Reviewed! Next-Gen GPU
Can the Radeon HD 2900 XT beat the GeForce 8800 GTS?

How H_2O Cooling Works
What you must know about the laws of thermodynamics

Media Center vs. TiVo
Which will win our brutal PVR battle royale?

MAXIMUM PC

MINIMUM BS • AUGUST 2007

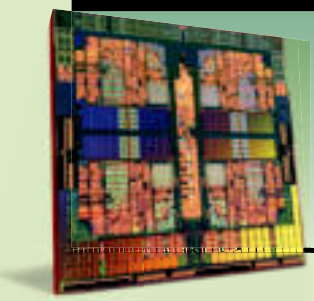
Maximum PC Presents the Ultimate

POWER USERS GUIDE

TO BECOMING A POWER USER

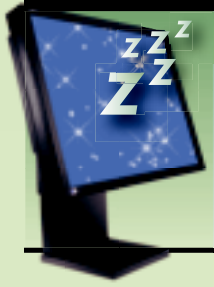
29 Kick-Ass Tips & Tricks to Make You a PC Brainiac!

AMD's Athlon-Killer Revealed!



Will the new Phenom quad core smack down Intel's next-gen Penryn?

How to Save $300 a Year!



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FIX NAGGING VISTA PROBLEMS WITH OUR STEP-BY-STEP HOW-TO

Ed Word

Is Microsoft Serious About Games for Windows?

Please send feedback and steamed broccoli to ***will@maximumpc.com.***

Microsoft has been talking about Games for Windows for half a decade now, and the first two games that fully represent the promise of an easy, console-like multiplayer experience on the PC are available—Halo 2 and Shadowrun. We didn't get code in time to review these titles this month (we'll post both reviews online when they're done as well as in next month's issue), but I've spent more than a few hours playing both, and frankly, I'm concerned—these games have serious problems.

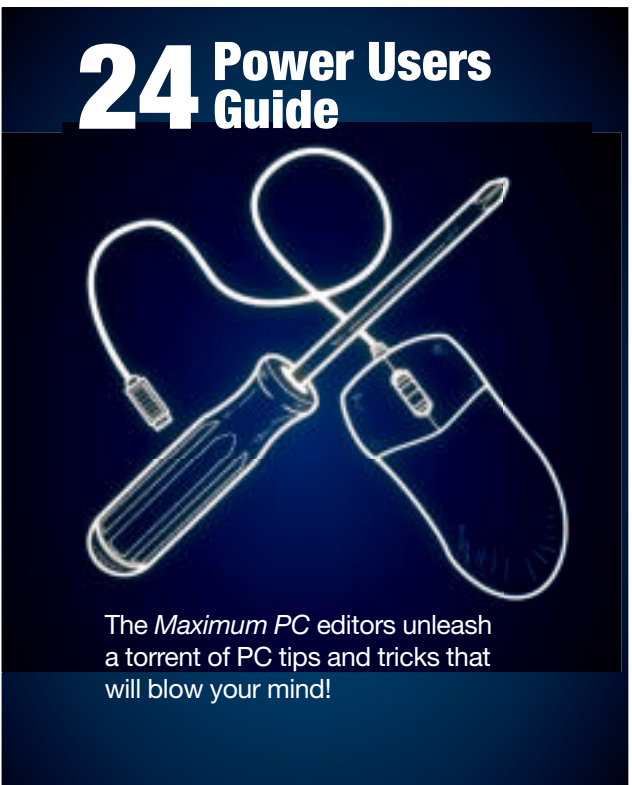
The promise of the Games for Windows effort is laudable: Redmond says it will deliver an Xbox Live–style friends list, seamless multiplayer, easier game installs, and even Microsoft marketing dollars spent to promote the PC as a gaming platform. The problem is that the entire initiative is tied to "gaming-friendly" Vista, which is not as gaming friendly as Microsoft hoped due to unstable, poor-performing drivers and spotty support for gamer must-haves like SLI and hardware audio.

But let's talk about the games. I'm not going to kvetch about the insanity of requiring Vista for Halo 2—a game designed to run on a Pentium 3/GeForce4-powered console with 64MB of RAM. It's silly, and everyone knows it. I am, however, going to complain about the developers pulling the feature that made Halo 2's multiplayer revolutionary—seamless party-based matchmaking. In Halo 2 on the Xbox, you form a party with your friends, and then the matchmaking system automatically matches your group with other groups with similar skills—all in the game type of your choice. The Vista version of Halo 2 doesn't work the same way, leaving you with the same tired in-game server browser we've used since Quake 2.

Shadowrun was to deliver on the Live for Windows promise of cross-platform multiplayer, pitting Xbox 360 gamers against PC players. Unfortunately, the game suffers from a host of Live-related problems, and it, too, is limited to Vista owners. Its buggy matchmaking works differently for PC and Xbox players, and signature Live features (like Achievements) work only sporadically. But the thing I really don't understand is why Microsoft would tie a new title to Vista, particularly if the company's goal is to sell as many games as possible.

When looking only at bugs, I think that Microsoft simply goofed on the implementation of Live on Windows, but when I look at the sales prospects for these titles, I'm beginning to wonder if these "missteps" are part of a larger strategy to drive gamers away from the PC.

Features



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The *Maximum PC* editors unleash a torrent of PC tips and tricks that will blow your mind!

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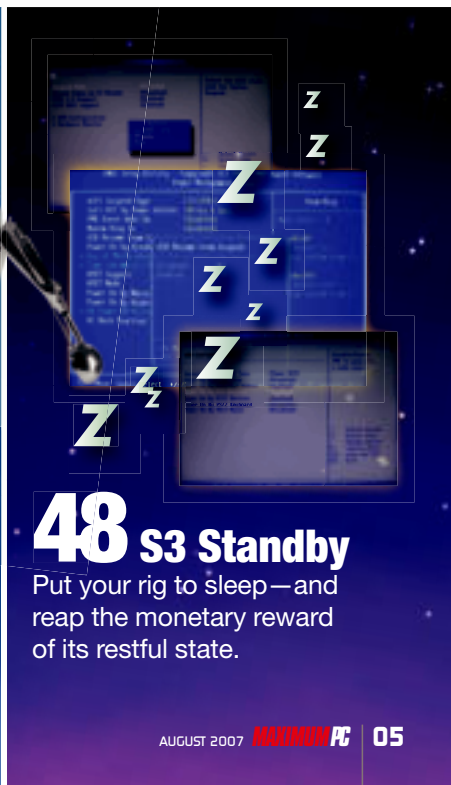

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MAXIMUM PC

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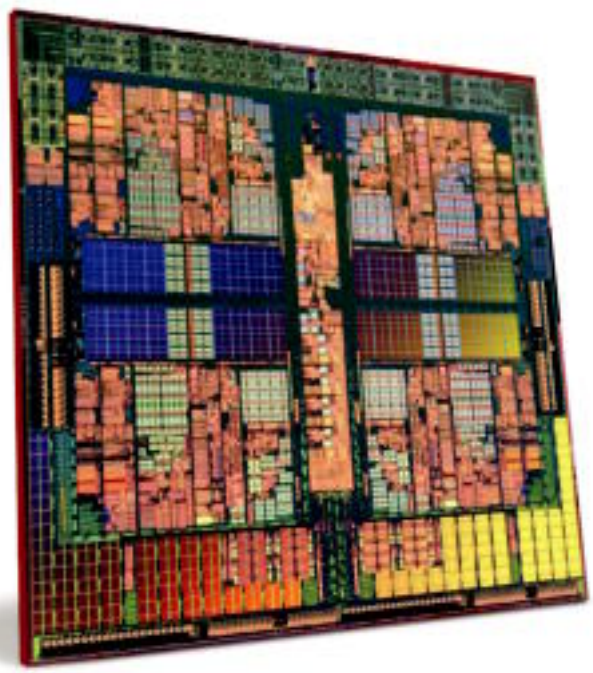
It's Phenom(enal)!

AMD ditches the Athlon 64 moniker for its next-gen top-end CPUs



The upcoming Phenom FX features four cores on a single die, as opposed to Intel's quad core, which fuses two distinct dual-core chips.

How confident is AMD that its next-gen CPU will be faster than anything in Intel's stable? Well, the company is willing to ditch the well-respected Athlon 64 name in favor of a new moniker: Phenom, as in phenomenal.

AMD's betting the farm that the evolution of Athlon 64 will have the chops to beat back Intel's recent success.

Although Athlon 64 is no more, the FX and X2 designations remain. At the top end, Phenom FX will feature the fastest-clocked CPUs in quad-core only, with the option of running Phenom FX in a dual-processor configuration for up to eight execution cores. Phenom FX versions will come in the Quad FX–platform Socket 1207 trim as well as Socket AM2. One step down will get you Phenom X4 and Phenom X2 parts in Socket AM2. Details are sparse, but these parts will likely be clocked lower and feature less cache than the FX versions. Existing Athlon 64 parts will be renamed sans the "64," which AMD feels has lost its meaning since Intel has long since added 64-bit extensions.

Phenom parts will be pin compatible with the majority of AM2 and Socket 1207 motherboards on the market, but there's talk of an improved version of the sockets called Socket 1207+ and Socket AM2+, which will feature the ability to run the CPU and north bridge at separate speeds to save power and enhance performance.

Phenom is essentially an evolution of the Athlon 64 core with a better DDR2 memory controller, enhanced virtual-machine performance, better power management, and SSE performance improvements. The company claims that floating-point performance, for example, should be quadrupled over Athlon 64. There's also a new L3 cache that's shared by all four cores. That's possible because of the Phenom's design, which AMD touts as being "true quad core."

While Intel constructs its Core 2 Quad chips by joining two dual-core processors that communicate via the relatively slow front-side bus, AMD designed a single contiguous die that lets all the cores communicate at much higher speeds than Intel's 1,333MHz FSB. AMD's new CPU, however, may be less efficient to produce. Because Intel uses the same essential cores for its dual- and quad-core procs, its production process is simplified. AMD will have to maintain separate production lines for its dual and quad versions. But the impact will likely be minimal because the Phenom will be based on the same 65nm process as Athlon 64. Next year, AMD expects to have its 45nm process online and a chip code-named Shanghai should be the first AMD processor to use it.

Of course, none of this really means anything if Phenom can't deliver, says PC industry analyst Rob Enderle of the Enderle Group.

"At the end of the day, the market where Phenom plays is about providing a lot of performance," says Enderle. "If the products are good, they will probably carry and establish the brand. If they are not and Intel continues to perform, then the only phenom will be the fact that they are not selling."

AMD'S NEXT-GEN LINEUP

	WHAT IT IS	SOCKET COMPATIBILITY
PHENOM FX	Quad-core only, with the largest caches and highest clocks of the consumer CPUs.	Socket 1207 and Socket AM2
PHENOM X2, PHENOM X4	Available in quad-core and dual-core versions with lower clock speeds and less cache than FX parts.	Socket AM2
ATHLON X2	Take existing Athlon 64 parts, whack off the 64, and you get Athlon X2.	Socket AM2

Wi-Fi on the Road

Avis offers broadband connectivity in its rental cars

Rental-car agency Avis has begun rolling out a new service for its customers who want broadband Internet along with their rental car. The Avis Connect service costs travelers $10.95 per day and consists of a mobile Wi-Fi device (pictured) that can be used in the car or carried into a hotel room, board room, or other locale. The device, made by AutoNet Mobile, provides Internet access over both 3G and 2.5G cellular networks and can be charged via either a car's cigarette lighter or a wall socket. AutoNet will soon be selling its portable Wi-Fi router through automotive dealers for $400, with a monthly service charge of $30-$50.

E-Strike on Estonia

Cyber attacks on a small Eastern European hamlet may serve as a warning to larger nations

Estonia, an incredibly tech-savvy country located on the Gulf of Finland, might be too advanced to stay safe: The Estonian government uses the Internet to have cabinet-level discussions, important documents are often signed by way of digital signatures, and Estonian citizens can even vote in national elections from their PCs.

That sophistication made Estonia all the more vulnerable when mystery perpetrators began bombarding the country's official websites with distributed denial-of-service (DDoS) attacks in late April. The attacks offlined many of the government-run sites, rendering the country's digital infrastructure unusable. At its peak, one onslaught disabled 56 sites at once.

While Russia, which has had tense relations with Estonia, is a suspect, officials from NATO and the European Union have been unable to uncover the roots of the attacks.

If any good has come from this bout of cyber warfare, it's that a spotlight has been cast on this new, potentially debilitating form of terrorism.

TOM
HALFHILL

Penryn Helps Intel's Comeback

As I predicted last year, Intel is recovering from its mistakes by introducing new processors that are much more competitive with AMD's chips. Meanwhile, AMD is suffering money woes again, but the scrappy company is developing some very interesting multicore processors with integrated ATI graphics. The coming year will be a great one for PC enthusiasts.

Intel is on track with Penryn, which improves the already-strong Core microarchitecture and shifts to the next-generation 45nm fabrication process. In addition to having smaller transistors, the new process will debut high-k metal-gate transistors, which I described in April. Along with other improvements, the new technology should make Penryn a winner.

You've probably heard about Penryn's SSE4. With 47 new instructions, it's the largest expansion of the x86 instruction set in seven years—even larger than the recent 64-bit extension. Digital video, 3D graphics, and scientific applications are driving the need for many of these new instructions. In some cases, programmers can replace a whole screen of code with a single SSE4 instruction.

The drawback? Programmers must use low-level assembly language to reap most of SSE4's benefits. Vectorizing compilers that do the work automatically are still immature. Some SSE4 instruction mnemonics (such as MPSADBW and PHMINPOSUW) are so confusing that I need mnemonics to remember the mnemonics.

Penryn-based mobile processors will have a new Deep Power Down mode that drastically reduces the voltage to minimize power leakage while a core is idle. The OS issues a command to force the core into this mode; another command restores the original state. I've been worried that buggy or malicious software could repeatedly trigger this mode, creating a power-thrashing race condition that effectively disables the processor. However, Intel assures me that a special timer prevents a core from entering this mode too often. (We'll see.)

Another Penryn feature for mobile processors is Enhanced Dynamic Acceleration Technology. Dumb name, clever idea. It temporarily boosts the clock speed of one core to handle extra work while another core is idle. This job-sharing prevents the idle core from having to power up to handle a small additional workload.

Overall, Penryn is a smart design with a mix of power-saving and performance-enhancing features. Sometimes little things add up to a lot.

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

GAME THEORY

THOMAS **MCDONALD**

The Road to Somewhere

I spent a year as the massively multiplayer columnist for another magazine and let me tell you: That was one loooong year. Perhaps it was because I *had* to play the games, but I came to see the whole genre as a giant time sump, trapping gamers on a road to nowhere with no end in sight, just an ever-expanding horizon of "additional content."

Though I swore you couldn't pay me enough to play one of the blasted things again, I checked into both City of Heroes and World of Warcraft long enough to get a pulse check, poke around, and see that (1) the road to nowhere was still lovingly paved, albeit now with prettier graphics, and (2) the games were still mightily impressive chunks of design positively overflowing with content.

See, the problem wasn't the MMOs, it was my expectations. Conventional RPGs always build to something. Sure, the journey to the end is part of the fun, but there is an end in a conventional RPG, and it usually involves some sense of completion and final accomplishment. MMOs, of course, can't end. They're simply… the journey.

Lord of the Rings Online finally convinced me that the journey is enough. Tolkien's work was about going "there and back again." It was about the trip, not the destination. Only the call of Middle-earth could get me into another MMO, so I signed up and joined a kinship of Catholic priests and laypeople called Veritatis Splendor. (RC literary types have an enduring affection for Tolkien, who described his great work as "fundamentally religious and Catholic.") When I paused after cleaving a Blue-crag Sapper in twain and saw kinship chatter about the new motu (shorthand for a specific, long-awaited papal document), I realized that many of my passions —Tolkien, faith, role-playing, and PC gaming, not to mention the sublime pleasures of Orc-kind cleaving, which are self-recommending—were colliding in one place and that this was only possible in an MMO.

As the man himself wrote, "the road goes ever on and on," and when the journey and kinship is as good as it is in LOTRO, that's all right by me.

Thomas L. McDonald has been covering games for 17 years. He is editor-at-large of Games Magazine.

A Silverlight on the Horizon

It's no secret that web media is largely an Adobe-dominated front. Look no further than the major multimedia sites that dot today's Internet landscape—the YouTubes, MySpaces, and other content portals that all rely on Adobe's Flash Player as the streaming conduit that connects content to eyeballs.

It's a large bit o' pie for the San Jose, CA–based software behemoth—one that's gained the attention of a few other industry players. Microsoft, ever the sleeping giant, has already begun its grand tiptoe into the web media world with the early April launch of its Silverlight .NET-themed web plugin.

The platform allows content developers to mix Windows Media Video and web applications in a consistent manner across both Macs and PCs via a browser plugin that's smaller than 2MB. One of the first applications to make it through the gate, in alpha testing at the time of this article's writing, is Popfly.

Eerily similar to Yahoo's Pipes application, Popfly enables users to tie together data streams from a number of external sources—Flickr, Google Base, and RSS feeds, amongst others. These feeds can exist independently of each other, or a user can elect to combine the elements into one overarching application. For example, you could layer information displays atop one of Microsoft's Virtual Earth maps to integrate driving directions with construction updates.

It's still too early to tell how big a dent Silverlight will make in the Flash fortress, but with Microsoft offering 720p video and cross-platform, cross-browser support, Adobe's on the receiving end of quite a hefty gauntlet.

Keyword: Cash Cow

The tech sector's biggest players are scrambling to stake their claims in online advertising. Yahoo grabbed Right Media, an online marketplace, for a mere $680 million in April—a return volley against Silicon Valley giant Google's purchase of DoubleClick that same month for $3.1 billion.

Not wanting to be left out of the fun, Microsoft acquired Aquantive in May for $6 billion—the purchase was the largest deal in Microsoft's history and the biggest play in the advertising industry to date. But don't expect the power-grabbing to end here; according to JupiterResearch, online advertising will make up nine percent of all advertising spending by 2011—a $25.9 billion market.

AACS Foiled Again

The Advanced Access Content System Licensing Authority (AACS LA) just can't seem to catch a break. No sooner had it released a new volume key intended to protect the contents of commercial HD DVD and Blu-ray discs (and invalidate a previous key that was widely disseminated on the Internet) than another breach in its security system was discovered. SlySoft's latest version of AnyDVD is able to rip the contents of even the most recently released HD DVD discs.

A Terabyte to Rule Them All

If Toshiba has any say, the 1TB drives of today might soon become as irrelevant as the floppy drives of yesteryear. Working in conjunction with Japan's Tohoku University, Toshiba is developing a technology called Nanocontact Magnetic Resistance, or NC-MR. It allows drive heads to be smaller, which would in turn increase a drive's storage density to more than one terabyte per square inch (up from today's record of 178.8GB per square inch).

LaCie Hub

TESTED & GEEK DISAPPROVED

What's not to like about a stylish desk ornament that offers a healthy mix of USB and FireWire ports, a bunch of flexible cables, and a USB-powered fan and light? Plenty. The fan and light run constantly when the hub is plugged in, as neither has an individual power switch; your upstream USB and FireWire ports live with all the others, so you'll have cables snaking their way from the orb's narrow passage to the nearest port on your PC; and the hub is easily toppled by a clumsy move or imbalanced array of connected devices. $80, www.lacie.com

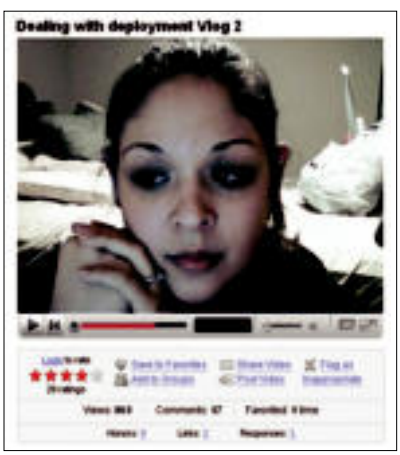
Online Offensive

The U.S. military grapples with Internet issues in a time of war

In May, new rules went into effect barring military personnel from accessing 13 popular websites via Department of Defense computers and networks. Included among the banned sites are YouTube and MySpace. The primary reason given for the edict is bandwidth preservation.

This wouldn't be the first time the military has expressed concerns about bandwidth. In a January 2003 Wired News story, various military personnel spoke of strains placed on the network by not only the vast number of day-to-day communications among troops and support staff, but also the large data and video transmissions tied to today's high-tech weaponry.

But skepticism about the Defense Department's motives still abound. After all, the new rules come on the heels of a recent controversial revision to Army regulations.



Soldiers, civilian contractors, and even family members of Army personnel are required to clear any posts to blogs, forums, or message boards with a superior officer before posting the content online. The reason given for this is operational security, but skeptics see all such moves as an effort to control information about the Iraq War.

DRM-Free Music for the Masses?

Amazon.com's new online music store will sell only unrestricted MP3s

If there's one outlet that could pose a serious threat to iTunes, it's online retail giant Amazon.com. Its mastery of the marketplace will be put to the test when it launches an online music store later this year. Amazon is certainly laying the groundwork for an Apple challenge with its "MP3-only strategy"—according to Amazon founder and CEO Jeff Bezos, all the digital music sold through Amazon will be open-format and playable on any device. Sounds good. So far, however, the only major record label onboard is EMI, and as of May 30, that publisher's catalog is already available sans DRM on iTunes.

Amazon has yet to announce whether its DRM-free music will cost less than iTunes' ($1.29 per track), and which, if any, additional major record labels will join its ranks. Those two factors could be the linchpins to Amazon's success.

FUNSIZENEWS

STAPLES GETS GREENER

Office-supply retailer Staples has expanded its consumer electronics recycling program to now include all types of computer equipment—so you can stop leaving your unwanted gear on the sidewalk. For a $10-per-item fee, consumers can drop off old desktops, laptops, and monitors—regardless of brand or where the items were purchased—at any of the outlet's stores during business hours.

