, and the sleeve is used for ground. But there are also monaural TRS connectors that are used for balanced lines. In this case, the tip is used for an in-phase signal, the ring is used for an inverted copy of the same signal (i.e., out-of-phase), and the sleeve is used for ground.

When the signal carried on a balanced connection reaches its destination, the out-of-phase signal is flipped and added to the in-phase signal. Any noise that made its way into the signal is also inverted and therefore cancelled. Balanced lines are much less susceptible to hum, so they're typically used to carry audio signals over long distances.

TURNTABLE TURNABOUT

The information in your turntable reviews (May 2007) was good as far as it went, but you should have consulted with someone who has actually used an original turntable on some original records. It is important to know what speeds those turntables support because unlike CDs, records come in several different speeds: 16, 33 1/3, 45, and 78 revolutions per minute. Leaving this information out makes the rest of the report meaningless. If one of the turntables supports all those speeds and the other does not, then all other specifications quickly lose their relevance.

—Bill Stadelman

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: Thanks for your feedback on the turntable reviews. Due to space constraints, we have to prioritize the facts we include in our reviews. As I said in the opening, anyone who's truly serious about vinyl records will dismiss these products as toys. But you're right, I should have been more explicit in stating that both these tables are limited to 33 1/3 and 45rpm instead of mentioning LPs, EPs, and 45s and assuming that the reader would then deduce that neither product is capable of running at 16 or 78rpm.

CONSOLE AGNOSTICISM

I was dismayed (to put it mildly) when I pulled back the cover of June's issue to find an ad for an Xbox 360 game on page one! I am STILL disgusted that COD3 is available for every platform, except the PC! Stalker was a welcome breath, but I'm seriously starting to wonder where this is leading! I know it's difficult (if not impossible) to pick and choose your advertisers, but you seem to be ignoring your own philosophy! The PC hardware manufacturers who are catering to the "horsepower for gaming" crowd are simply going to die off if the games don't materialize. We have no reason to upgrade unless there are games and apps that make the newer equipment necessary or desirable, and that would render your magazine irrelevant!

—Steve Bachman

EDITOR IN CHIEF WILL SMITH RESPONDS: There are actually two things for me to talk about here, Steve. The first is that the editorial staff of the magazine has absolutely no control over the products that are advertised within these pages. We assiduously guard the boundary between editorial and advertising so that we can deliver an editorial product that's completely untainted by advertising. We don't know what products are being advertised until we get the issue, just like you. This is as it should be, and it's what allows us to continue delivering a top-notch editorial product to you every month.

The other part of your letter is about the larger (and almost completely useless) battle between console and PC gaming. PC gaming is bigger now than it ever has been before. There are housewives in the Midwest playing World of Warcraft, Microsoft's spending a ton of money promoting the PC as the fourth main gaming platform, and most of the really interesting innovations right now are happening in PC gaming. As always, there are games that play well on the PC and games that play well on consoles. And increasingly there are games that play well on both. Shadowrun is one such game—and it will launch with cross-platform multiplay between Xbox 360 and PC players.

What's the practical upshot? When Shadowrun comes out, you'll finally have a healthy outlet for all your anti-console rage. All you'll have to do is fire up the game and frag the console weenies (you can recognize them by the sloooow way they turn and their pathetic aiming skillz). MPC

LETTERS POLICY: *MAXIMUM PC* invites your thoughts and comments. Send them to **input@maximumpc.com.** Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

COMING NEXT MONTH IN MAXIMUMPC'S

DOUBLE-STUFFED CRUST AUGUST ISSUE

MEDIA CENTER ROUNDUP

Is the time right for a living-room PC? We'll look at several new prebuilt media center machines to see how the category has evolved and whether your TiVo will soon be out of work.

PUT YOUR PC TO SLEEP

No, we're not suggesting that you euthanize your computer. We will show you how your PC's S3 Standby mode can cut your energy costs without hampering performance.

VISTA GRIPES FIXED

By now, everyone can agree that Vista has some issues. We'll look at some of the common complaints about the OS and tell you how you can fix your problems with Vista.

JOE AND JESSE NUZZO'S

Vader ITX

We're not much for console gaming, but we do have fond memories of running home after school to play Atlantis, so we were excited to see the Nuzzo brothers' rig—and even more excited to hear that they didn't have to sacrifice an Atari 2600 to create it.

A friend of Joe and Jesse bought out a pawn shop's entire video game supply—thousands of games and a few dozen systems—and part of the haul was an empty 2600 shell, so the brothers didn't have to destroy a working system to create this rig.

After a few missteps (PSU issues and a fried hard drive—hey, things happen!) the guys got on track and built up this rig based on a mini ITX board. A 2.4GHz P4 is the brains behind this beast that also includes 512MB of DDR RAM.

And just what do the Nuzzos use this rig for? Playing old arcade games like Golden Axe and Final Fight, of course!

Why is this rig called the Vader ITX? Old-school gamers know that the all-black Atari 2600 was commonly referred to as the Darth Vader model.

Like our car, the entire back of this case was reshaped and rebuilt with Bondo and pieces of plastic taken from old monitors.

The multicolor glow emanating from inside the rig was created with UV-reactive spiral-wrap and UV lights.

To get this just-off-the-shelf look, Joe and Jesse repainted the case with both high-gloss and textured paint.

For their winning entry, Joe and Jesse Nuzzo win a $500 gift certificate for Buy.com to fund their modding madness! See all the hardware deals at www.buy.com, and turn to page 101 for contest rules.

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

MAXIMUM PC (ISSN 1522-4279) is published monthly by Future US, Inc, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080, USA. Periodicals postage paid in South San Francisco, CA, and at additional mailing offices. Newsstand distribution is handled by Curtis Circulation Company. Basic subscription rates: one year (13 issues) US: $20; Canada: $26; Foreign: $42. Basic subscription rates "Deluxe" version (w/CD): one year (13 issues/13 CD-ROMs) U.S.: $30; Canada: $40; Foreign $56. US funds only. Canadian price includes postage and GST (GST#R128220688). Postmaster: Send changes of address to Maximum PC, P.O. Box 5159, Harlan, IA 51593-0659. Standard Mail enclosed in the following edition: None. Ride-Along enclosed in the following editions: B1, C1, C2, C3, C4. Int'l Pub Mail# 0781029. Canada Post Publications Mail Agreement #40043631. Returns: 4960-2 Walker Road, Windsor ON N9A 6J3. For customer service, write Maximum PC, P.O. Box 5159, Harlan, IA 51593-0659; Maximum PC, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080. Future Network USA also publishes PC Gamer, PSM, MacLife, and Official Xbox.