VONAGE HANGS ON

Vonage is going ahead with its appeal of a federal court decision that found the company guilty of infringing on Verizon's patents, but the matter might soon be moot. Vonage recently announced that it may have an alternative to the disputed technology, which allows its VoIP customers to make standard telephone calls. The company says a software-based workaround could be available in a matter of weeks.

IPOD HURTS HEARTS

A 17-year-old Michigan high-school student, working in conjunction with area doctors, has found that iPods can interfere with the functioning of pacemakers. The student, Jay Thacker, studied 83 elderly patients at a pacemaker clinic, holding the device within inches of the implant site for a period of seconds. Thacker observed "telemetry interference" in 29 percent of the cases and misreadings by the devices 20 percent of the time.

HOME SERVER COMES A LA CARTE

When Windows Home Server was announced at CES in January, the headless OS with advanced data backup and protection measures seemed like an ideal solution for sharing files and printers among several machines in one house. Trouble was, you could only get the OS on a prebuilt PC. That all changed at this year's Windows Hardware Engineering Conference (WinHEC). In his keynote address, Bill Gates announced that WHS will be available as a stand-alone product.

Smartphone **vs.** Cell Phone & Digital Camera

When we reviewed the Nokia N95 last month, we said it was the smartphone that just might replace our point-and-shoot camera. But is a $750 do-everything piece of tech the right way to go, or are you better off with a pair of devices that cost just a fraction of the N95's list price? We like the idea of having all our mobile multimedia needs wrapped up in one package—but we won't sacrifice quality for size.

The Nokia N95 sports a glass Carl Zeiss lens and is capable of taking 5MP images; additionally, it includes a host of web and multimedia features. The other handset taking part in this battle, the Samsung SPH-A740 is equipped with just the basics, lacking features that even some giveaway phones have. Luckily, its tag-team partner, the Fuji FinePix F30, comes with a solid set of options. Two-on-one doesn't seem fair, but sometimes you've got to play dirty to get to the truth.

BY TOM **EDWARDS**

round 1 PORTABILITY

The Nokia N95 wins this round hands down. At only 3.9"x2.0", this pocket-friendly piece of technology won't weigh you down. While the phone and point-and-shoot duo are slim for their categories (our freebie phone is 3.50"x1.80" and the camera is 3.6"x2.2"), they still play Hardy to the Nokia's Laurel.

WINNER: SMARTPHONE

round 2 CAMERA FEATURES

The Nokia N95 has many of the features you'd find in a point-and shoot. You can choose to shoot video or still photos, set a timer, and utilize a variety of photo settings—action, macro, and portrait to name a few—and there's even a second camera on the phone's face, so you can make video calls. Unlike many smartphones, the N95 provides enough options to satisfy the basic snapper who relies only on preset controls and even includes white balance and exposure compensation options.

The Fuji, of course, does everything the N95 can (except the video conferencing, naturally) but also gives you many more manual options. If you want to take full control of your images, you need a stand-alone camera.

WINNER: PHONE/CAMERA

CELL PHONE: SAMSUNG SPH-A740
Free (w/ two-year contract),
www.samsung.com

CAMERA: FUJI FINEPIX F30
$330, www.fujifilmusa.com

round 4 EASE OF USE

This is where the N95's collection of features starts to work against it. Say you're going for a leisurely stroll in the woods, listening to the N95's MP3 player, doing a bit of web browsing, and tracking your location via the phone's GPS—suddenly, a chupacabra makes a break from the tree line toward a field of goats. You point, click… and get a message that you have too many apps open and need to free up some system memory. By the time you've fumbled through a load of menus, he's gone, leaving only a faint trail of goat blood and entrails as evidence of his existence. Additionally, running all those apps has left you with no battery power, so you're now lost in the woods, and it's getting late—and el chupacabra's still lurking about.

If you're packing a phone and a camera, these problems won't arise. You'll miss out on some features, but the ones you do have at your disposal will be simple to use.

WINNER: PHONE/CAMERA

round 3 PHONE FEATURES

Our little Samsung was free—and that's the only feature that really matters for some people. If that's the case with you, simply move on to round 4. If you're not that guy who stops by the side of the road to pick up tin cans, read on.

The Samsung may not bring much to the party, but the N95 rolls with the full Monty of phone functions—GPS, maps and city guides, a web browser, an MP3 player, video editing, and a paper shredder (OK, we're not sure about the last one, but it might be in there somewhere). If you're looking for the smartest phone on the block, you've got to go with the N95.

WINNER: SMARTPHONE

SMARTPHONE: NOKIA N95
$750, www.nseries.com

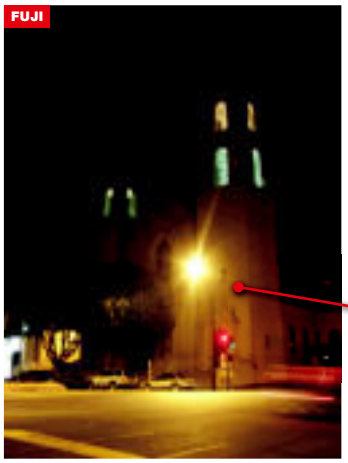
round 5 IMAGE QUALITY

At small sizes, the images produced by the N95 are… passable; however, when set next to photos taken with even a basic point-and-shoot, they simply can't compare. For our test, we used each camera's macro, landscape, and night modes. Our viewing panel had no trouble differentiating the stand-alone camera's images from the N95's. In our landscapes, the sky in the N95 images have an odd purple hue (colors in all the N95's images, in fact, are a bit off). When blown up, the Nokia images show a host of compression artifacts, and in close-up images, our point-and-shoot picked up textures that were lost in the Nokia images. While great for a smartphone camera, the N95 still has a ways to go when competing against stand-alone cameras.

WINNER: PHONE/CAMERA

In the Nokia N95 image the sky has an unnatural purple hue, and there's a significant loss of detail in the grass in the foreground.

Both the Fuji FinePix and Nokia N95 feature a macro shooting mode. While the Fuji camera produced a crisp, detailed image, the Nokia had trouble autofocusing in this mode and created a softer, less-detailed image that again sports a purple hue.



Neither camera's night mode wowed us, but again the Nokia can't keep up with our standalone digital camera. In this case, the Nokia produced a gray, washed-out image.

And the Winner Is...

Smartphones keep getting smarter, and we were impressed by the number of features that were packed into the Nokia N95's small frame. We even suffered from a touch of separation anxiety when we returned the phone and had to do without the GPS, but even though we loved the idea of being able to take care of all our multimedia needs with one device, for now we're going to keep carrying around our Samsung phone and Fuji camera.

Giving up the N95 means we'll also be hauling around a separate MP3 player, since our winning devices lack multimedia playback capabilities (luckily we have deep pockets—alas literally rather than figuratively; we have our pants custom made). The N95's images just aren't up to par with what we'd expect from a 5MP camera, and the phone's power consumption when running multiple apps concerns us as well. If we had our way, we'd pack the N95 and the Fuji and leave the cheapo flip phone behind in order to get the best of both worlds. Until we get that bonus check, though, we'll be sticking with our phone/camera combo. MPC

Our consumer advocate investigates...

✓eDirectSoftware.com ✓Spam Cube Spammed? ✓Hailing SoundTaxi

Deuce, watchdog of the month

NOT-THAT-DIRECT SOFTWARE

In May of 2006, I purchased Windows XP from eDirectSoftware.com for $73.20. Three days later the discs arrived from the company's office in Las Vegas. On inspecting the discs, I noticed they did not have a genuine Microsoft code—only a bunch of numbers printed on a label attached to a plastic wrapper; I had been sold volume-license discs that are not for resale.

I found out that Microsoft has a lawsuit pending against this company, but I made the mistake of just sending the discs back (I should have known better, as I'm 70 years old). Since then, I have tried to get a refund or get my discs back, but to no avail.

Please tell everyone to stay clear of this dealer; maybe I can save someone else.

— Dave English

Part of Dave's problem could be due to the settlement eDirectSoftware.com made with Microsoft as a result of the suit filed against it last October. Microsoft alleged that eDirectSoftware and its apparent owners, Jesse Willms, Linda Willms, and Dave Willms, were "trafficking in counterfeit, tampered, and/or infringing Microsoft software and components, and counterfeit and unauthorized product keys used to install and/or activate that software."

For several months, Microsoft investigators posing as customers purchased software from the company, which Microsoft alleges was either academic software, OEM-only versions, or outright counterfeits. EDirectSoftware eventually agreed to settle the suit earlier this year for more than $1 million. Not surprisingly, the company no longer carries Microsoft products, which may explain why Dave can no longer get the discs he paid for.

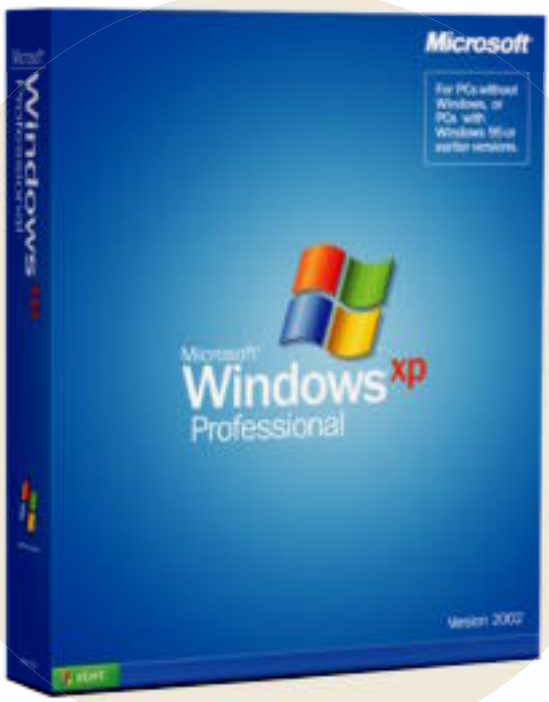
To be fair to eDirectSoftware, the Dog contacted the company to hear its side of the story. While the spokesman did not directly address Dave's situation, he said the software the company sells is perfectly legal.

"Many users are uncomfortable using any nonretail versions. However, if they wish to pay less, they will not be able to find retail versions at the lower prices we offer. Any customer that has a complaint of your customer's nature has not contacted us or read our website properly," the spokesman explained.

EDirectSoftware maintains that programs initially sold with an academic license can be legally resold because of a legal concept called the first sale doctrine. In a nutshell, this allows a consumer who owns a copyrighted product, such as a book, to resell it. The consumer is not allowed to copy the material, but he can sell the product to someone else. So, even if the academically licensed software was originally sold for educational use, it could be resold to individuals or businesses that could then use it commercially.

Is this legal? From what the Dog can tell, probably not. Although there is contradictory case law, representatives from Microsoft and Adobe told the Dog that the resale of software sold for educational purposes is illegal. The Dog's research also leads him to believe that the first sale doctrine does not currently apply to digital rights. And even if Dave did get his discs back, Microsoft has by now zapped most VLK product keys, so they would probably not work.

As far as eDirectSoftware.com goes, the Dog agrees with the Better Business Bureau, which revoked the company's membership and gave it an unsatisfactory record "due to a pattern of complaints." The BBB goes on to say that the company has "failed to correct the underlying reason for the complaints," which mostly concern product issues, delivery issues, refund issues, and customer-service issues. Customer reviews of the store at ResellerRatings.com were also very hot, with the majority of comments in the last six months being negative. In fact, the comments about the store have been so bad that eDirectSoftware.com currently has a rating of 0 out of 10. If that isn't a sign you should stay away, the Dog doesn't know what is. Woof.



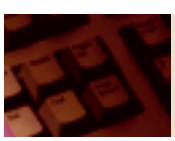
Can you legally use an academic version of Windows XP if you aren't a student?

SPAM, CUBED

Last winter, I read about a new antispam hardware appliance that would virtually eliminate all email spam once the device was wired into your home network. The device, called the Spam Cube, is available from ***http://spamcube.com****.*

After doing a little research and reading all the high praises this thing was getting, I ordered a Spam Cube in January for $150.

A few weeks went by and nothing came. I rechecked my order status and it still showed "Invoiced." I sent several emails requesting a status update on my order, but I never received a reply. I then tried using the company's Live Help online chat system and finally got in touch with someone, but only after several days of



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.

Spam Cube promises hardware-based spam blocking—if you can get one, that is.

failed attempts. I was told that my order would be shipped within the next few days and I could expect it within a week or so (this was around March 16).

To make a long story short, after going through support hell, I finally got someone on the line who offered to cancel my order. However, I did not want to cancel the order, as I had waited so long for one, so I told the person to continue the order. When I checked back, it turned out that my order had been canceled anyway, and I was issued a refund.

Needless to say, after repeated emails and unresponsive Live Help chat sessions (they should call it Dead Help), I have just about given up all hope on Spam Cube. A company like this that advertises an item, takes your order and money, and then fails to send out the merchandise within a timely manner should be ashamed of itself.

I would love the chance to see how well this Spam Cube works, but I am not willing to place another order and wait months again! A customer posting on the company's forums said he had been waiting a year for the device! Incredible!

— Scott Russo

Initially, the Dog suspected that the Spam Cube was no more than a scam, some Photoshopped hardware designed to fleece people of their cash. But upon closer examination, the hardware appears real. Several reviewers have taken the hardware for a spin and, apparently, numerous customers have actually received units. However, when the Dog emailed and phoned Spam Cube regarding Scott's problem, he got no response. Although no negative reports were received by the BBB or ResellerRatings.com, the Dog is curious about the state of the company. The Dog will continue to try to contact Spam Cube to clarify the company's status, but for now, readers are advised to steer clear of the company's products until we learn more. Woof.

YO, TAXI!

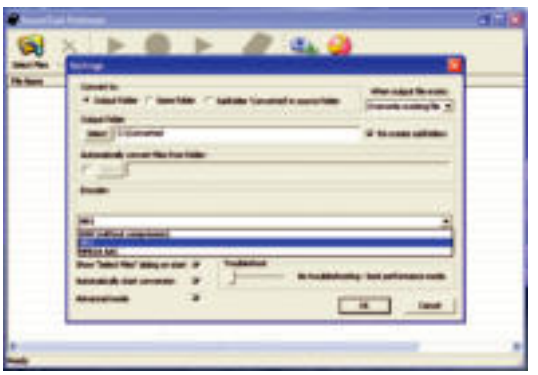
*I was wondering if you have had any dealings with a company called SoundTaxi (**http://www.soundtaxi.info**), which markets and sells an app that converts DRM-protected music to an unprotected format. I'm not really sure how they do this legally, but I don't much care! Curse you, DRM! I purchased this program a while back and have been very pleased with its performance. Recently, I built a new computer and moved everything over to the new machine. My old computer was wiped clean and is now being used to run a Christmas light display (that's a long and different story).*

When I tried to activate SoundTaxi on my new PC, it stated that I did not have a license code for that computer and that I would have to purchase another copy of the program. It is only about $15, but for me it's the principle. When I tried to contact SoundTaxi to get a new license, I got no response. I've been trying to contact them via email since April with no success. I've looked high and low for a phone number, but I'm quite sure that they have purposefully neglected to provide one. I did find out that they are in Kiev, though. I guess I should ask you first, do you think that requesting another license code free of charge is too much to ask? To me it seems like their customers are being locked in to using only one computer for the rest of their lives.

— Josh Jonas

The Dog pinged SoundTaxi to hear its side of the story and discovered that Josh, indeed, has the right to another license: "Our customers can activate SoundTaxi on only one PC. If they want to use SoundTaxi on two or more PCs simultaneously, they need to buy an additional license for each PC. But if they just want to migrate SoundTaxi to their other PC, we will gladly provide them with a new license code. The only condition is they must uninstall SoundTaxi from their old PC. So Mr. Jonas has a full right to receive a new license code free of charge. I will take care of it personally," a spokesperson said.

Good news and death to bad DRM! MPC



A reader said that it's easier to hail an NYC taxi than it is to get SoundTaxi support.

Maximum PC Presents the Ultimate

POWER USERS GUIDE

TO BECOMING A POWER USER

WE KNOW SECRETS. EVERY *MAXIMUM PC* EDITOR IS A REPOSITORY OF POWER-USER TIPS AND TRICKS THAT SEPARATE THE NEWBS FROM THE EXPERTS. IF YOU WANT TO BE A POWER USER, THIS IS THE ARTICLE FOR YOU!

BY THE MAXIMUM PC STAFF

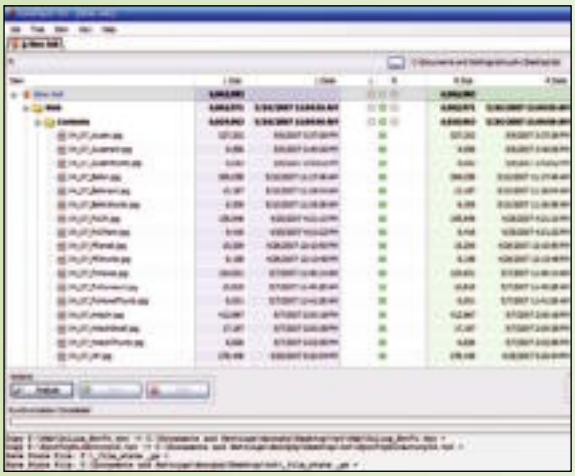
It would be nice if there were some magic potion that a typical newbie could drink one afternoon and then wake up the next morning with all the knowledge and experience of a power user. Unfortunately, there's no such tonic, so you've got to reach that plateau the hard way—by actually learning how your computer, and everything associated with it, works. That's the easy part. The hard part is having the right attitude and state of mind.

Power users want to learn what makes their PCs work, not just how to use a computer. They want to understand the causes of problems, not just the solutions. They want to know what makes one videocard faster than another. Most of all, a power user feels an almost compulsive urge to sculpt his computer (and all the affiliated hardware and software) to perfectly suit his needs.

To help you in your climb to the power-user ranks, we, the *Maximum PC* editors, have compiled the fruits of our collective computing wisdom—the things we all do to customize and optimize our day-to-day computing experience. Some are tiny tweaks that take just a few minutes to complete. Others require substantial time and energy to implement. This compendium of hacks, tweaks, and recommended practices won't make you a power user overnight, but it's a heckuva start!

USB KEY MANAGEMENT

Thumb Drive Backup Made Easy



Tired of manually copying files off your USB thumb drive? Backing up a portable drive to your computer can be a totally automatic process. Download and install the free version of GoodSync (www.goodsync.com), and you'll be able to automatically synchronize your portable drive with any folder on your hard drive any time you plug it in. Seriously. Couldn't be easier!

SECURITY

Make Your Passwords Strong Like Bull

Your mother's maiden name, your address, and your pet's name are all easy to remember—and all terrible choices for passwords. For maximum security, your password should include a combination of at least eight letters, numbers, and symbols; it should also be hard for someone else to guess, but easy for you to recall. Try using combinations that lend themselves to mnemonic devices or use abbreviations as well as numbers and symbols in place of letters in a word. If you're stuck, use one of the sample passwords below as a guide.

```
m@xqdsvmft1
Zr5NGDyH&zR5n
L3ttBR!DBT
```

BOOKMARK SHARING AND SYNCING

Make Your Bookmarks Tastier with Del.icio.us

Imagine keeping your browser bookmarks in sync across all the computers you use—work, home, your laptop. Or better still, being able to access your bookmarks from any computer, anytime, anywhere. The Firefox plugin for Del.icio.us lets you do just that by storing your bookmarks online.

To get started with Del.icio.us, first clean out your bookmark file. After all, there's no reason to pollute your new online bookmark store with old, useless destinations. Next, go to the Firefox Add-ons page (http://tinyurl.com/yo5w42) and download the Del.icio.us bookmark add-on. Once the add-on is installed, it will walk you through the registration process and give you a crash course in storing (and sharing) your bookmarks online.

PRODUCTIVITY

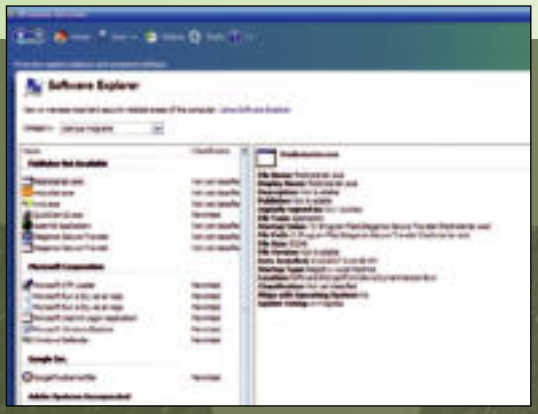
Add a Second Monitor to Your Setup and Spread Out

At any given time, a typical power user will have as many as two dozen windows open on his desktop. Even with a giant 30-inch monitor, you have room to view only a couple of those windows at a time.

Enter your second monitor. By connecting another display to your videocard, you not only gain more desktop space for file storage but also have more opportunity for organization.

PROCESS HUNTING

Get Details on Startup Programs with Software Explorer



How much do you really know about the programs that start up with your computer? Are they all necessary? Are they all on the up and up? Fire up Software Explorer, a subfunction of the free Windows Defender antispyware application (bundled with Vista and available at **www.microsoft.com**). Software Explorer categorizes each application by its publisher and tells you whether the greater SpyNet community has deemed it good or bad for your PC.

STARTUP TWEAKS

Use msconfig to Pick and Choose Your Windows Boot Options

If you want to make your Windows startup quicker or troubleshoot some startup wonkiness, hit the Start button, click Run, and type `msconfig`. Using this handy configuration utility, you can selectively, um... select the parts of your OS you want to run on startup. You can also turn off the graphical loading screen during your standard Windows boot or go directly into safe mode on the next restart. And since all you're doing is enabling and disabling programs, you don't have to worry about your tweaks toasting your machine.

HD SPACE SAVER

Rid Your Disk of System Restore

If you make backup images of your hard drive as a preventative measure against cataclysmic data loss or you just want to conserve hard drive space, then disable the pesky System Restore feature. Right-click My Computer, hit Properties, click the System Restore tab, and turn it off for all your drives. It will save you space, and your backups won't take as long.

PC SAFETY

Six Rules for Safer Browsing

1 Don't open email attachments Don't trust any email attachments you aren't expecting. These attachments are usually machine-generated viral payloads designed to entice the weak-minded into clicking them.

2 Don't use default software Internet Explorer is more secure than ever before. But because millions of people use IE, it's a juicy target for ne'er-do-wells. Switch to Firefox (http://www.mozilla.com) and reduce your exploitation risk.

3 Trust No One Every day, you'll see dozens of offers for free products on the Internet. There's almost always a catch, and the catch can be costly. If an offer sounds too good to be true, it almost certainly is.

4 Pay attention to URLs We've all seen the spam emails and websites that appear to originate from an official institution, such as a bank, but are actually hosted on a server somewhere in Siberia. Pay attention to URLs!

5 Remember that criminals are bad spellers If you do accidentally end up on a phishing site, grammar and spelling problems will often tip you off that something's not right. Trust your instincts before you enter your info!

6 Think before you click Phishers use porn and warez sites to farm new information and infect PCs with their malware. Don't install software from these sites or give them your info!

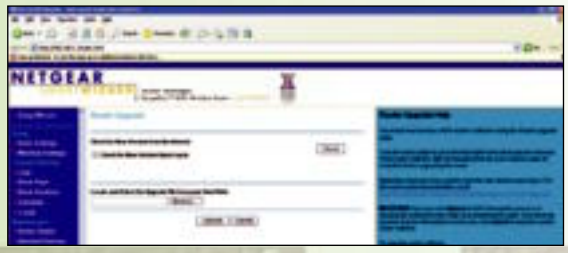
OS DUAL-BOOT

Run Both XP and Vista on a Single PC

Dual-booting XP and Vista is not only easy, it's the technique we recommend for early adopters of that next-gen OS. (Why not have the best of both worlds?) There's just one catch: You have to install the OSes in the right order. If you install XP after sticking Vista on your machine, you'll lose access to Vista. So do what we do when we set up a dual-boot. Back up your important files, wipe your drive, partition it into two chunks, then slap XP on one. After XP's installed, throw Vista on the other partition. If all goes well—and there's no reason it shouldn't—you'll see a boot selection screen once the installation's complete and the system has restarted.

ROUTER OPTIMIZATION

Flashing Firmware Keeps Your Router Happy

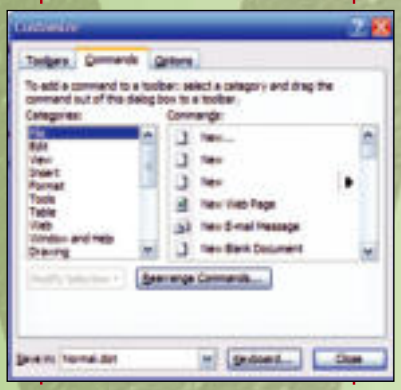


Even if you just bought a brand spankin' new router, your gateway to the Internet is likely using out-of-date firmware—it's embedded operating software. And while that won't necessarily impede your Internet-accessing experience, manufacturers often release enhancements, tweaks, and fixes for routers via firmware upgrades. Surf on over to your manufacturer's website and download and install the latest firmware for your router—the built-in web interface will help you determine whether you need an update. Be extra careful to grab the right firmware; install the wrong pack and you'll fry your box.

APPLICATION OPTIMIZATION

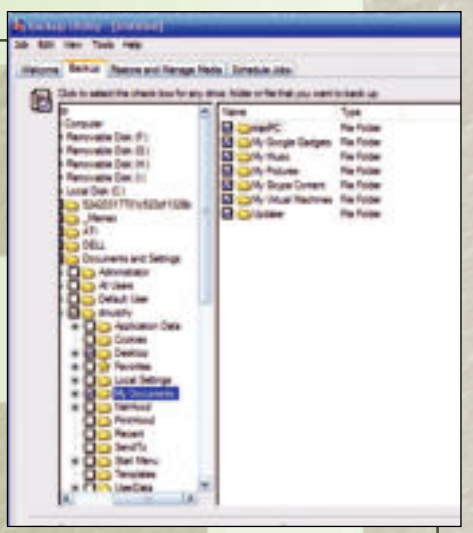
Customize the Toolbars in Your Favorite Apps

If a Windows program comes with a toolbar, you can more than likely customize it. And you should! If you frequently use a keyboard shortcut instead of a displayed button function—like Undo or Copy—then strip it from the toolbar. Replace it with a function that you use regularly but is hidden away a level or two down a menu. Let the toolbar work for you; running on defaults is hardly efficient.



BACKUP STRATEGY

Optimize Your Data Protection Plan



This might come as a surprise to you, but you really don't have to back up your entire system all that frequently. Having a solid backup scheme is an important part of system maintenance, and part of that is knowing what to transfer. Save time (and space) regardless of your backup medium by using a program that lets you specify what gets stored (we like SyncBackSE, http://tinyurl.com/5jatb). Generally, you should regularly back up your user profile and data, not so much the installed programs and Windows. You may not want to back up your photos if you already archive them using an online photo service. Be selective and your weekly backup could take minutes instead of hours.

CD RIPPING

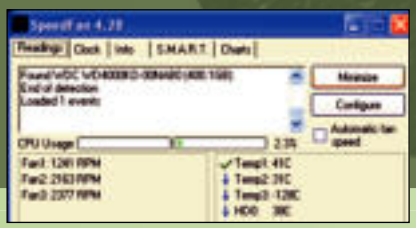
Rip Your CDs to FLAC

Why sacrifice audio quality for portability when FLAC can give you both? Use our online tutorial at www.maximumpc.com/article/flac to rip your CDs to this lossless format and then install MediaMonkey (www.mediamonkey.com) to manage your library. MediaMonkey kicks ass at music management and even lets you load your music player with your newly ripped tunes.

FAN REGULATION

Control Case Noise and Temperatures with SpeedFan

A pedestrian PC user lets his case fans run willy-nilly, making all kinds of noise even when full-on cooling isn't needed. But a power user runs the freeware utility SpeedFan (**www.almico.com/speedfan.php**), which monitors hardware temps and automatically adjusts fan speeds as the situation requires. Read our detailed how-to at **www.maximumpc.com/article/speedfan** to learn more about this invaluable app.



DATA PROTECTION

Empower Yourself with a UPS

A UPS puts the power in power user. Short for uninterruptible power supply, a UPS battery backup resides between your PC and the wall socket, where it patiently awaits any disruption to your utility power. Should a blackout, brownout, or power spike occur, the UPS kicks in, ensuring your PC sips a typical level of juice while you save all important data and porn. Belkin's 1500VA delivers enough power for the beefiest gaming rig ($200, www.belkin.com).

WI-FI BENCHMARK

Measure your Wireless Throughput with Qcheck

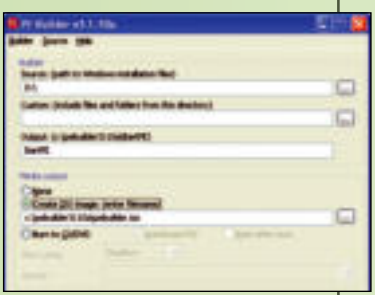
Is your Draft N wireless network performing more like 802.11b? Use the free network-performance measurement tool Qcheck (**http://tinyurl.com/3csl3l**) to uncover your LAN's actual speed.

Install Qcheck on a PC hardwired to your router and again on a PC outfitted with a Wi-Fi adapter. Launch Qcheck on both machines but test from the one hardwired to the router. Choose Local Host from the drop-down menu for Endpoint 1 and type in the other PC's IP address in the field for Endpoint 2. Click the TCP button on the protocol side and Throughput on the options side of the utility. Enter the data size you'd like to test with (1MB is the maximum) and click Run. Using Qcheck, it's easy to see if a bad router setting is bringing down your whole network's performance.

PC MAINTENANCE

Build a BartPE Disc

A power user needs the proper tools to handle a computing crisis, and when it comes to a compromised or corrupted OS, the best tool for the job is a BartPE (preinstalled environment) disc. This is a bootable Windows CD that you can create using the free BartPE Builder (**www.nu2.nu/pebuilder/**). In its most basic form, a BartPE gives you a handy graphical interface with access to system files and network support, but you can also customize your rescue disc in a variety of ways. BartPE supports a host of plugins for many popular utilities, such as antivirus apps, recovery apps, and partitioning tools, so you can truly prepare yourself for anything.



SYSTEM BENCHMARKS

Measure Your PC's Performance

You might think you have a badass rig, but you won't know for sure unless you benchmark it. There are numerous free apps that let you measure the strength of individual components as well as your total system: Futuremark (**www.futuremark.com**) offers 3DMark06 for GPU and CPU testing and PCMark05 for a total system score. Cinebench (**www.maxon.net**) isolates your CPU, HD Tach (**www.simplisoftware.com**) tests your hard drives, and SiSoftware's Sandra (**www.sisoftware.net**) provides performance info on just about any part in your PC. Many of these apps will take you to a website where you can compare your scores with others. Anytime you upgrade a part or a whole system, it's a good practice to take before and after benchmark readings, so you have a quantifiable measure of your performance gain. You can also use benchmarks to measure performance degradations that inevitably happen over time.

NETWORK SECURITY

Dump Default Passwords

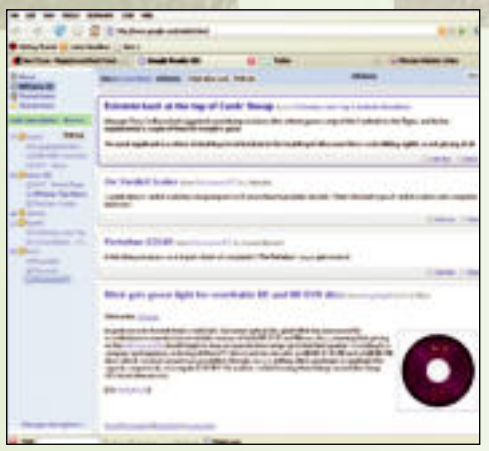
When you move into a new house, you change the locks to keep strangers from strolling into your new digs—don't you?—but do you make the same effort to keep people out of your rig? If the username/password combination for your wireless router is admin/admin, it's time to make a change.

Default router passwords are readily available online (and easy to guess), and once someone is on your network, it's simple to hijack your entire system, gain access to your personal data, or use your rig for dirty deeds.

ONLINE AGGREGATOR

Google Reader Brings the Best of the Web to You

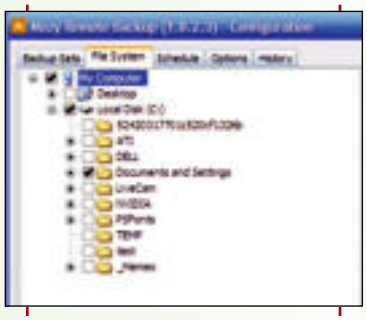
What with all the writing, editing, and benchmarking we do here, we sometimes miss out on the day's events. But Google Reader (**http://www.google.com/reader**), our favorite news aggregator, keeps us on top of what's happening. Other clients are available, but Google Reader allows us to organize feeds into different folders, use keyboard shortcuts, share links, and drop the feed into our iGoogle page. And while good in its own right, the addition of a few nifty scripts we found on Lifehacker.com (**http://tinyurl.com/28fxnz**) makes the experience even better.



ONLINE DATA BACKUP

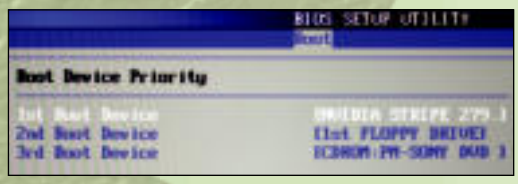
More Convenient than Burying Your Data in the Backyard

One *Maximum PC* staff member argues that online data backup is unappealing because of slow upload times; this person's backup strategy is to load files onto an external hard drive that's kept in a safe-deposit box. While this method is good for your mission critical docs, most of us are more apt to be diligent about data backup if the process is simple. Online data backup is a cheap, easy, and surprisingly speedy way to protect your files should catastrophe strike We love Mozy (**www.mozy.com**), which gives you 2GB of storage for free or unlimited storage for $60 a year. Select the types of files you want to upload and then schedule your updates to run as frequently as you wish, nothing could be easier.



DECREASE BOOT TIME

Bypass Your Optical Drive to Save a Few Seconds Every Day



Once you're finished with your initial OS install, there won't be a need to boot from your optical drive for some time. You can shave a few seconds from your boot time by bypassing the optical drive. To do this, simply go into the BIOS and change the boot order so your primary hard drive is the first boot device.

CRAPLET REMOVAL

Shovel out Your Desktop Outhouse

The rig you order from an OEM will arrive at your door looking all shiny and new but be more bloated than Hugo Reyes after a visit to the hatch pantry. PC makers load up rigs with apps you didn't ask for and are unlikely to use in order to make a lousy buck or two from software vendors. Worse yet, these apps, typically called shovelware—or, more colorfully, craplets—take up hard drive space and can affect your machine's performance. To wipe away the crapware in our rigs, we roll with PC Decrapifier (**www.pcdecrapifier.com**). This free app will remove the most common crapware installed on new rigs, allowing you to enjoy a speedier, less-tumescent PC experience.

OS VIRTUALIZATION

Create Your Own Windows Playground within a Virtual PC

Ever trash Windows XP just by screwing around with the registry? Ever have to reinstall the OS after launching a questionable attachment? A virtual PC serves as a playground for such experiments and keeps your primary OS safe. To get started, download the free Virtual PC 2007 (www.microsoft.com). Install it and grab your OS disc. Using the included wizards, it's fairly easy to install a virtual Windows environment, so you won't be left out in the cold when your experiments go awry.

BIOS TWEAK

Disable Unused Devices and Ports

We don't know why, but by default, your motherboard will assume you're running a parallel port printer and serial modem and leave both ports hot. We recommend that you switch these off. It's simple to do. Just reboot your PC and hit F1, F2, or the DEL key to go into the BIOS during boot. Then hunt for the ports—they're usually listed under Onboard Devices. If you don't use onboard audio or a floppy drive, you can switch them off, as well.

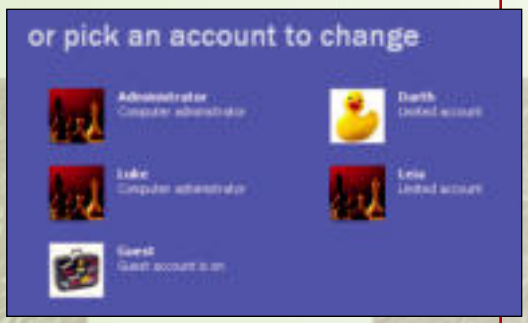
NIC LABELING

Give Your Network Interfaces Descriptive Names

If your motherboard has multiple network ports, it's tough to remember which port is "Local Area Connection 2" in Windows. To prevent confusion, we rename our ports with descriptive names, such as Top Gigabit Port and Bottom Gigabit Port. Just right-click the port in the Network Control Panel and click rename. Confusion begone!

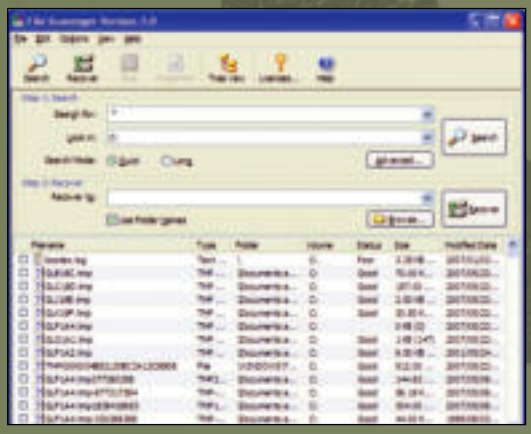
WINDOWS SECURITY

Use Limited Accounts for Guests to Your OS



You may conduct yourself safely online, but how can you be sure about your 14-year-old nephew who just needs to "check his email" on your PC? Within seconds, a guest can render Windows an infested mess requiring reinstall. While you can't prevent all damage, creating a guest account or secondary user account with limited user rights will greatly curtail the damage that can be wrought by friends and family using your PC.

DATA PROTECTION

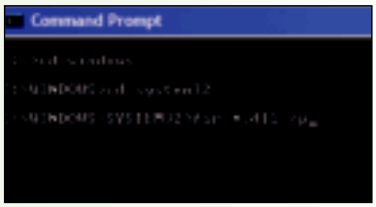


Install Undelete Software Before You Need It

D'oh! You just inadvertently deleted a file that you wanted to keep. But you can't recover it without installing undelete software or booting from another device. Easily avoid those problems by installing an undelete utility *before* you need it. We recommend File Scavenger ($50, www.quetek.com), but even installing FreeUndelete2.0 (www.officerecovery.com) should get the job done.

CLI BOOT CAMP

Learn the Command Line, Young Nerdling



If you were weaned in the age of the GUI, you probably never got your crash course in DOS like the old geezers and don't even known how to navigate in command-line mode. Here are some command-line interface (CLI) basics. Click Start, then Run, and then type `cmd`. This will spawn an emulated DOS box.

▶To change the directory to the root of your C drive, type `cd\` and you'll be greeted with "`C:\`"

▶If you want to dive into the Windows folder, simply type `cd Windows`

▶To back up one level in a directory, type `cd..`

▶To get a simple listing of the files in the folder, type `dir`

▶To create a directory called MaxPC, type `md MaxPC`

▶To delete a file named MaxPC, type `rm MaxPC`

For a full list of all DOS commands check http://tinyurl.com/elaet.

GOT A FAVORITE POWER-USER TIP? *Send your suggestions to input@maximumpc.com, with the subject line "Power User Tips." We'll publish the best ones in a future issue.*

MPC

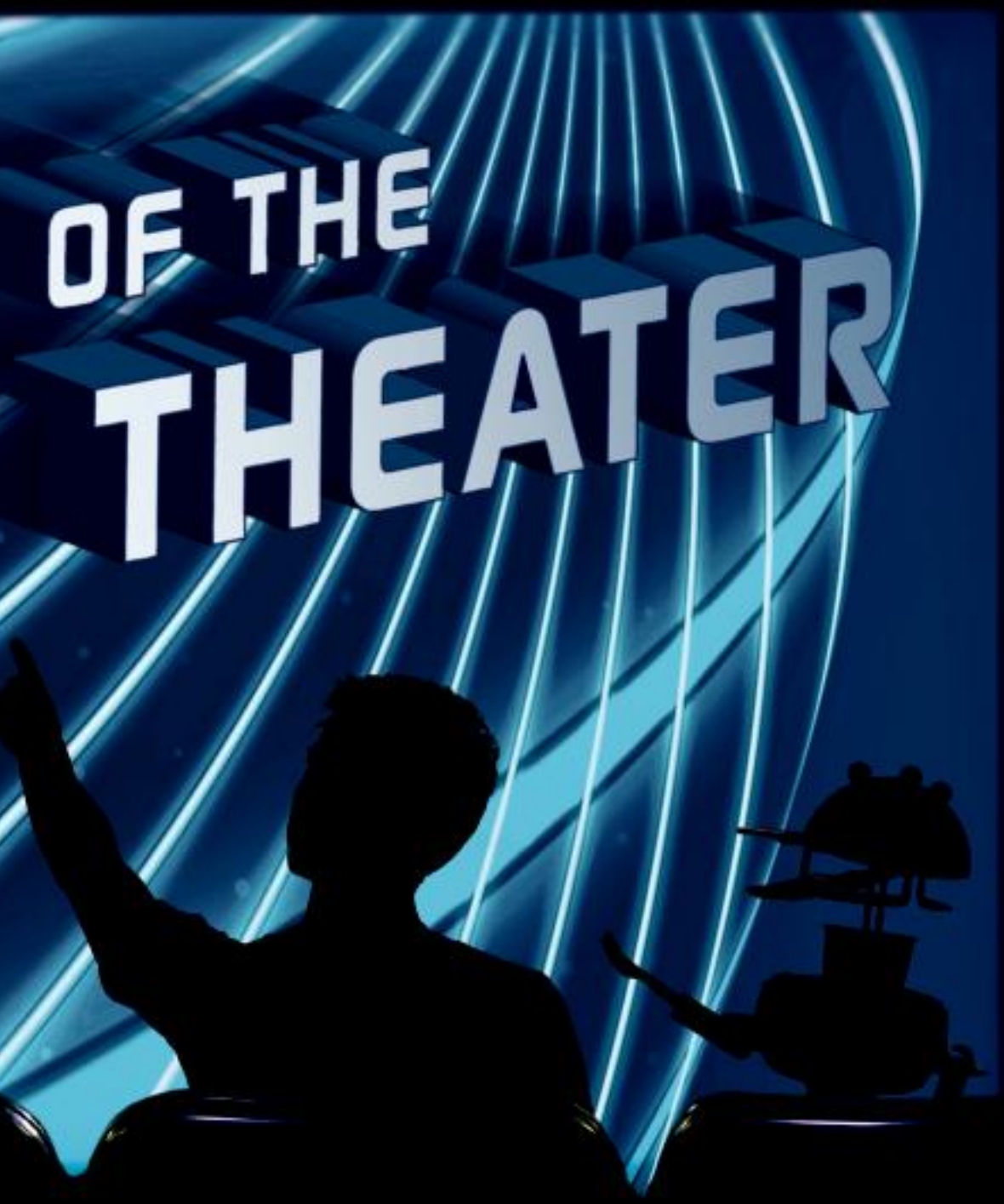
We test the latest machines from three leading media center PC manufacturers to see if any can challenge the mighty TiVo

BY MICHAEL BROWN AND WILL SMITH

PCs have been trying to infiltrate the living room for years, but despite Microsoft's best Windows Media Center efforts, we've always concluded that the computer serves us best on the desktop, not in our entertainment center.

And yet the concept of a home-theater PC (HTPC) remains intriguing. The DVR, after all—TiVo included—is really just a dumb PC with a too-small hard drive. A real computer would not only give us more storage and more choices concerning what we could do with the content we're paying for, but also eliminate the subscription and equipment-rental fees TiVo and the cable companies bend us over for each month.

On the other hand, while streaming music and video from the desktop to the A/V setup in the living room is a piece of



cake, it's another matter entirely to get video from your cable or satellite set-top box into your computer. You couldn't get scrambled content into previous-generation HTPCs, which meant you couldn't use your PC to time-shift HBO, Showtime, and other subscription programming.

What's more, you couldn't get the full range of digital cable—or *any* satellite—programming into your PC unless you rigged up a complicated system of IR emitters and receivers. And then you *still* had to have that blasted set-top box. Using an over-the-air tuner required an unsightly antenna and limited you to local channels—if you could tune in anything at all. Talk about a pain in the rump. It's just been so much easier to rely on TiVo or any other DVR.

The recent introduction of two closely intertwined products promises to resolve our dilemma: Microsoft's Vista and ATI's OCUR CableCard reader. We recently invited three leading HTPC manufacturers—S1 Digital, Velocity Micro, and VoodooPC—to send us their best rigs to see if they could deliver on that promise. As is our practice, we described the application we had in mind—a machine that would fit in our entertainment center and serve as the hub for a whole-house media setup—but didn't specify which components had to be in the system. We also told them gaming wasn't a priority, because we had other machines for that. Will any of these machines finally kill the dedicated set-top box? Or will this movie end up a cliffhanger?

BUYERS GUIDE

If you're buying someone else's idea of the perfect home-theater PC, make sure it's built with the same components and features *you* would choose

CPU

Playing movies and music are core tasks for any home-theater PC, but the machine will also be streaming media to other parts of the house; ripping, encoding, and burning audio and video; and much more. You'll want a moderately fast dual-core proc at a minimum.

FORMFACTOR

A tower is not a good formfactor for a home-theater PC: It won't blend in and it probably won't fit in your entertainment center. An aluminum case will dissipate heat better than steel.

HARD DRIVE

A $600 TiVo Series 3 has a 250GB hard drive, which renders it capable of recording about 30 hours of HD content. Consider yourself lucky if the DVR your cable company provides is outfitted with half that storage capacity. Any HTPC worthy of the name should have at least a terabyte of storage, but remember that some of that space will be consumed by the OS and other software you install. More storage is always better.

MEMORY

Demand at least 2GB of name-brand DDR2 800. More memory doesn't provide any benefit, but less will make your rig run slowly with Vista.

MOUSE & KEYBOARD

They should be wireless, obviously, but radio-based Bluetooth is a better option than infrared because it eliminates any line-of-sight requirement. A keyboard with an integrated mouse is handy, too, but there are times when a stand-alone wireless mouse is easier to use.

The Logitech DiNovo Edge ($200, www.logitech.com) is a fine HTCP keyboard.

OPTICAL DRIVE

Although we're not big fans of either format right now, a Blu-ray or HD DVD drive is the best way to get Hollywood movies in HD. A hybrid drive won't box you into a single format, but you'll pay dearly for the privilege. A burner is supremely helpful for archiving the terabytes of data you'll accumulate.

SOUND

A 5.1-channel audio system is the minimum, but 7.1 is much preferred. The PC should have optical and/or coaxial digital-audio outputs for connecting to an A/V receiver.

TV TUNER CARD

Assuming the kinks with ATI's OCUR technology get resolved (see sidebar below), two of these cards will be a must. The next step down is dual QAM tuners that receive unscrambled digital cable channels. If you're only interested in receiving digital TV over the airwaves, two ATSC tuners will suffice. If you're just connecting to a set-top box, you'll need a tuner with A/V capture.

VENTILATION

An HTPC should be seen, not heard: No one wants to hear the whir of cooling fans during quiet passages in movies or while listening to music. Any fans that *are* present should be whisper quiet.

VIDEOCARD

It's OK to forgo a screaming-fast videocard to sidestep heat and ventilation problems, but make sure it's HDCP compatible; otherwise, you won't be able to watch Blu-ray or HD DVD movies.

THE CABLECARD QUANDARY

ATI's solution for receiving digital cable on an HTPC presents consumers with some vexing problems

ATI's OCUR (OpenCable Unidirectional Receiver), coupled with a CableCard provided by your local cable company, *should* allow you to plug your PC into digital cable service. But if you thought Vista's launch was a mess, CableCard's is a disaster.

For starters, OCUR is available *only* in OEM PCs. As the story goes, Microsoft had to promise the movie moguls an unbroken—and supposedly unbreakable—chain of DRM so that PC pirates couldn't plunder Hollywood's treasure chest. This leads to our second catch: OCUR requires Vista. The third catch: If you want on-demand or pay-per-view services, you'll still have to use a set-top box. Lastly, OCUR works with cable TV *only* (not satellite).

In our experience, however, one problem dwarfed all the others: Internal OCUR cards were not ready for prime time as we went to press. We arranged for a Comcast service technician (through the company's public-relations department) to configure the OCUR tuners in our Velocity Micro and Voodoo machines. After wasting eight hours over two days with the tech trying to connect to Comcast's service—with live telephone assistance from three different Microsoft product managers, no less—we canceled the installation.

According to an FCC mandate, cable TV operators must allow their customers to access digital cable using third-party tuners and recording devices outfitted with CableCard technology.

Since the tech couldn't activate *any* of the four CableCards in our Velocity and Voodoo systems, we suspect the problem lies with Comcast, ATI, and/or Microsoft. But we won't delve any deeper into this mess in these pages because we hope the problem will be resolved by the time you read this. You can, however, find the entire entertaining tale at **www.maximumpc.com/articles/ocur.**

S1 DIGITAL MEDIA CENTER FX EDITION

Hey, is this thing on?

S1 Digital's Media Center FX Edition looks like an audiophile-level amplifier, so it will blend in well with any entertainment center.

S1 Digital's HTPC isn't as powerful as the PCs Velocity Micro and Voodoo whipped up, but the company took our requirements to heart more than either of its competitors. We said we wanted a machine that would fit in our entertainment center and serve as the hub for a whole-house media setup. The Media Center FX Edition certainly looks like it belongs in a home-theater rack, and it's as silent as a tomb.

This rig's CPU, chipset, videocard, and videocard memory are all passively cooled, with the custom-made enclosure serving as a massive heatsink. Heat pipes mounted to the CPU and videocard wick heat to the sides of the massive case (the unit weighs more than 45 pounds), which is then dissipated over 64 1.5-inch-deep aluminum fins. There are three 3.5-inch round vents on top of the case, with a very quiet 9cm fan mounted in the vent centered over the CPU. The only other fan in the entire system is inside the 430-watt Antec TruePower Trio PSU (which exhausts through the bottom of the enclosure). Measuring just six inches high, this unit cuts an attractively low profile. And at 17.6 inches deep, it should be easier to fit in a standard cabinet than previous S1 Digital systems we've reviewed.

As you've probably already guessed—passive cooling and all—the Media Center FX isn't monstrously fast. S1 selected Intel's P965 motherboard, which has only one PCI Express x16 slot, and outfitted its LGA-775 socket with a 2.4GHz Core 2 Duo (E6600). Considering S1's penchant for passive cooling, this rig's Nvidia 8600 GT videocard seems appropriate. The 8600 GT isn't a barn burner when it comes to gaming, but it does support DirectX 10; more importantly, it has Nvidia's second-generation PureVideo HD engine, which offers 10-bit color and is capable of offloading all video-decode chores from the host CPU. Remember, we told each vendor that gaming isn't a concern with these rigs.

A combination of heat pipes and a massive heatsink—consisting of the entire aluminum chassis—provides nearly all this machine's cooling needs.

Recording TV programming, on the other hand, *is* a core mission, and S1 Digital didn't make the qualification cut to include the ATI OCUR tuner cards we needed to connect to our digital cable system. The company assures us it will be offering such an option by the time you read this, but we can only report on what we have in our hands. Based on our initial experience with OCUR, however, the company should be relieved (see "The CableCard Quandary" on page 38 for details). S1's system was outfitted with two AVerMedia AVerTV Combo PCIe cards, each of which has one NTSC tuner and one QAM-compatible ATSC tuner (the latter is capable of recording unencrypted content from digital cable systems).

There's a read-only Toshiba HD DVD drive discretely hidden inside the case, but we're disappointed by the absence of front-mounted USB and FireWire ports and an integrated media-card reader, which leaves you without any way to present impromptu digital slide shows. Aside from that, we absolutely dig this ultraquiet machine.

$5,500, www.s1digital.com

VELOCITY MICRO CINEMAGIX GRAND THEATER

A near-perfect balance of beauty and beast

The Grand Theater's front-panel LED displays not only data from audio and video discs but also the channel number and title of the TV program you're tuned to.

Velocity Micro seems determined to keep us addicted to muscle PCs. We told the company, "We can give up our compulsion for sheer horsepower in exchange for an ultraquiet machine for our entertainment center." So what did we receive? A quad-core monster that left us saying, "Well, it's really not *that* loud."

But when it came to getting the CineMagix Grand Theater's dual internal OCUR cards to work, Grand Theater seemed a fitting description (see "The CableCard Quandary" on page 38 for details). While S1 Digital took us at our word and stepped down to less-powerful—and much cooler—components to enable silent running, and Voodoo split the difference by using a lower-end videocard but Intel's top dual-core CPU, Velocity went balls out and built a machine using Intel's *best* CPU (the quad-core Core 2 Extreme QX6800) and Nvidia's third most powerful GPU (the GeForce 8800 GTS with a 640MB frame buffer).

Unlike the Nvidia 8600 GT in S1 Digital's machine, the 8800 GTS in the CineMagix doesn't have Nvidia's best video-decoding engine, and so it relies on the CPU for much of the HD video decoding work. But who cares when you have a quad-core CPU to work with? And in spite of all that electronic might (and the 700-watt Seasonic power supply fueling it), Velocity's CineMagix was quieter than the Voodoo Aria. Compared to the S1 Digital Media Center FX, on the other hand, Velocity's entry sounded like a banshee, but this is one she-devil we can live with.

In terms of storage, Voodoo's Raptor/Barracuda combo is faster, but Velocity's solution is more sensible: three Hitachi terabyte drives in RAID 5. Although the usable storage capacity equivalent of one drive is consumed by parity in this type of array, you gain a measure of data recoverability if one drive fails—not to mention 1.8 terabytes of storage. Not enough for you? There's room inside the case for one more terabyte drive. You can use the Lite-On 2x Blu-ray burner to create archival backups as well as watch movies, but Velocity's drive choice locks you into Blu-ray. We much prefer Voodoo's hybrid drive, which gives you both Blu-ray *and* HD DVD.

Velocity Micro has something for every expansion slot—including an Nvidia videocard—in Intel's CrossFire-compatible Bad Axe II motherboard.

If recording two programs at once isn't enough to slake your thirst for TV programming, Velocity includes a third TV tuner in the box (an ATI TV Wonder 650). But why bother? In a Media Center environment, this third tuner is useless, since it won't receive the full array of channels the OCUR tuners get—we'd happily trade this bit of fluff for a dedicated soundcard. Even an audio riser board would be better than leaving audio down on the mobo. The Netgear 802.11g Wi-Fi adapter, on the other hand, is welcome to stay.

OK, we'll admit it: We succumbed to Velocity's "Come on, you know you want it" approach. Assuming OCUR's teething problems are resolved by the time this issue hits newsstands, the Grand Theater will be not only a fantastic home-theater PC but also a rig that's adept at gaming.

$6,500, www.velocitymicro.com

VOODOO ARIA

Yeah, it's got that, too. But it costs how much?

The Aria is particularly useful for home theaters that use video projectors instead of TVs: You can perform quick tasks using the front-mounted LCD and conserve your projector bulb.

An ATI Radeon HD 2600 videocard sitting in an Nvidia-designed SLI motherboard wasn't quite what we expected to find when we cracked the lid on the Voodoo Aria. But the two make a surprisingly good tag team.

Voodoo's HTPC Quiet Aluminum Chassis echoes the Ahanix MCD701 we chose for our own build-it project in the October 2006 issue, complete with a front-mounted LCD. The Aria is stuffed with plenty of other juicy components, too; then again, it's also the most expensive of the three machines we looked at—by a wide margin. Examined from a price/performance ratio, this Aria sounds just a little off key.

Large 11.5cm case fans on each side, accompanied by two 7.5cm case fans on the back, contribute to a noise signature that's louder than the Velocity's and significantly louder than the virtually silent S1 Digital. And why use side-mounted fans to cool a machine that's destined to be shoved into an entertainment center? Most of these cabinets are designed to accommodate gear that's 19 inches wide; it seems like the 16.5-inch-wide Aria would suffocate.

Voodoo's entry came with two ATI OCUR CableCard tuners (one of which was sitting in the motherboard's second PCI-E x16 slot), but our Comcast service tech couldn't get either of them to work (see "The CableCard Quandary" on page 38 for the full scoop). The Radeon HD 2600 offers just 120 stream processing units, compared to the Radeon HD 2900 XT's 320, so this isn't a great DX10 gaming card, but we're more interested in its video capabilities anyway. From that standpoint, it's excellent in terms of both image quality and the ability to offload work from the host CPU.

Voodoo was unique in offering not only a dual-format HD-video drive (Blu-ray read/write plus HD DVD read) but also a multiformat CD/DVD burner (with LightScribe technology, no less). The spring-loaded, flip-down doors covering the two drive trays are the epitome of slick. The hard-drive configuration is equally over the top: two 74GB Raptors in RAID 0 for the operating system, plus two 750GB Seagates in RAID 0 for data storage. We adore the capacity—what's not to like about having 1.3 terabytes of storage at your disposal?—but the failure of either drive will result in unrecoverable data loss on both.

Voodoo loaded this machine like it was Noah's ark: two cores, two tuners, two Raptors, two Barracudas, two optical drives....

We're always in favor of getting audio off the motherboard, especially in a PC intended to serve as the heart of our entertainment center, so we have to applaud Voodoo for including Auzentech's X-Meridian 7.1 soundcard. Audio quality is the key benefit here: Voodoo's machine is equipped with an Intel Core 2 Extreme X6800 running at 2.93GHz, so it has plenty of CPU horsepower.

But we keep coming back to that price-performance ratio. The Aria is priced $850 higher than the Velocity Micro rig, which is equipped with an even more powerful quad-core QX6800 processor, and Voodoo's box is $1,850 more expensive than S1 Digital's, which is virtually silent. We just don't see the value.

$7,350, www.voodoopc.com

head2head

TiVo Series 3 **vs.** Windows Media Center

Now that you've seen the hardware behind these HTPCs, let's take a look at the software that powers them, Windows Media Center, and compare it to the leading set-top box software, TiVo. As you may know, Media Center is included with Windows Vista Ultimate and Windows Vista Home Premium, while TiVo only comes with custom consumer electronics (and, in theory, some cable providers' DVRs, eventually).

Follow along as we break down the major points in the PVR battle.

TIVO
www.tivo.com

round 1 PRICE

The TV scheduling info included with Media Center is free. TiVo charges $13 a month for the same data. Of course, if we're comparing a Series 3 TiVo ($600 + $13/month) to the Velocity Micro HTPC ($6,500), it will take about 454 months—that's 38 years—for TiVo's monthly charge to equal the high price of the HTPC. Sure, the HTPC can do other stuff, but if it's in your living room, will you be using it for other tasks?

WINNER: TIVO

round 2 PVR FEATURES

Both competitors in this battle have compelling features. TiVo is the gold standard for PVR software, with lightning-fast response times, intuitive recording controls, remote scheduling, automatic suggestions based on your viewing habits, and an interface so simple that your parents—no, your grandparents—can use it.

On the other hand, Media Center handles the basics really well. Recording specific shows works great, and we love the dedicated interfaces that make discovering movies and sporting events simple, but even on a high-end rig, we wouldn't call Media Center snappy. And Media Center lacks many of the features that make TiVo spectacular for TV viewing, like easy recording of an entire season of a show, or recording by keyword, actor name, or subject matter.

WINNER: TIVO

round 3 VIDEO/AUDIO QUALITY
Early TiVo boxes did a fairly crappy job of encoding video, but newer Series 2 and Series 3 models work much better, with support for Dolby Digital 5.1 and high-definition video (in the case of the Series 3). The video quality you get from a Media Center depends largely on the tuners the manufacturers use. We were very interested to see how the OCUR CableCard tuners compared to similar direct digital high-definition tuners in the Series 3 TiVo. Unfortunately, we couldn't get the CableCard tuners to work, so this round goes to TiVo by default.
WINNER: TIVO

round 4 VERSATILITY
TiVo has added tons of functionality to its closed boxes, including casual games, support for Amazon's downloadable Unbox movies, podcast support, video streaming from the web, and streaming of photos, music, and even home movies from a home server.

On the other hand, with Media Center, you have a fully featured PC hooked up to a high-resolution screen in your living room. That gives you access to the web, every game that works on Windows, and anything else you can do on a PC. That makes this category a clear win for the PC.
WINNER: MEDIA CENTER

round 5 DIY-NESS
At this time last year, Media Center would have won this round handily. Back then, you were able to build a fully featured HTPC with Windows Media Center for a fraction of the price you'd pay for a retail machine. But with CableCard support available only to large OEMs who certify their machines (and not to home builders), the only way to get an HD-enabled Media Center is to buy one off the shelf. Of course, you still can't build a TiVo of your own either.
WINNER: NEITHER

WINDOWS MEDIA CENTER
www.microsoft.com

And the Winner Is...

If you're paying for your hardware (and aren't we all?), it's **tough to beat TiVo**. Given TiVo's high-definition PVR functionality, we can't in good conscience recommended the much more expensive Media Center over a dedicated box. For what these OCUR-equipped PCs cost, we could buy a top-of-the-line TiVo (and a terabyte hard drive to maximize its capacity) with plenty of cash left over to build a kick-ass gaming rig.

Unfortunately, by giving access to OCUR technology to OEMs only, the content industry has destroyed the market for high-definition-friendly, home-brew HTPCs, whether you use Windows Media Center, MythTV, BeyondTV, or one of the alternatives. If we're ever able to build our own OCUR boxes, we'll have to revisit this debate, but until then, we're going to recommend dedicated boxes like TiVo. MPC

Put Your PC to Sleep and Save Hundreds of Dollars!

Use your computer's S3 standby mode to dramatically minimize power consumption without sacrificing functionality

BY CAMERON BUTTERFIELD

The power requirements of the modern enthusiast's desktop PC have jumped to astronomical levels. Rigs sporting multiple processing cores and graphics cards and multiple hard drives in RAID configurations require more juice than previous generations of hardware did. Some high-end power supply units are now rated in excess of 1,200 watts. A modern computer enthusiast's gaming rig, including monitor, might pull as much as 400 watts just idling. Leaving a computer on all the time can translate into a pretty hefty power bill at the end of the month. In our scenario, an "always on" 400 watts at a $0.12-per-kilowatt-hour rate would cost you $34.56 a month! When talking these kinds of figures, it's easy to see how taking the time to configure a proper power-saving state for your PC could save you some serious cabbage.

Your computer is capable of several different power states, ranging from fully on (SO), to slightly powered down (S1), to virtually off (S3, or standby), to fully off (S4, or hibernate). In this article, we're going to focus on the S3 power state, as it provides incredible power savings with only a few seconds of recovery time. You might be thinking you can't use standby mode because you need your computer to be on all the time as a file server or you need remote access to your PC. Well, keep reading because we'll prove you wrong. In the following pages, we'll show you how to not only enter and troubleshoot the S3 standby power-saving state but also configure your computer to awaken when files are requested over the network or you need remote access to your PC.

PHOTOGRAPHY BY SAMANTHA BERG

Enable Your PC's S3 Sleep State

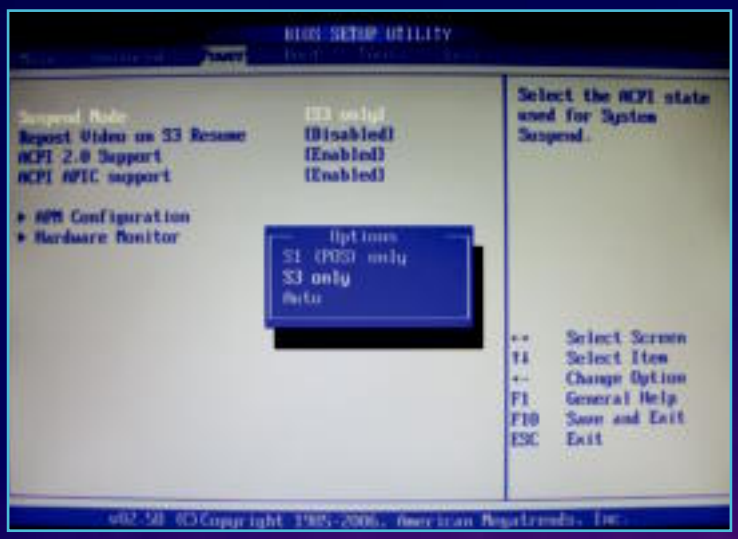
It's quite possible your computer is already configured to use the S3 standby state. Here's how to find out and how to troubleshoot issues that stand in your way

Signs of Sleep

To determine whether your PC is configured to use the S3 state, first put your computer in standby: In Vista, go to Start, then the Power icon, then Sleep; in XP, go to Start, then Shut Down, then Standby. Once the computer is in standby, you can tell if it's utilizing an S3 power state because no fans will be spinning and no noise will be emanating from your computer. This is because S3 standby mode turns off all the components inside your system except memory, so your rig will use as little as 1.8 watts! If your fans are still spinning, your computer is in S1 standby mode, which generates minimal power savings and does not have the advantages of an S3 power state. If your computer was unable to enter S3 standby in this test, all is not lost. Read on to learn how to enable S3 successfully.

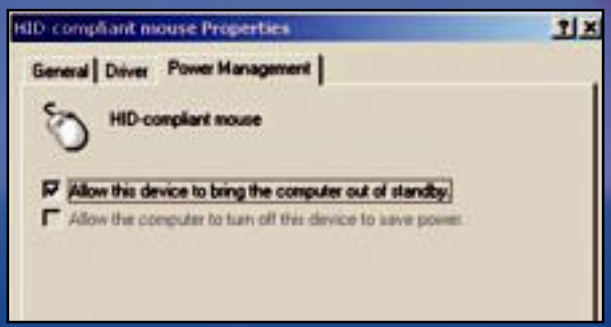
Configure BIOS Settings

The most common reason a computer fails to enter S3 is because the BIOS has not been configured to take advantage of this mode. To enter the BIOS, you must hit a specific button on your keyboard when your computer is first initializing, usually the Delete key. If pressing the Delete key doesn't work, refer to your motherboard manual for instruction. Next, go to the Power Management section of the BIOS. Once there, you should see options for changing the default suspend state. Here you must choose to enable S3 suspend mode. You'll also want to enable any ACPI (Advanced Configuration and Power Interface) support options. Setting these options correctly is essential for entering S3 standby. Ideally, these settings will be in place before Windows is installed, so the OS can configure its sleep states upon installation. However, if you installed Windows without having set these options, it won't prevent you from entering S3.



You may need to configure your BIOS to enable the S3 standby state.

WHAT IF MY USB MOUSE IS UNABLE TO AWAKEN THE SYSTEM FROM STANDBY?



If you are unable to wake your computer from standby after you wiggle your mouse several times, the mouse's power-management features may have been disabled. To resolve the issue, you must manually enable the mouse's power management features. Go to Control Panel, click System and then Device Manager, and then locate the entry for your mouse in this list; right-click it and choose Properties. Click the Power Management tab and select "Allow this device to bring the computer out of standby." Your mouse should now be capable of awakening your computer from standby when you move it.

Correct USB Compatibility

Though it may sound strange, your USB devices could be keeping you from entering the S3 standby state. Because some older USB devices are incapable of resuming from sleep modes, when Microsoft released Windows XP, the OS wouldn't allow S3 standby if USB devices were present in order to prevent a computer from entering a sleep state it couldn't come out of. Fortunately, almost all USB devices are now fully compatible and won't cause any problems with standby states, and the ability to enter S3 sleep mode while using USB devices is easily allowed through the use of a registry entry. Just open regedit and create the following registry entry: `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\usb "USBBIOSx"=DWORD:00000000`

If your computer enters S3 standby after setting this registry key but then immediately awakens all by itself, it's probably set to resume upon any USB activity and a USB device is sending signals to the computer nonstop. While it's better for most users to have USB wakeup capability enabled, if you're having these problems, you can try disabling the option to wake on USB activity in the BIOS. This should fix your compatibility problems, but it means USB remotes, mice, and keyboards won't be able to bring your system back from standby—you'll need to use the Power button to resume. Alternatively, if you find that your computer is unable to resume at all from standby after setting the above registry setting, it could be that one of your USB devices is incompatible with the S3 state. You can either delete the registry key and stick with S1 mode or try disconnecting certain USB devices until you're able to identify the conflicting device and replace it.

After having set these options, your computer should now be configured to enter S3 standby mode.

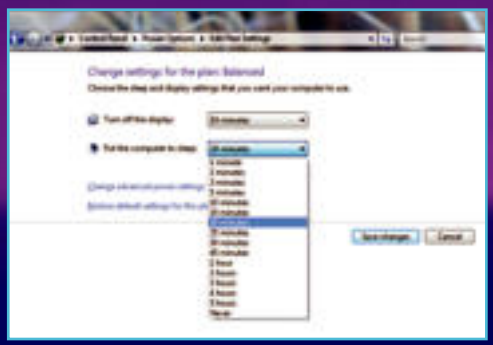
You can bypass USB restrictions with a registry key.

If a connected USB device sends signals to your PC nonstop, you will need to disable the USB Resume from Suspend option in your BIOS.

Select a Power Profile

Now that your computer is capable of entering S3 standby, why not allow your rig to do just that whenever you step away from it? You'll want to configure a power profile in Windows that allows your PC to go into standby mode after a specified number of minutes. To do this in Vista, go to the Hardware and Sound section of your Control Panel, select Power options and then Edit Plan Settings. In Windows XP, go to the Power Options section of your Control Panel. The number of minutes you choose depends on your personal preference. Keep in mind that if you're playing a movie or someone is remotely accessing files on your computer, the PC will not go to sleep until all activity has stopped.

In Windows XP, set your power profile in the Control Panel's Power Management section.



In Vista, you can create a power profile within the Hardware and Sound section of the Control Panel.

Make S3 Standby Act Like 'Always On'

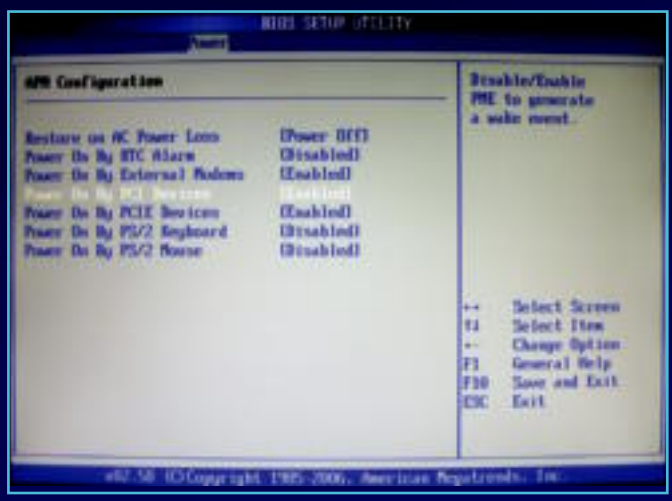
Whether your PC acts as a file server, a remote access point, a VNC server, or something else entirely, you'll want to configure it to resume from standby when it detects network activity

Configure Your PC to Wake on Demand

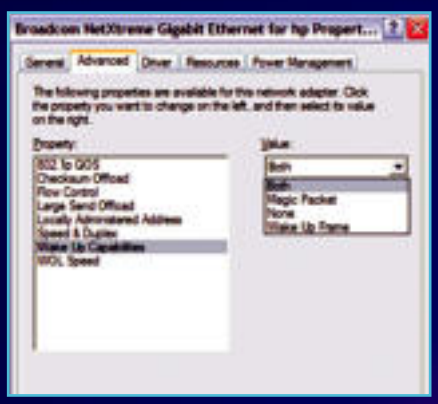
Enter your BIOS and make sure WOL (Wake On LAN) and the Power On options for modems, PCI devices, and PCI Express devices are enabled. You may need to check your motherboard manual for specifics since not all BIOSes are the same.

In Windows, you'll need to configure the wake-up capabilities of your network device. To do this, navigate to the Control Panel, double-click Network Connections, right-click Local Area Network, and then choose Properties. Your network adapter will be visible in the Properties box. Click Configure and then navigate to the Advanced tab. Select Wake Up Capabilities. Here you want to enable any wake-up options available. Choose "both" or "Magic Packet & Pattern Match."

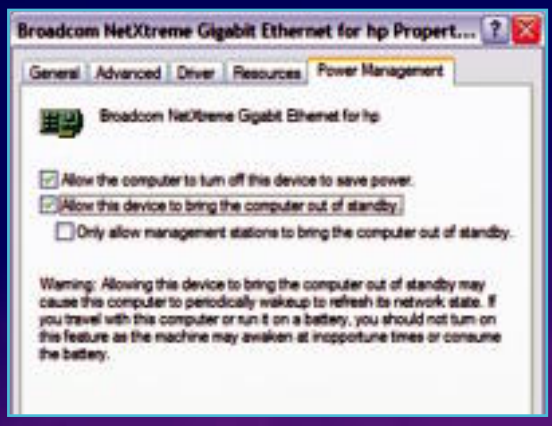
Next, choose the Power Management tab and check "Allow this device to wake the computer." Reboot your computer, and you'll be able to enter standby mode, but your rig will still awaken when it detects incoming network activity.



In the BIOS, enable Power On options for WOL, modem, and PCI-E devices.



You'll need to set your network adapter's wake-up capabilities in Windows.



Once you set the power management options for your network adapter, you're all set.

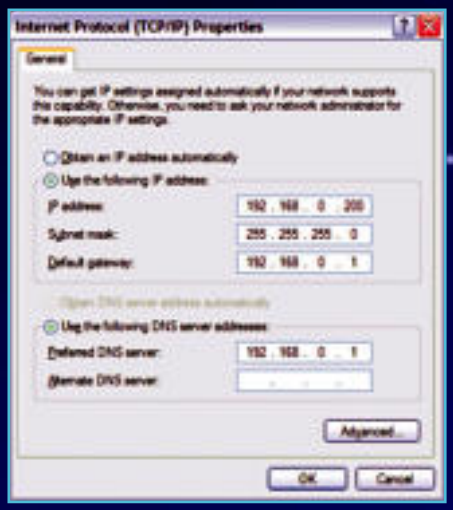
HOW WILL S3 RESPOND TO SCHEDULED ANTIVIRUS SCANS AND DEFRAGS?

Some tasks need to be run regularly, such as virus scans, backups, and defragmenting jobs. If your computer is in standby all the time, how is it supposed to run these programs? Not to worry, most utilities are programmed to bring the computer out of standby automatically to run these tasks. Alternatively, you can use Windows's built-in task scheduler. To do this, go to Start > All Programs > Accessories > System Tools > Scheduled Tasks. Then select Add Scheduled Task to launch the wizard and create your task. You can schedule any program you want. Just be sure to click the box that says "Wake the computer to run this task" on the Settings tab. This option works for programs that are unable to bring the computer out of standby—use it to wake the computer a few minutes before the application is scheduled to run.

Set a Static IP Address

When your computer is in standby mode and your Ethernet adapter is set to wake the computer on network activity, we've found that it's more reliable to access the computer by its IP address rather than the Windows network name of the computer. Since a dynamically assigned IP address changes frequently, setting a static IP on your PC (if you haven't already) will allow the computer to wake reliably every time—the network activity on a static IP will be delivered directly to the PC. To set up a static IP address for your PC, navigate to the Control Panel and then Network Connections. Right-click Local Area Network and choose Properties. Select Internet Protocol (TCP/IP) and then click Properties. Here you can set your IP address manually.

A good rule of thumb is to look at your current dynamic IP address; you can find it by typing `ipconfig /all` at a command prompt (you should also take note of the DNS, subnet mask, and default gateway). Change the last three digits of your IP address to a lower number to avoid conflicts. Most routers reserve some IPs in the x.x.x.5 to x.x.x.99 range for statically assigned devices. You'll also need to manually set your subnet mask, default gateway, and DNS. Once you have made your changes, click OK. Your network adapter will then reconfigure itself based on the new IP address. Now you can access your machine over the network using the static IP, even when it's in standby mode!

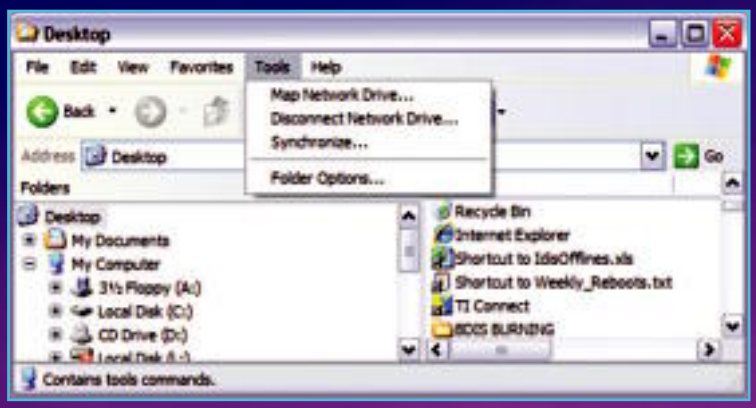


When you want to awaken your PC from standby mode, a static IP address is more reliable than a dynamically assigned one.

Map Network Drives for an S3 State

We've found that the most reliable way to access networked files on your S3-enabled file server is to set up your shares based on the IP address of the machine rather than the Windows network name (i.e., "192.168.0.200" instead of "office"). The easiest way to access your files using the local IP is to create a mapped drive. To do this, enter Windows Explorer, hit Tools, and then select Map Network Drive. Map the drive to the path you desire using the static IP. This way, you don't have to type in the IP address, \\192.168.0.200\, for example, every time you want to access the machine; you can simply navigate to a drive letter, which will wake the computer when accessed.

Mapping a static IP as a network drive makes accessing shared folders much easier.



Use the static IP address you created in the previous section as the folder for a shared drive.

WILL S3 STANDBY WORK WITH A MEDIA CENTER PC?

A home Media Center PC probably benefits the most from an S3 standby state, as it typically doesn't get as much use as a business computer and can spend more of its time in standby. Windows Media Center has built-in standby capability, which means that Windows will automatically bring your computer out of a standby state to record your scheduled programs and then go back to sleep. Follow the same directions in this article to ensure that your Media Center PC is consuming minimal energy when not in use. MPC

Fix Vista Annoyances

If you've upgraded from XP, your new OS will take some getting used to. We help you smooth the transition.

TIME 00:48 HOURS:MINUTES

After the buildup of excitement and anticipation, it's finally arrived. You installed Windows Vista. You're the envy of your friends—you're on the cutting edge of technology.

However, your initial enthusiasm may be fairly short-lived once you start using Vista. It might be the latest technology and the greatest thing since sliced bread, but seasoned PC users won't be impressed with every new feature. In fact, some of them are just plain annoying.

Windows Vista has some genuinely useful new features; however, Windows wouldn't be Windows without its idiosyncrasies. But there's no reason for you to put up with anything that's irritating or redundant. We'll show you what you're likely to come up against so that you're sufficiently equipped to deal with problems as they arise. In some cases, you'll be able to get rid of an annoying attribute altogether; other times, you can change a setting to make Vista less irritating.

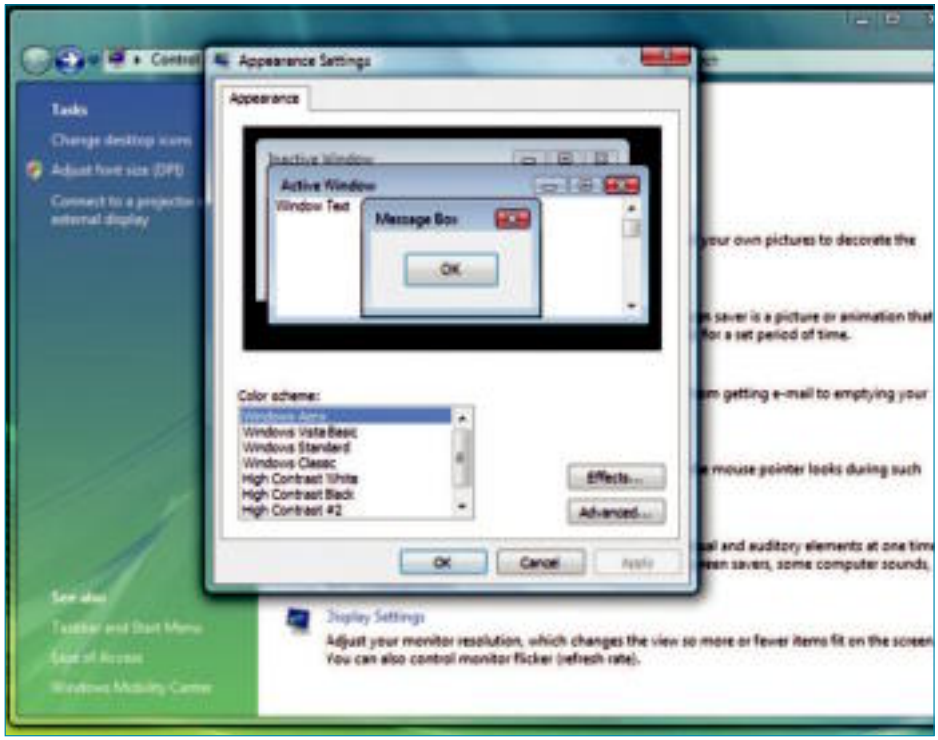
BY PAUL **TOWNSEND**

What to Do When Aero Stops Working

To make some applications within Vista work correctly, TV tuner software for example, you may have to downgrade your graphics settings. This will cause Aero to switch off while the application is running. The problem is that once you've finished using the software in question, Aero doesn't necessarily turn back on again automatically.

This highlights a particular annoyance within the OS. To change many of the basic settings in Windows Vista you have to drill down through numerous levels before reaching the item you need to tweak. To reactivate Aero, right-click the desktop and choose Personalize. Click Window Color and Appearance and then select "Open classic appearance properties for more color options." Select Windows Aero under Color Scheme and then click OK and close the dialogs.

You'll experience a similar problem when attempting to change time and date settings. In XP you can simply double-click the clock and make the necessary changes. In Vista you have to work through numerous options.



Aero is Windows Vista's show stopper, so make sure it's activated.

Gentle Reminders

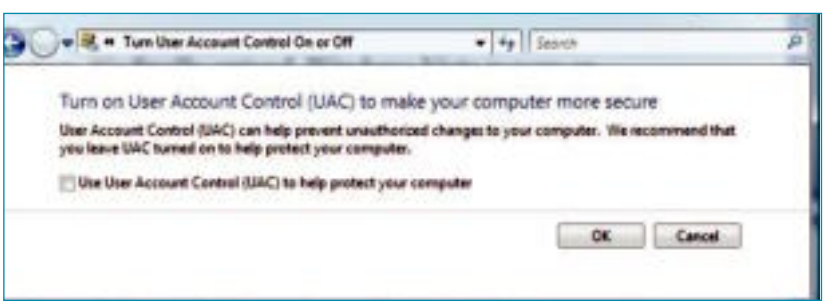
When you begin using Windows Vista, you'll notice that balloon tips pop up every now and again. To be fair, they can be informative when you are beginning to find your way around the OS. However, it doesn't take long to get fed up with the obvious being stated every time a task is carried out.

To disable these tips, click Start, type `gpedit.msc`, and press Return to launch the Group Policy Object Editor. Under Administrative Templates, click Start Menu and Taskbar and then select "Remove Balloon Tips on Start Menu Items." Click Properties and then under the Settings tab check the Disabled option. If you're using Windows Vista Home Premium edition, you won't have access to the Group Policy Object Editor. Instead, you'll need to use the registry editor to disable balloon tips. Click Start, type `regedit.exe`, and then press Return. Browse to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced. In the right pane, click Edit > New > DWORD Value. Enter `EnableBalloonTips` in this field. Its default value of 0 will ensure that the tips are disabled.

QUICK TIP

In Windows XP it's simple to choose which column details appear in an Explorer window. In Vista, right-click any existing column and choose More to add more columns.

Do You Want to Disable Annoying Popups? Confirm/Deny



User Account Control popups occur so frequently and are so annoying that users quickly get in the habit of always allowing applications to do whatever they want.

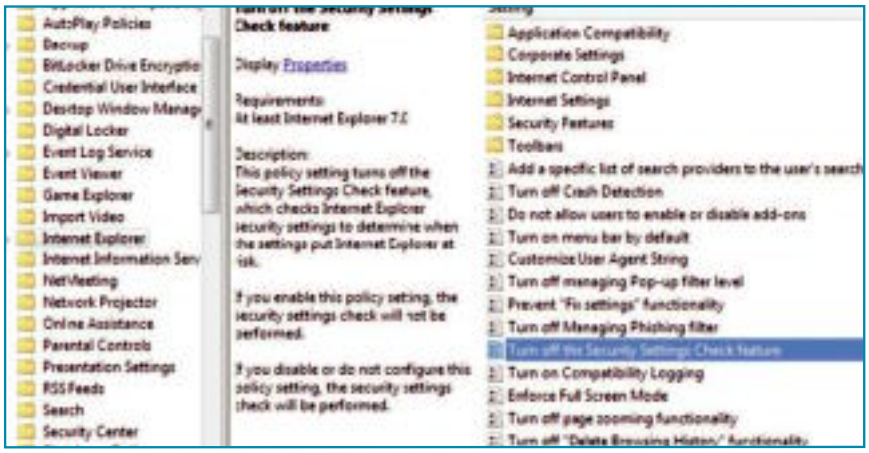
User Account Control is a new Windows feature that's designed to prevent unauthorized changes from being made to your OS. It's deemed so important that it's now monitored in the Security Center to see if it's functioning on your system correctly.

The drawback with this feature is its hugely frustrating inability to distinguish between good and bad actions. Unfortunately, it's unable to recognize the difference between you, the logged-in user, and a malicious attack from a third party. Therefore, whenever you want to make a change that could potentially affect your system, you'll be prompted with a security warning. You'll then have to decide whether you want to allow or block a particular task or action that's attempting to proceed.

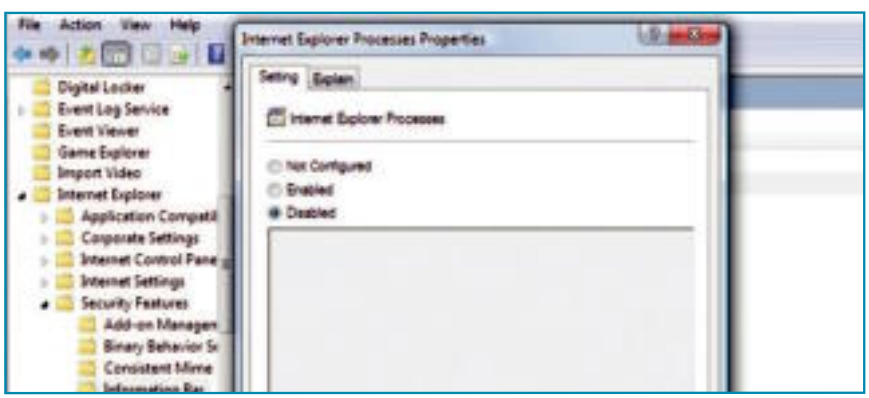
The other major problem with User Account Control is that you may experience problems with older programs that are used to working with full administrator access. Although it has been implemented for your safety, UAC can become extremely annoying.

If you'd rather deactivate this feature, click Start and then go to the control panel. Type `UAC` into the search box and follow the prompts to disable User Account Control.

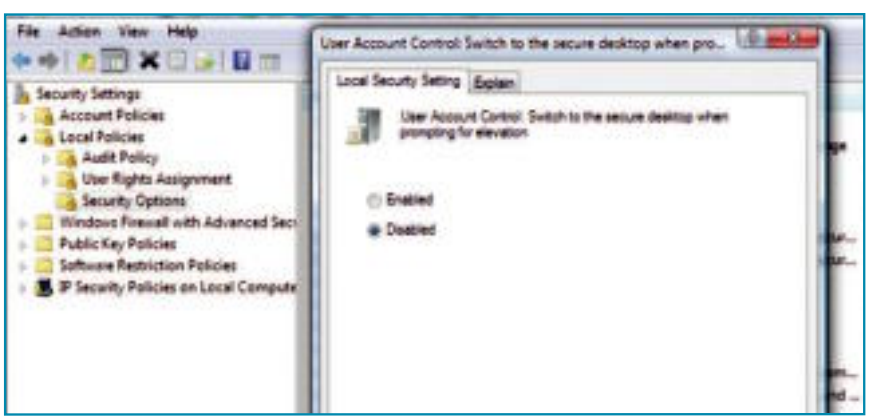
Edit Vista's Security Settings



To prevent IE security prompts, click Start, type `gpedit.msc`, and press Return. Under Computer Configuration, select Administrative Templates > Windows Components > Turn off the Security Settings Check Feature > Properties > Enabled.



To turn off the IE information bar, go to Computer Configuration > Administrative Templates > Windows Components > Internet Explorer > Security Features > Information Bar > Internet Explorer Processes. Click Properties > Disabled.



To prevent your display from turning gray, click Start, type `secpol.msc`, and press Return. Go to Security Settings > Local Policies > Security Options > User Account Control. Switch to the secure desktop. Right-click it and then choose Properties > Disabled.

LOCKED FOLDERS

After upgrading to Windows Vista from XP, you may find that you can't access some folders. You may be logged in with an administrator account, but the warning message "Access is denied" still appears. This can happen for a variety reasons. It's possible that someone else created the folder you are trying to access. Alternatively, some user account information may have changed even though your user account name and password have remained the same.

You can check the security settings for the item and, if necessary, take ownership of the folder. Right-click the item that's causing you problems and choose Properties. Select the Security tab and then click Advanced. Under the Permissions tab, go down to Permission Entries and check the information that's listed under Name. Look for Everyone and see if the permission type is set to Allow or Deny. If it's set to Deny, click Edit. In the Permission Entry dialog, clear any check boxes in the Deny column. Next, in the Advanced Security Setting for an item select the Owner tab. You can change the current owner to a specific user if you wish. Click Edit, select a new owner from the users listed, and then click OK. MPC

Ask the Doctor

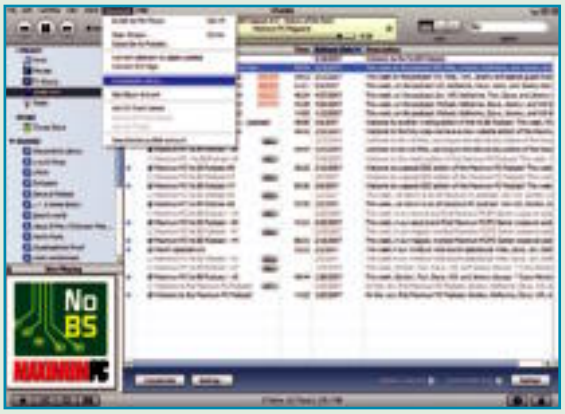
Diagnosing and curing your PC problems

MEMORY, ITUNES, WE'VE GOT IT ALL

First, I had a friend tell me that Windows Vista (32 bit) can access only 3GB of memory. Lo and behold, I have 4GB of RAM, yet Vista reports 2,814MB. What's the story?

Also, is there a way to move my song directory without wreaking havoc in iTunes? When I upgraded to Vista, I changed my directory from My Music to Music. ITunes lost the location of every song in my library, even after changing my music folder location within iTunes. I deleted all the songs from the library and then had iTunes add the songs again from my new directory. The problem is that all of my song ratings (which are integral to my iPod uploading) disappeared. Is there anything I can do in the future (aside from having to sort through thousands of songs to enter ratings again)?

—Gregory West



Consolidating your music library ensures that iTunes will save all of the data attached to your audio files, including those precious, precious star ratings.

Ahh, the Doctor's favorite question: Where's the RAM, Windows? In short, a 32-bit version of Vista will never use the full 4GB of RAM in your system. Never. Not happening. It's because of the memory mapped IO reservations, which control how the onboard memory on your installed devices overwrites parts of the system memory, which lowers the total memory available to Vista itself. According to Microsoft Knowledge Base Document 929605, the 32-bit version of Vista is limited to 3.12GB of total available memory. And the more devices you install, the lower this number gets.

As for your iTunes query, the answer is easier than you might think. Under the Advanced tab in the Preferences menu, check the "Keep iTunes Music folder organized" option (the Doctor does love how iTunes effortlessly databases your music), then select a new iTunes Music folder location by clicking on—you guessed it—the Change button.

Now that you have your new music location set up, it's time to move your files. Back out of the Preferences menu and click on the Advanced menu. Select Consolidate Library, and iTunes will copy all of the music in your library to the folder you previously specified. Note that the program is copying, not moving; to save some space on your drive, you can go back and delete the music from its original location.

WHERE'S THE WICKED WIRELESS?

With my 3Mbps cable Internet connection, I've been getting download speed test results of 2,500Mbps using my Linksys wireless-G router and adapter. I recently upgraded my cable connection to a 5Mbps connection. With my Apple PowerBook G4 built-in wireless-G Internet I get 4,500Mbps. With two different PCs (fast components and fresh installs of Windows XP) using Linksys wireless-G adapters I can get only about 2,500 to 3,000Mbps (with the most recent Linksys card versions and drivers). Why is there a difference in download speeds between my Linksys cards and my built-in Apple wireless? If I upgraded my cable connection to a 10Mbps connection would I just be wasting my money?

—Jeremy Toms

Well Jeremy, there's not really enough info in your letter to accurately diagnose your problem; it could be anything from your testing methodology to the location of the hardware to a poorly performing Wi-Fi adapter. You'll need to do some testing to determine what's causing the problem. First, you should evaluate your testing methodology. Make sure you're using the same version of Firefox on both the PCs and Mac and that you're testing the download speed from the same source when no other applications or users are on your connection. For a good speed test, the Doctor recommends Speedtest.net.

Next, you should see if there's a problem with your PC's location. Move your PowerBook to where your PC is set up and test the throughput there. If both machines are reporting slower speeds, you should move your router until it's in an area that delivers a better connection.

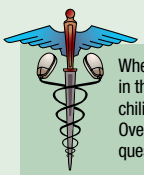
If neither of these things solves your problem, it's probably your adapter. Make sure your antennas are up and away from the computer, which is a major source of radio interference. With USB adapters, getting them away from the rig is easy; you just need a simple USB extension cable. However, PCI adapters are trickier; you'll need a custom cable—the type you need will vary based on the card you have. Judging by the price of these cables online, it may actually be more cost effective to buy a USB adapter.

RAID MINUS DRIVE EQUALS SAD

Many high-end rigs are sold with some sort of RAID system—striped, mirrored, or a combination of both. I have been told that if you have a striped setup and one drive fails, you're SOL. If that is true, is there any software that will help you recover from the failure? If you have a striped array and one drive dies, is retrieving your data as simple as unplugging the dead drive and plugging in a new hard drive of the same size or does the array need to be reconfigured? I inherited a RAID rig; it has four drives, and I think one or more of them are bad because I cannot boot to Windows. Any thoughts on how I can determine if the drives are faulty and get the rig up and running?

—Matt Conolly

By running RAID 0, you are, indeed, letting it all hang out because if one drive dies, you lose your data with it, and you would not be able to simply replace the dead drive with a working one and have the RAID come up. That's because there is no redundancy in a RAID 0 array. There are utilities such as Runtime Software's RAID Reconstructor that try to recover your data, but if one disk is gone, your chance of the program working is slim. You should boot your machine and go into the RAID's BIOS. It should let you know what kind of array you have and if it is in good health. The BIOS should also let you know which drive has failed and what port it is on. You can then look for the port on the card (they're usually numbered) and follow it back to the dead drive. Make sure, of course, that it's not just a cable that slipped out before you decide to junk it. MPC



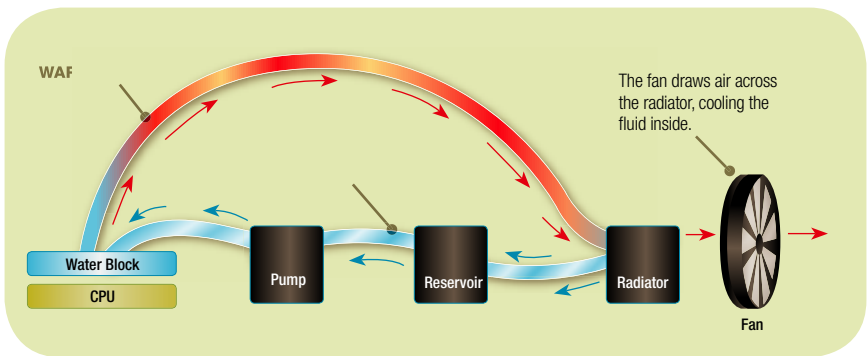
When the Doctor isn't busy working on your PC problems, he loves to sit back in the Maximum PC Lab and digest his favorite foods: cheese and crackers and chili peppers. The office seems to be overflowing with these foodstuffs whenever Overlord Will is around. Help the Doctor go on a diet by sending your computer questions to **doctor@maximumpc.com**. More work equals less dining.

White Paper: The Liquid-Cooled Computer

Fans not getting the cooling job done? Learn how the laws of thermodynamics affect your PC

BY ZACK **STERN**

HOW IT WORKS **COOLING A HOT CPU**



The pump draws cool liquid from the reservoir and pushes it over a water block clamped to the CPU's heat spreader. Heat transfers from the CPU to the water block and from the water block to the liquid, which is then pumped into the radiator. The cooled liquid then returns to the reservoir.

Modern PCs are hot, and not just in a trendy sort of way; the thin wires and tiny circuits packed into the space of a CPU, GPU, and other components generate significant heat. Without proper cooling, a CPU can rapidly achieve 350 C and start a fire in the process of burning itself out.

You're unlikely to pop a heatsink in the middle of use, however, and even if you did, systems are typically designed to shut themselves down long before going critical. But managing heat has a tremendous impact on your PC's performance. Pumping liquid through your machine can be a quieter and more efficient alternative to traditional air cooling.

BLOWING HOT AIR

Nearly all PCs stay cool enough to operate by using heatsinks and fans to maintain temperature. A heatsink is basically a hunk of aluminum, copper, or other metal with high thermal conductivity. Clamp the heatsink to the component to be cooled (with a thin layer of conductive thermal paste between the two to displace any insulating air in the tiny gaps), and as electricity warms it up, heat will transfer from the component to the relatively cooler heatsink. It's simply a matter of thermal dynamics.

The more surface area the heatsink possesses the more effective it will be at dissipating heat; that's why most heatsinks are manufactured with fins. Heat spreads over the surface of the fins and is transferred to the relatively cooler air surrounding it. In an active cooling scenario, a fan circulates fresh air around the heatsink.

Heatsinks and fans are the cooling status quo because they're cheap and effective. Overclockers seeking to wring every ounce of performance from their systems, on the other hand, look to other solutions—such as liquid cooling.

CARE FOR A COLD, FROSTY BEVERAGE?

The easiest way to boost your PC's cooling quotient is to add more fans, but the downside is that you also increase its noise level—a not-so-desirable trade-off. One way to get around this problem is to replace air with a more effective cooling agent: liquid. Ordinary tap water can transfer heat more efficiently than forced air, and there are plenty of more exotic and more effective liquids to choose from.

But liquid cooling has its drawbacks, too: Cost and complexity are the most common barriers, which is why so few mainstream PC manufacturers have gone down this road with their mass-produced products. Outfitting your own rig with a liquid-cooling system generally costs from $150 to $300 but can run much more than that. A failure—in the form of a leak or a kinked or clogged tube, for instance—can destroy a system in an instant. Maintenance is another issue that must be taken into consideration.

A liquid-cooled PC is a cyclical system that moves fluid over hot components, transferring that heat to the fluid, and then pumping the fluid away for cooling. In this type of system, a water block takes the place of a heatsink: It's clamped to the component in the same way and transfers heat from the processor to the thin copper or aluminum wall of the water block. From there, the heat passes to liquid coursing through tubing attached to the block.

This tubing carries the warmed liquid to a radiator, which transfers heat from the liquid into the air. A fan mounted in front of the radiator draws air over the radiator's fins, following the same principle as a heatsink, in order to increase the radiator's effectiveness. Most cooling systems use a centrifugal pump to forcibly circulate the fluid.

In more elaborate configurations, the liquid might pass through water blocks attached to other components—e.g., the graphics processor, the chipset, or even the RAM—before it reaches the radiator. As with an automobile's cooling system, an overflow reservoir provides a means of storing additional coolant to compensate for the inevitable evaporation. The reservoir also enables you to add coolant without introducing air bubbles into the system.

NAME YOUR POISON

Ordinary tap water is a good coolant, but more specialized liquids work better. Distilled water is one common choice: It's superior to tap water because it's not as corrosive to metal and it contains fewer of the biological agents that can foster an

algae colony. It also has fewer ions than tap water, rendering it less likely to cause a short circuit if your cooling system springs a leak.

Some people add ingredients to distilled water to increase its effectiveness. Surfactants, or wetting agents—basically, any substance that reduces the coolant's surface tension—may be the least important of these. In theory, a wetting agent allows the molecules within the cooling liquid to spread out and make closer contact with the water block. In practice, adding surfactants produces only negligible increases in cooling efficiency.

Even distilled water can become a prime algae habitat over time, however, and algae growth can severely degrade a PC cooling system. Pioneers tried general-purpose swimming-pool cleaners but soon discovered that these products—while very effective at killing critters—proved also to be highly corrosive. One bottle of a product such as HydrX (available online for about $2.50) mixed with purified water is a low-cost solution. Anti-corrosion additives, while more expensive, will lengthen the useful life of metal cooling components such as the water block. Zalman's G100 cooling liquid sells for about $20 per 500ml bottle.

Most fluid additives marketed for use with PCs are nontoxic, but we wouldn't advise taste-testing any of them. Users generally check and top off their PCs' distilled-water levels once a month and completely drain and refill their systems annually. There is minimal environmental impact associated with liquid cooling your PC because the materials involved are relatively benign and are nearly always highly diluted in distilled water. Exotic cooling products, such as 3M's Fluorinert, are a different matter: These should be taken to a hazardous-waste collection center for recycling or disposal.

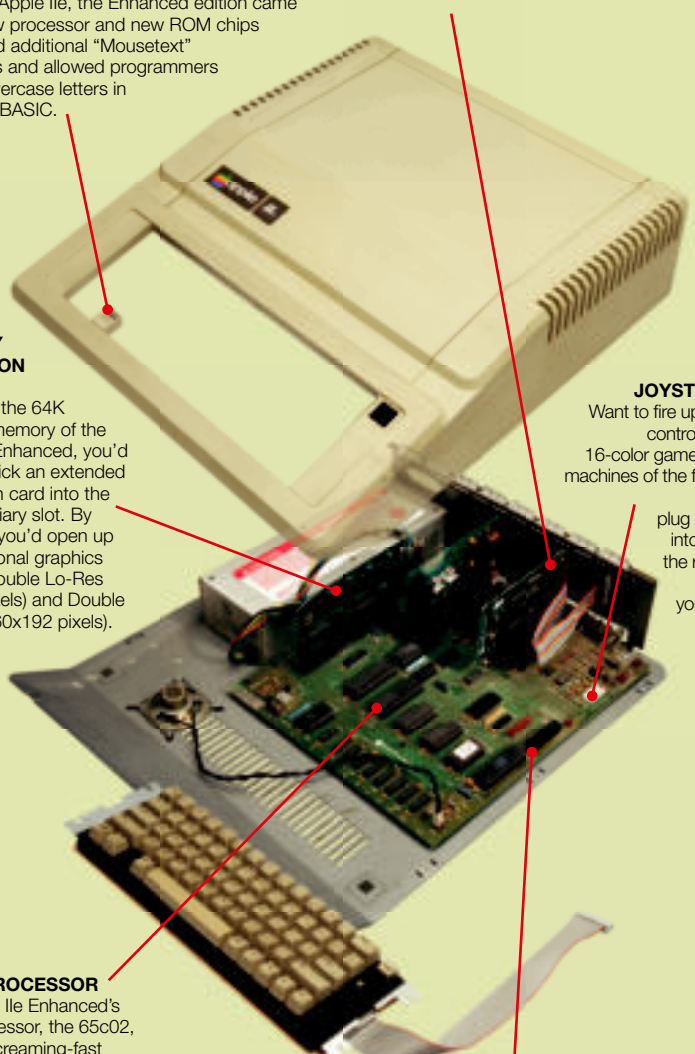
THE BIGGER CHILL

The PC enthusiast's adventures in cooling needn't end with liquids. A thermoelectric device, taking advantage of the Peltier effect, can absorb heat by passing current through the junction of two dissimilar metals. The hotter the material on one side becomes, the cooler the material on the other side ends up. The big drawback to Peltier devices, however, is that the rapid temperature change tends to cause condensation.

And if that still isn't exotic enough for you, try completely immersing your machine in liquid. The key is to use a dielectric (nonconductive) liquid that won't interact with the circuits. Vegetable oil is popular because it's cheap, but we won't be attempting such experiments any time soon. MPC

Apple IIe Enhanced

The Apple II was a gem, one of the company's best-selling models. But this is *Maximum PC*, so we're taking a look at the innards of the fancier version, the Apple IIe Enhanced.



I/O CONTROLLER
Talk about an external storage solution! Using Apple's I/O controller, you can connect two 5.25-inch floppy drives to your machine via a single 19-pin connector. The card itself connects to one of the motherboard's seven 50-pin bus connectors.

BUTTON
This button is a visual reminder of the upgrades Apple made to the IIe Enhanced. Nearly identical to the Apple IIe, the Enhanced edition came with a new processor and new ROM chips that added additional "Mousetext" characters and allowed programmers to use lowercase letters in Applesoft BASIC.

MEMORY EXPANSION SLOT
To double the 64K onboard memory of the Apple IIe Enhanced, you'd need to stick an extended 80-column card into the unit's auxiliary slot. By doing so, you'd open up two additional graphics modes: Double Lo-Res (80x48 pixels) and Double Hi-Res (560x192 pixels).

JOYSTICK INPUT
Want to fire up an external controller for some 16-color gameplay? Unlike machines of the future, which allow you to plug your joystick into the back of the rig, you have to connect your peripheral directly to the motherboard of the Apple IIe Enhanced.

65C02 PROCESSOR
The Apple IIe Enhanced's 8-bit processor, the 65c02, ran at a screaming-fast 1.02MHz. It replaced the original 6502 chip and fixed issues related to its eight system flags.

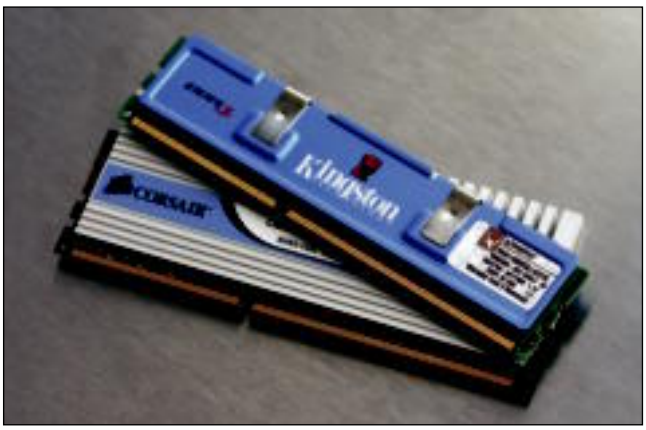
KEYBOARD INPUTS
The keyboard plugs into the motherboard using an IDE-style ribbon connector. As this rig featured fewer overall chips than its predecessor, there was enough room on the motherboard to include a connector for an optional 10-pin keypad connector.

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.**

GORDON **MAH UNG**

Tests DDR3 and Finds It Wanting

Get ready for the backlash



Corsair's and Kingston's DDR3 will set you back a pretty penny or two.

Stop me if you've heard this story before: A new memory technology offers increased bandwidth but adds the penalty of increased latency, and it costs more than twice as much as the RAM it's replacing.

You're right if you're thinking of Direct RDRAM, DDR, and DDR2. All faced teething pains and the usual griping that "X RAM is already good enough! Why mess with it?" After testing DDR3 in our Lab for a week, I can tell that the same old problem will be one of the biggest hurdles that the new RAM faces.

DDR3 will initially be offered in speeds from DDR3/800 to DDR3/1600, use less power (1.5 volts versus DDR2's 1.8 volts), and come in 240-pin DIMMs. The DDR3 DIMMs, however, are keyed, so they will not fit in DDR2 slots. DDR3 increases bandwidth by prefetching eight bits of data whereas DDR2 prefetches four bits and DDR prefetches two bits.

We put a DDR3-based Asus P5K3 mobo up against two DDR2 boards, Asus's P5K and MSI's nForce 650i SLI. We tested DDR2/800 and DDR2/1066 against DDR3/1066 and DDR3/1333. The upshot? At best, the P5K3 board had no real-world performance advantage and, at times, its latency was painful. In Valve's Particle Test benchmark, which is particularly latency sensitive, the DDR3/1333 was at the bottom of the heap, with times running about 25 percent slower than DDR2's. But to be fair, one aspect of DDR3 does look promising: high clocks will be available really soon. We had our Corsair and Kingston DDR3 modules running way past spec at DDR3/1500 speeds, so we expect DDR3/1600 to be right around the corner.

But then you get to price. While 2GB of DDR2/1066 will set you back $150 to $200, 2GB of DDR3/1066 costs $410 and DDR3/1333 costs $460. A massive cost increase for what amounts to a performance penalty? Normally, this would have people screaming bloody murder about RAM industry conspiracies and Intel execs smoking stogies in backroom deals, but I'm not getting my blood pressure up over it.

While I don't recommend DDR3 today for most people, the prices and latencies will come down and the clock speeds will go up. In 18 months, people won't even remember this conversation; they'll just be complaining about DDR4 prices.

Katherine Stevenson

Retests HP's LP2465

And sees a marked improvement as the result of her original review

Back in September 2006, I reviewed HP's LP2465 LCD and found the display to be flawed. The trouble first surfaced when I ran a utility called Pixel Persistence Analyzer (**www.benchmarkhq.ru/english.html?/be_monitor.html**). A stream of animated images that should have moved smoothly across the screen was instead disrupted by a regular stutter. When I noticed similar glitches in our game tests, I had no choice but to give the LCD a lowly 4 verdict.

In a move that we don't often see as hardware reviewers, HP reps have since kept me apprised of their ongoing efforts to fix the monitor. This month I received an updated LP2465 that features a firmware fix for the aforementioned issue. In short, the original panel could only receive vertical sync output that was at or very close to 60Hz, while videocards often output a signal with more variance (anywhere from 58-61Hz). Thus, the monitor's scalar would add or remove video frames in order to compensate for the changing signal that created the image stutter. The fast-paced animated images in our utility happened to highlight this effect—it's not something you would experience in most desktop applications, or even movies, which is why HP's QA team was previously unaware of it. With the firmware fix, the scalar's "frame rate control" is disabled when incoming vertical sync is between 58 and 61Hz. And sure enough, the Pixel Persistence Analyzer test screens look just as they should on the latest version of the LCD, as do all other forms of content, making the LP2465 a monitor we're now comfortable recommending.

The fix went public at the end of January 2007 and is present in all LCDs manufactured since that time. LCDs produced prior to that period can be returned to HP for a replacement.

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.

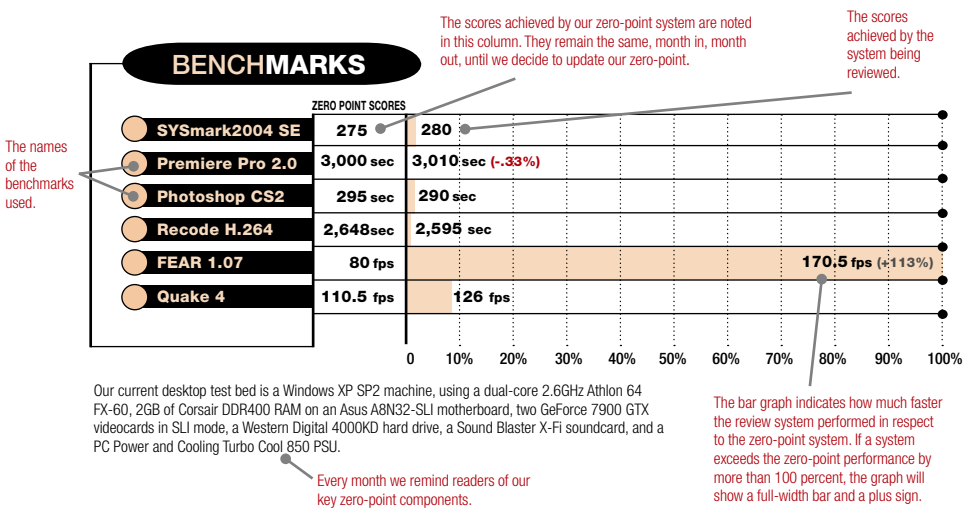
Ahead Nero Recode 2.0: Nero Recode 2.0 is one of the fastest video-transcoding utilities. We copy unencrypted VOB files to the hard drive, then convert the movie to an H.264 file formatted for the Apple iPod's screen. The version included with Nero 7.5, is the only multithreaded H.264 encoder we've found 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
XFX GeForce 8800 Ultra
Finally, an Ultra card worthy of the moniker

Midrange videocard
PowerColor HD HD2900 XT 512MB DDR3
Outpacing the 8800 GTS by a healthy clip, the Radeon deserves the midrange crown

Soundcard
Creative Labs X-Fi Xtreme Music

Hard drive
Hitachi Deskstar 7K1000

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

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: Lord of the Rings Online: Shadows of Angmar, Test Drive Unlimited, S.T.A.L.K.E.R.: Shadow of Chernobyl, Command & Conquer 3: Tiberium Wars, Oblivion IV: Shivering Isles

PowerColor Radeon HD 2900 XT

AMD trots out its second-gen unified shader architecture

Need to capture analog video? The HD 2900 XT is outfitted with VIVO (video-in/video out), a feature Nvidia doesn't offer in its better cards.

Having designed the graphics architecture for Microsoft's Xbox 360, ATI's management had boasted for months ahead of its acquisition by AMD that its engineers were experts at designing the type of unified shader architecture envisioned by DirectX 10. Imagine our surprise when the R600 not only hit the market several months after Nvidia's take on unified architecture but that the company's best offering can't compete with Nvidia's top *two* GPUs.

AMD, for its part, says not competing with Nvidia at the high end is all part of its master plan, that it would rather focus on the "mainstream" graphics market, where most people are actually buying new videocards. And so it has positioned the ATI Radeon HD 2900 XT in this PowerColor card to compete with cards based on Nvidia's GeForce 8800 GTS with 640MB frame buffers. If you believe that, we've got some prime real estate in Afghanistan you might be interested in. No, we're convinced AMD ran into some design problems that it just could not resolve.

The Radeon HD 2900 XT is a power-hungry beast, demanding both six-pin and eight-pin connectors from your PSU in addition to what it draws from the PCI Express slot.

SPECS

	RADEON HD 2900 XT	GEFORCE 8800 GTS
NO. OF SHADER UNITS	320	96
CORE CLOCK SPEED	743MHz	500MHz
SHADER-UNIT CLOCK SPEED	743MHz	1.1GHz
FRAME BUFFER	512MB	640MB
MEMORY SPEED	828MHz	800MHz
MEMORY INTERFACE	512-bit	320-bit

The Radeon HD 2900 XT is indeed faster than Nvidia's 640MB 8800 GTS (but not the insanely fast 8800 Ultra or the only slightly tamer 8800 GTX). It's also street-priced about $50 higher—but that's about what we'd expect from the faster component. What we *didn't* expect is a GPU that sucks down nearly as much electrical power as an 8800 Ultra while delivering benchmark results that are about 50 percent lower. (The HD 2900 XT requires both a six-pin *and* an eight-pin cable connection to your power supply.)

Power consumption isn't something you think about every day, but with energy prices soaring, you should know that our test rig (see the footnote in our benchmark chart) draws 175 watts from the wall with a single Radeon HD 2900 XT at idle. That number jumped to a shocking 318 watts while benchmarking Quake 4 and increased to a staggering 515 watts when we dropped a second card in our Bad Axe II motherboard for CrossFire testing. A single 8800 Ultra, for the sake of comparison, sucked down 192 watts at idle and 320 watts under load in the same motherboard.

Another glaring problem with the 2900 XT is the absence of any driver support for AMD's new Unified Video Decoder, which is designed to deliver hardware support for high-definition video decoding. Without UVD support, the 2900 XT must rely on the host CPU to handle much of this workload. To be fair, none of Nvidia's 8800-series cards feature that company's second-generation PureVideo HD engine either (you must step down to the GeForce 8600 to get it), but at least Nvidia has the excuse that its faster designs are several months older than the 8600.

It's also interesting to observe that the 2900 XT is considerably slower than either the 8800 GTX or the 8800 Ultra, despite having 2.5 times as many stream-processors (320 compared to 128). This fact, combined with AMD's FUBAR driver support for UVD and the card's massive power footprint, strengthens our opinion that the 2900 XT is just not what AMD intended.

Those foibles aside, this card boasts some impressive architecture, including a true 512-bit memory interface (the best Nvidia can offer is a 384-bit interface, and that narrows to 320 bits for the 8800 GTS that this card competes with). The chip also has a built-in programmable tessellation unit—again, based on technology already present in the Xbox 360—but this feature

BENCHMARKS

	GEFORCE 8800 GTS	SINGLE POWERCOLOR	POWERCOLOR IN CROSSFIRE
3DMARK06 GAME 1 (FPS)	20.8	**21.5**	41.9
3DMARK06 GAME 2 (FPS)	19.6	**20.6**	41.9
QUAKE 4 (FPS)	65.6	**75.7**	127.8
FEAR (FPS)	51.0	**63.0**	111
SUPREME COMMANDER (FPS)	24.3	**28.8**	38.9

Best single-card performance scores are bolded. Cards were installed in an Intel D975XBX2 motherboard with a 2.93GHz Intel Core 2 Extreme X6800 CPU and 2GB of Corsair DDR2 RAM.

won't be of much real-world use until it's exposed in DirectX 10 (or will that be DirectX 11… or 12?). But getting back to the real world, the fact that the stream processors in Nvidia's part are clocked at more than twice the speed of its core didn't help the 8800 GTS outrun the 2900 XT: PowerColor's product delivered single- and dual-card benchmark numbers that were 15- and 25-percent higher than what equivalent 8800 GTS configurations could produce.

The 2900 XT, of course, supports CrossFire—AMD's technology for operating two videocards in a single PC. And as with the latest spins of the X1000 series, the master/slave concept has been eliminated: All HD 2000 series GPUs have a compositing chip baked right into the silicon. AMD has also jettisoned the external cables that previous-gen CrossFire cards used for communication—replacing them with simple ribbon cables that fit inside the case. As with Nvidia's SLI technology, however, you can operate only one display while in dual-videocard mode.

Two of PowerColor's HD 2900 XT cards running in CrossFire are indeed faster than a single 8800 Ultra, but a pair of those cards will cost you slightly more than a single Ultra. And if you swing Nvidia's way, you can always drop in a second Ultra for even more insane performance (turn to page 80 for our review of the XFX 8800 Ultra XXX Edition).

It would be easy to dismiss this card as a whiff, but it's really not a bad product, and it'll be a whole lot better if AMD can unlock its UVD circuits.

—MICHAEL BROWN

POWERCOLOR RADEON HD 2900 XT

8

BATTLE-AXE (WEAPON)

There are some good bones in this architecture.

BATTLE-AXE (WIFE)

The ratio between power draw and performance is way out of whack; no driver support for HD-video decode in hardware.

$450, www.powercolor.com

Overdrive PC Core2.SLI

Dual core still rocks on

Overdrive PC is betting an overclocked dual core will beat a quad-core rig.

One thing we respect about Overdrive PC is that it's never predictable. These guys seem to always take the path of most resistance.

In this case, Overdrive PC has constructed a rig whose sole purpose seems to be smashing our benchmarks. The company's theory: Why go with a quad-core setup when you can push a dual core to higher speeds and guarantee stability? Since the overwhelming majority of applications aren't multithreaded for quad core, why not push the hell out of a dual core?

That's the course OPC took with the Core 2.SLI. The company overclocks Intel's newly minted 3GHz Core 2 Duo E6850 to 3.8GHz by cranking the chip's stock 1,333MHz front-side bus to 1,900MHz. Forgoing the quad cores also simplifies cooling needs—it's all air here, baby! There's no need for exotic (and perhaps leaky) water cooling and it's pretty darn quiet to boot. The rig's Patriot DDR2/1066 RAM gets a workout as well with a bump up to 1,250MHz. OPC also snagged a pair of GeForce 8800 Ultras, the fastest GPUs on earth. Of course, true to form, OPC also takes the cards' GPU and RAM speeds up. That in itself tells you about OPC's technical prowess. While civvies aren't allowed to overclock the stream processor on the 8800s, those laws apparently don't apply to OPC. But we'd expect nothing less from a system vendor that goes as far as tweaking the BIOS on the EVGA 680i SLI board with its own settings and profiles.

Most of Overdrive PC's magic can't be seen in pictures.

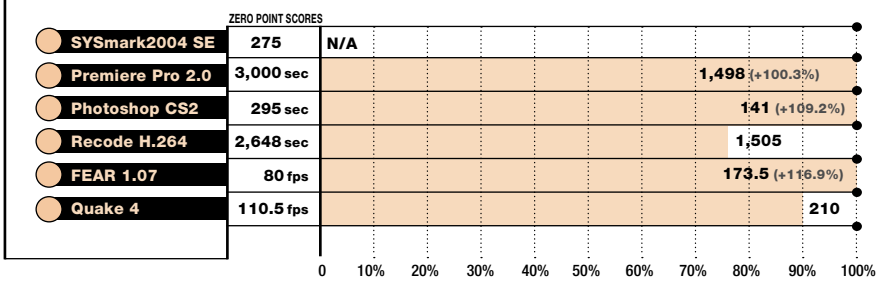
So how does OPC's gamble pay off? Can a dual core really compete in the quad-core era? First, the good news: In our GPU-limited FEAR gaming test, the Core2.SLI vaults over the previous record by a massive 15 percent. Unfortunately, not all games are graphics bound. In the multithreaded Quake 4 test, both the CPU and GPU count, and the Falcon Northwest Mach V we reviewed in June continues to hold the record at 226fps versus the 210fps of the Overdrive.

The Core2.SLI tied for the top score in our Premiere Pro 2.0 HDV test (held by the 3.73GHz quad-core Mach V we reviewed in June) and also our Photoshop CS2 test (held by the 3.46GHz quad-core Digital Storm Twister Ultra 4 we tested in July). So, are those two other cores really just freeloading bastards after all? Well, maybe not. In our Nero Recode 2.0 test, in which we encode an MPEG2 file to H.264 for the iPod, the dual core can't hang. The Twister Ultra 4 holds the record at 1,249 seconds, while the Mach V takes a close second at 1,315 seconds. The Core2.SLI, while fast at 1,505 seconds, is out of contention. As a comparison, the stock 2.66GHz Polywell quad core we reviewed in March was slightly slower at 1,653 seconds. The story would be the same in any multithreaded encoding test, which makes us wonder if dual core is the right way to go.

That, ultimately, is the prickly problem that will haunt the Overdrive configuration. As more apps and games adopt multithreading, will you wonder if you should have bought a quad core? In Overdrive's favor, however, is the fact that it is a smokingly fast gaming machine. In 90 percent of today's games, we can easily say that the Core 2.SLI will kick ass over all other comers. However, as that 10 percent grows, so might your regrets.

—GORDON MAH UNG

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.

OVERDRIVE PC CORE2.SLI

COPS

Damned quiet and damned fast in gaming.

RENO 911!

Lack of quad-core support will hurt future performance.

9

$7,250, www.overdrivepc.com

UNDER THE HOOD

BRAINS	
CPU	Intel Core 2 Duo E6850 (3GHz overclocked to 3.8GHz)
MOBO	EVGA 680i SLI
RAM	2GB Patriot DDR2/1066 (Two 1GB sticks)
LAN	Dual Gigabit LAN (Nvidia)
HARD DRIVES	Two 150GB Raptors (10,000rpm SATA) in RAID 0
OPTICAL	Plextor PX-755SA
BEAUTY	
VIDEOCARD	Two GeForce 8800 Ultras in SLI mode (662MHz core, 1,200MHz RAM)
SOUNDCARD	Sound Blaster X-Fi Fatal1ty Edition
CASE	Cooler Master CM Stacker 830 Enermax Galaxy 1000 PSU
BOOT: 50 sec.	DOWN: 30 sec.

March of the Midsize LCDs

The 22-inch screens just keep on coming. Is this a good thing?

Samsung's 226BW is just like all the other 6-bit panels we've reviewed—mediocre.

In our June issue, we looked at a trio of 22-inch LCDs and concluded that their bargain price tags came at the cost of image quality. All three of the screens sported 6-bit color with frame-rate control (FRC), which is intended to simulate 8-bit color performance at a lower cost, but we found them inferior to our favorite 8-bit panels. This month, we look at two more 22-inch models to determine whether the category is a complete wash.

—KATHERINE STEVENSON

HANNS.G HW223DPB

An LCD's spec sheet isn't likely to mention the use of 6-bit color with frame-rate control; it's up to you to deduce it. In some cases, you'll find that the color spec isn't even mentioned. This in itself can be a clue, but it's not proof—dig further. If a spec is mentioned, bear in mind this distinction: An 8-bit panel is capable of producing 16.7 million colors; a 6-bit panel produces just 262,144 colors but uses FRC to create approximations of more, up to 16.2 million shades.

Newcomer Hanns.G doesn't make much of an impression with its HW223DPB.

Hanns.G's HW223DPB bears the telltale 16.2 million color spec. Granted, that's a whole lot of colors, and we really can't say this LCD is incapable of producing many, many distinct shades. In our high-res digital test photos, fine detail was accounted for, as were various subtle transitions in shades, and there were no signs of dithering—the obvious that often results from a limited color palette. But as we observed in our last batch of 22-inch screens, the overall picture was less rich and vibrant than what we've seen on high-end LCDs. Even more troublesome was the poor off-axis visibility. The picture is optimal at direct eye level, with some detail loss occurring at even the lower half of the screen. When we looked down on the screen from a standing position, the diminished picture quality was especially startling. When viewed from the side, there was a loss of contrast and lighter colors took on a yellowish cast.

The HW223DPB is labeled as "HD ready," but the display was incapable of displaying a commercial high-definition disc from our Blu-ray drive. It turns out the tag refers to the screen's ability to play 1080p content via an included component-to-DVI cable—in other words an analog stream from, say, a console or set-top disc player. HDCP is not supported. Frankly, we wouldn't buy any device that requires us to trust that analog streams will remain unregulated by content providers.

The HW223DPB's cabinet is unremarkable in looks and adjustment options (it has only forward and back tilt), but it does come with four built-in USB ports and the onscreen display options are well rounded. This LCD is tied with Dell's E228WFP (reviewed in June) as the least expensive 22-inch screen we've tested, and of the two, Dell's is the better option.

SAMSUNG 226BW

Initially we thought Samsung's 226BW might rise above the pack in the 22-inch category. This LCD boasts 16.7 million colors, suggesting superior 8-bit technology. But when we did side-by-side testing next to the Hanns.G model, we were mightily surprised by the similarities. Sure enough, further inquiry revealed the 226BW to be a 6-bit panel just like all the others. But Samsung says its special Hi-FRC tech surpasses conventional FRC in color reproduction.

Be that as it may, we observed the same poor vertical off-axis visibility evident in other 6-bit panels (although horizontal off-axis was somewhat better), and the 226BW's grayscale performance was actually weaker on the light end of the scale than the Hanns.G's.

The $100 premium Samsung charges over Hanns.G's model gets you fancier trim and HDCP support. Like the Hanns.G, the picture is serviceable—but nothing special—and the screen is free of any image artifacts in games.

HANNS.G HW223DPB

BANANA BREAD
Inexpensive, good grayscale performance, OK for gaming.

BANANA SLUG
Bare-bones build, poor vertical off-axis, no HDCP.

6

$330, www.hannsg.com

SAMSUNG 226BW

POTATO CHIPS
Inexpensive, OK for games, supports HDCP.

POTATO BUG
Limited ergo options, poor vertical off-axis, so-so image.

7

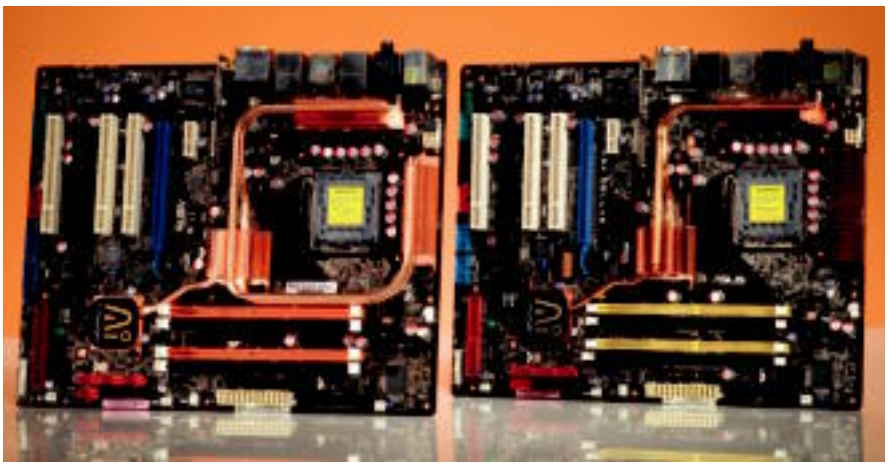
$430, www.samsung.com

SPECS

	Hanns.G HW223DPB	Samsung 226BW
NATIVE RESOLUTION	1680x1050	1680x1050
INPUTS	DVI, VGA, 4 USB, Audio-in	DVI, VGA

A Tale of Two Memories

DDR3 is here. Is it worth the price?



On the left is the DDR3-based Asus P5K3 Deluxe; the DDR2 version, the P5K Deluxe, is on the right.

You may not be aware of it, but Asus didn't get its bad mofo image for nothing. Able to execute on new chipsets with Terminator-like precision, the company usually beats the competition to market by weeks, if not months. So it was no surprise when a pair of Asus boards using Intel's new P35 chipset arrived at our door well before anyone else's.

The P5K Deluxe and P5K3 Deluxe are almost identical, save for two features: The P5K3 has a slightly bigger heat pipe and the two boards utilize different memory technologies. Asus knows that while DDR3 will generate oohs and aahs, it's also almost twice as expensive as DDR2. The DDR2-based P5K Deluxe is a hedge against the price backlash.

Both boards are loaded with features. They use Intel's new P35 chipset and ICH9R south bridge, which brings official 1,333MHz CPU front-side-bus support to Core 2 users. Also included are beefy heat pipes, dual-gigabit NICs, a pair of eSATA ports, onboard 802.11g Wi-Fi, and a pair of x16 PCI-E slots. The chipset and board are aimed at high-end users but not the ultra-enthusiast market, so one of the x16 PCI-E slots signals at a mere x4 speed. Because this is an Intel chipset, SLI is out, but AMD's CrossFire mode is an option. In the good column, both boards use an Analog Devices audio chipset for onboard audio instead of the inferior RealTek codecs found on most boards today.

The real meat here is the DDR3 controller. Intel says the updated controller on the P35 includes fast memory technology to reduce latency and increase available bandwidth. Intel's Robson caching technology, now called Turbo Memory, can also be activated, but we don't know where the flash memory is for the feature. It's certainly not soldered onto either motherboard.

We compared both boards to an MSI P6N SLI Premium using the nForce 650i SLI chipset. All boards used the same components and drivers. Our verdict? Our enthusiasm for these newcomers is tempered by merely good performance. For the DDR2 board, we expected the updated memory controller to outrun Nvidia's nForce 650i SLI, but the Nvidia board did quite well. The nForce board aced both Asus boards in the synthetic memory tests at stock RAM speeds. However, in more practical tests, the performance gap was nil, and the P5K actually pulled ahead in our FEAR tests, which we've seen nForce lose before. The DDR3-equipped P5K3 was more of a disappointment, though. As expected, the high latency of the DDR3 memory generally put this board in last place, and the latency takes up to a 25 percent hit when running in DDR3/1,333. Ouch. (For more on DDR3 testing, see In the Lab on page 66.)

So should you buy either of these boards? Today, the DDR2 P5K makes a lot of sense. You get very good performance and the safe embrace of an Intel chipset for a decent price. Instead of spending money on DDR3 now, you could buy a faster graphics card or bigger hard drive. Don't write off DDR3 completely however. We were able to overclock the RAM we used up past 1,500MHz, which is impressive since we couldn't get the P5K to run DDR2/800 at 1,333MHz. Still, it's just too early for DDR3. The story will be different next year, but for now, DDR3 is only for people with a taste for champagne and caviar.

—GORDON MAH UNG

BENCHMARKS

	MSI P6N SLI PREMIUM	ASUS P5K DELUXE	ASUS P5K3 DELUXE
CHIPSET	Nvidia nForce 650 iSLI	Intel P35	Intel P35
RAM SPEED	DDR2/ 800MHz	DDR2/ 800MHz	DDR3/ 1,333MHz
SISOFT SANDRA XI (MB/S)	**6,541**	6,175	6,405
SCIENCEMARK 2.0 (MB/S)	**6,316**	6,279	6,243
3DMARK2001 SE OVERALL	**37,035**	36,564	36,338
3DMARK2003 OVERALL	**24,025**	23,952	23,937
3DMARK2005 OVERALL	**11,169**	11,110	11,094
3DMARK2005 CPU	8,791	**8,795**	8,768
PC MARK 2005 OVERALL	**7,211**	7,049	6,978
PC MARK 2005 CPU	**5,985**	5,982	5,941
PC MARK 2005 RAM	**5,525**	5,437	5,417
VALVE PARTICLE TEST	40	**41**	31
FEAR 1.07 (FPS)	198	**216**	199

Best scores are bolded. We used a 1.86GHz Core 2 Duo E6300 overclocked to 2.33GHz on a 1,333MHz front-side bus, 2GB of Corsair DDR2 and 2GB of Corsair DDR3, a WD GD740 drive, a GeForce 7900 GTX, a 1KW PC Power and Cooling PSU, and Windows XP Professional. Intel boards were tested with AHCI modes enabled.

P5K DELUXE WI-FI EDITION

RDRAM

Fairly fast and includes the safety net of a reliable Intel chipset.

QDR

Nforce chipsets still faster and support SLI.

8

$220, www.asus.com

P5K3 DELUXE WI-FI AP EDITION

PC100

DDR3 support at last! Guaranteed Penryn-ready.

FB-DIMM

Ridiculous DDR3 pricing and latency.

6

$240, www.asus.com

Old-School Optical

We revisit DVD burners while we wait for the next-gen market to mature

The Asus DRW-1814BLT's performance is as exciting as its looks, if you know what we mean.

While we've been biding our time, waiting for next-gen burners to become worth a damn, *Maximum PC*'s official recommendation in the plain-old-DVD-burner camp has gotten pretty stale—Plextor's PX-755SA isn't even made anymore (although you can still find it). That's why we're taking a fresh look at some old tech. Because let's be real: It could take a year or more for the next-gen scene to shape up, and standard-def burners are cheap enough that you can buy a model that's better and faster than the one you have now to tide you over.

One of the things that makes the PX-755SA stand out is its SATA interface. With just one parallel ATA port on most motherboards these days, moving the optical drive to SATA is imperative. With that in mind, we pulled a pair of SATA optical drives into the Lab for a good old-fashioned throwdown.

—KATHERINE STEVENSON

LITE-ON LH-20A1S

When we last looked at DVD drives, the top write speed for DVD+/-R media was 16x. Lite-On's LH-20A1S bests that (as well as today's prevailing 18x speeds) with a 20x burner. What does that 20x net you when only 16x media currently exists? Well, if you're using fancy—and hard to find—Taiyo Yuden media, which is what shipped with our drive, the LH-20A1S indeed excels. It wrote 4.38GB of data to a single-layer DVD+R disc in a speedy 5:06 (min:sec), with an average speed of 14.66x (the drive peaked at 19.06x). Using Verbatim media, however, Lite-On's drive was on par with our old fave, Plexy's PX-755SA, with an average write speed of 12.07x and a 5:49 write time. What struck us as unusual in tests with both types of media was the drive's 88-percent-plus CPU utilization during 8x disc reads (the highest our Nero CD-DVD Speed utility reports on). This is more than double what most drives report.

The LH-20A1S is rated at 8x for double-layer media, and it took 17:56 to write 7.96GB of data to DVD+R DL—not the best time we've seen, but respectable. The drive comes bundled with Nero 7 Essentials and offers LightScribe for direct disc labeling, DVD-RAM support, and an extra bezel (white), so your drive can change outfits.

Lite-On can lay claim to the "world's first" 20x DVD burner, but the honor doesn't mean all that much.

LITE-ON LH-20A1S

COKE CLASSIC
Fast writes with select media; useful extras.

COCA-COLA BLAK
CPU load concerns us.

7

$55, www.liteonit.com

ASUS DRW-1814BLT

Despite its relatively slower DVD+/-R write speed of 18x, Asus's burner turned in a better time than Lite-On's entry when writing 4.38GB of data to a single-layer DVD+R disc, at least when using Verbatim media: The DRW-1814BLT enjoyed a 13-second lead with a write time of 5:36 (min:sec). Interestingly, with Taiyo Yuden media, Asus's drive was slower than its competitor, taking 6:01 to fill that disc. Because Verbatim media is easier to come by, we're giving that score more weight, but consider this point a caveat. The CPU utilization during reads of both discs was below 30 percent.

In our double-layer burn test, the DRW-1814BLT, which is rated for 8x with DVD-DL media, took an acceptable 18:08 to write 7.96GB of data to Verbatim media, with a 6.66x (should we be scared?) average speed. Asus, like Lite-On, tosses in Nero, LightScribe, and DVD-RAM support, but no extra bezel.

All in all, the two drives are pretty close, but we're more comfortable with the Asus's CPU usage during disc reads.

ASUS DRW-1814BLT

STAR TREK: TOS
Acceptable, if average, performance; useful extras.

STAR TREK: ENTERPRISE
A middling product; lower burns with "select media."

8

$50, www.asus.com

BENCHMARKS

	LITE-ON LH-20A1S	ASUS DRW-1814BLT
DVD+R WRITE SPEED	12.07x	**12.76x**
AVERAGE DVD+R READ SPEED	**12.18x**	12.16x
AVERAGE ACCESS TIMES (RANDOM/FULL)	125/200ms	117/210ms
CPU UTILIZATION (8X)	88%	**26%**
DVD+DL WRITE SPEED AVERAGE (MIN:SEC)	**6.78x**	6.66x

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.

The Great NAS Box Transfer-Off

If you aren't using an Ethernet cable for your external storage boxes, you just aren't cool

It's a bit ugly, but Hammer's Myshare gets the job done with simple, unabashed speed.

We very much appreciate the work internal hard drives do to give us additional space for our games, home movies, and cat pictures, but the days of stuffing all our storage into a case have long since passed. Connected external drives are just the tip of the iceberg, however, as we're looking at the real gems this month—network-attached storage devices.

WESTERN DIGITAL MY BOOK WORLD EDITION II

We fondly recall reviewing this unit's connected brother in arms, the My Book Pro Edition II (March 2007). The products are virtually identical, featuring two 500GB hard drives locked in a RAID 0 configuration that gives you one honkin' terabyte of space. The difference, of course, is that you access the World Edition II through an Ethernet cable instead of a FireWire or USB connection.

If you enjoy holding down a power button for more than 20 seconds just to shut off a device, you'll love WD's My Book World.

A little piece of software called MioNet serves as the gateway between your computer and this NAS box. We love how it effortlessly allows you to share folders from your My Book with anyone you want via an awesome web-based interface. But that's all it does unless you want to open up your wallet. Yes, that's right, to share folders that are on your computer and access other functions, like remote login to any PC with MioNet installed, you have to pay the piper—$7 a month or $65 a year. Say it slowly now: What. The. Hell.

Worse still, we have good reason to believe that MioNet cripples the My Book's performance. It takes the My Book forever to load up and be recognized by the program, and sometimes the connection doesn't even occur. For some strange reason, the drive won't show up in Windows Explorer but will be accessible through the Manage Devices option in MioNet.

Considering it took an average of 12:42 (min:sec) to transfer 3.6GB (475 files), we remain thoroughly unimpressed with the My Book World. A pity, really; we had such high hopes.

HAMMER STORAGE MYSHARE

When we first got the Myshare into the Lab, we were a bit taken aback by its simplicity. There's no fancy software to accompany the 500GB device; it's actually two 250GB drives striped using RAID 0. If you want to access the Myshare, you have to go through Windows Explorer, just as you would with any other network drive.

This route might be less sexy than a software-themed interface, but man, does it work. We nearly spit on the ground with joy when the Myshare was loaded and ready to go in less than 10 seconds—a far cry from the agonizingly slow Western Digital device previously reviewed. And in our highly scientific "transfer a lot of stuff" test, we were able to toss over a 3.6GB chunk of files in an average time of 5:13 (minutes: seconds). That, dear readers, is awesome.

Admittedly, 500GB of space isn't a groundbreaking achievement in storage. But that's just what this edition of the Myshare offers; Hammer Storage is already selling versions with up to 1.5TB of space, and a 2TB edition should be ready by the time you finish reading this very sentence. Have fun transferring every file you have to the device. You won't even need an entire weekend to do it.

WESTERN DIGITAL MY BOOK

NELLY
MioNet has some pretty amazing features, and the My Book has a wonderfully simple exterior.

R KELLY
You have to pay *how* much for services that are easy or free to implement?

5

$500, www.wdc.com

HAMMER STORAGE MYSHARE

INTEGERS
Speedy transfers, can share printers using the device, automatic USB-based backup, loads quickly.

NATURAL NUMBERS
Web-based interface might be tricky for newbs. Nothing pretty to look at.

9

$350, www.hammer-storage.com

AeroCool PowerWatch

Everything but the kitchen sink… and FireWire and eSATA

Don't discount the mighty alarm on the PowerWatch; 'tis an ear-splitter, it is.

At first glance, AeroCool's PowerWatch front-panel display looks like every computer enthusiast's worst nightmare. Admittedly, the display itself is pleasing to the eye, but the back of the device looks like two octopi trying to leg wrestle. It's a tangled mess of cords, cables, connectors, and prongs that's sure to bring ruination to anyone's wire-hidden case.

But if you can stomach a bit of extra work to make your rig's insides look pretty, the PowerWatch makes for an awesome addition to your case. Hardware-wise, the PowerWatch comes with two PoweredUSB ports—enhanced USB ports that deliver extra juice to USB devices that might otherwise require a power brick. Of course, there's a catch. PoweredUSB was developed independently of the USB Implementer's Forum, and we have yet to test a single device that uses the rebel port. But you can still plug in normal USB devices, and the PowerWatch also comes with front-panel support for a bazillion different memory cards: CF, SM, MS, SD, and others.

The real meat of the PowerWatch is its glowing information panel, a multicolored, circular LCD that is the brightest display we've seen in quite a while. From a variety of angles, you can clearly see critical information displayed on the panel, which is broken into three sections: alarm temperatures, fan speeds, and component temperatures.

Our biggest criticism of the PowerWatch stems from how it collects this information. While fan speeds come from a typical three-prong connector, the device relies on thermal probes for all of its temperature measurements. If you've ever worked with one of these little plastic devices, you'll understand our frustration; the probe has to be placed with great precision, and even then its readings aren't the most accurate imaginable. Still, even a janky probe is better than nothing, so we can't fault AeroCool *that* much.

Although we still question what one might use the PoweredUSB ports for and wish that AeroCool would have provided more connectors than just simple USB (eSATA or FireWire for starters), this is still one of the finer front-panel accessories we've seen.

—DAVID MURPHY

AEROCOOL POWERWATCH **8**

$75, www.aerocool.us

XFX 8800 Ultra XXX Edition

If you have a Corvette, do you need a Ferrari?

Yes, the 8800 Ultra XXX is fast. It's also crazy expensive and stupid noisy.

ATI and Nvidia have long entertained us with their game of GPU one-upmanship. Each time ATI thought it had a part that could beat Nvidia, Nvidia moved the goalposts. But now that ATI has been reduced to an AMD brand, it seems its engineers no longer want to play.

Nvidia's 8800 GTX was already the fastest consumer GPU on the planet, so what does the 8800 Ultra get you? Virtually the same hardware running at higher clock speeds—insanely higher clock speeds in the case of XFX's XXX Edition. Although Nvidia tells us this is new silicon—and not merely hand-selected parts that proved capable of running at higher clock speeds—the Ultra has 128 stream-processing units and a 384-bit interface to 768MB of memory, just like the older part. It also has a much larger fan to handle the resulting heat.

The core on a stock GTX runs at 575MHz (with its actual shader units clocked at 1.2GHz), and its memory hums along at 900MHz. A stock Ultra is spec'd to run at 612MHz (with a 1.5GHz shader clock), and its memory runs at 1.08GHz. XFX has goosed those rates even higher, cranking its Ultra XXX Edition up to blistering speeds with a 675MHz core, a 1.67GHz shader unit, and 1.15GHz memory clock speeds.

But that awesome speed comes at a cost: Until now, we've been pleased with the relative quiet at which Nvidia's GPUs run. The Ultra changes all that—the fan on a single XFX card is loud enough to wake the dead. Put two of them inside a box and you can stir an entire cemetery.

We rarely complain about a component's price if it delivers impressive performance, but we have to draw the line somewhere. The Ultra is spectacular, but then, so is the GTX. And while the average GTX cost about $585 at press time, the price for this particular Ultra hovered around $875. Can you say "diminishing returns"?

—MICHAEL BROWN

XFX 8800 ULTRA XXX **8**

$875, www.xfxforce.com

BENCHMARKS

	ASUS 8800 GTX (STOCK CLOCKS)	SINGLE XFX 8800 ULTRA	XFX 8800 ULTRA SLI
3DMARK06 GAME 1 (FPS)	25.8	**33.1**	58.0
3DMARK06 GAME 2 (FPS)	23.7	**30.2**	52.4
QUAKE 4 (FPS)	92.1	**112.4**	164
FEAR (FPS)	69	**95**	145
SUPREME COMMANDER (FPS)	24.7	**32.4**	38.6

Best single-card performance scores are bolded. 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.

Flip Video 1GB

Shooting casual video doesn't get any easier than this

It seems that most people would want to use a high-def video recorder to document their growing families or Star Wars action-figure collections, but can a case be made for purchasing a low-res camera? At 640x480, the Flip Video's resolution isn't VideoCD low, but you won't stun your family when you proudly display your movies on a 60-inch, 1080p set.

Of course, this camera isn't for a Blu-ray or HD DVD audience—it's for the YouTube generation, which thinks that a horribly pixelated, low-resolution video is just dandy. Featuring 1GB of internal flash memory, which is good for one hour of video (a 512MB version is also available), the AA-powered Flip Video is about as simple to operate as a tape recorder. White balance? Fuhgetaboutit. You get record, play, and a mediocre digital zoom.

To get your video to your PC, you swing out the built-in USB connector and jack in to your rig. You can directly copy the videos to your PC, or if you really want the newb experience, you can fire up the app that's stored on the unit, a simple web-based interface that lets you view, edit, or share your videos. You can upload directly to YouTube or Grouper.com from the device and send an email notification to your friends and family that you have posted a new video. One caveat—doing so appends a commercial for the Flip Video to the end of your clip. Hey, if they're going to do that, shouldn't they be paying us?

Normally, we'd hold our noses at a low-res device that looks like something you'd find at the bottom of a box of Cap'n Crunch, but even the video snob in us found it hard to hate the Flip Video. And at $150, you won't think twice about using it as you're thundering down Splash Mountain.

This camera is so easy to operate a Mac user could handle it.

Our only problem with the Flip Video is that newer point-and-shoot digital cameras offer competitive video resolutions as well as superior still imaging. However, those still cameras cost at least twice as much as the Flip Video and aren't as easy to use.

—GORDON MAH UNG

FLIP VIDEO 1GB **8**

$150, www.theflip.com

OWC Mercury On-the-Go External Drive

If only there were a way to make this external hard drive go a bit faster

There are three schools of thought concerning external storage solutions: build an oversized bookend that rocks out with huge amounts of storage, sculpt a supremely portable device that you'd actually want to carry around, or just make a plain-vanilla enclosure. OWC's Mercury On-the-Go drive is a surprise contender in the second category, as it's a delightful combination of portability and speed.

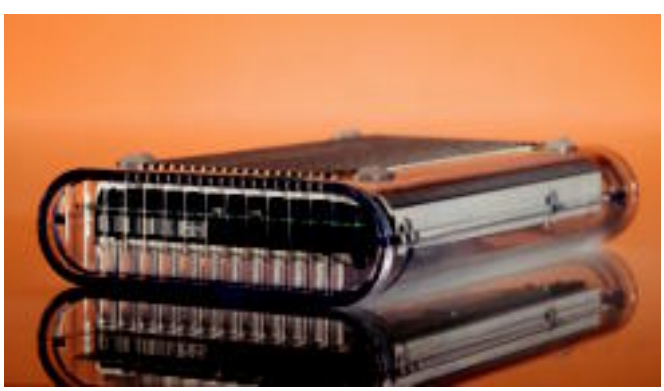
OWC has a number of models available; the one we tested features USB and FireWire connections, with an included Seagate Momentus 7200.2 SATA drive as the main source of storage. Firing up our tried-and-true HD Tach tests, we were pleased to see the device performing admirably on both its USB and FireWire 400 connections.

In essence, the Seagate drive fills the pipe. Connecting the clear external device via USB supplied us with an average read speed of 35.7MB/s, which is very near the maximum real-world throughput for USB 2.0. We saw a small boost in speeds when using the FireWire 400 connection, but the mere increase of 5MB/s for the average read speed is nothing to write home about.

BENCHMARKS

	ON-THE-GO USB 2.0	ON-THE-GO FIREWIRE 400
HD TACH RANDOM ACCESS (MS)	15	14.2
HD TACH AVERAGE READ (MB/S)	35.7	40
HD TACH BURST SPEED (MB/S)	38	43.1

Our current desktop test bed is a Windows XP SP2 machine using a dual-core 2.6GHz Athlon 64 FX-60, 1GB of OCZ DDR400 RAM on an Asus A8N32-SLI motherboard, a EVGA GeForce 7950GT videocard, a Western Digital 4000KD hard drive, and an Enermax Galaxy 1000W PSU.



You can definitely fit this drive in the back pocket of your jeans; now that's real-world testing.

That said, our biggest complaint with this particular model is that there's really no way to maximize the 7,200RPM drive's capabilities. Sure, you can connect to the enclosure via FireWire 800, but who has a FireWire 800 connector on their PC? We don't even have one in the Lab. An eSATA connection should be a staple for all enclosures like this; why bother with FireWire 800?

The drive is geared for people on the go, which we're assuming means "people of the laptop variety." Still, we were a bit taken aback by the short length of the included transfer cords. Details are important, OWC; the Mercury On-the-Go is great, but a little tweaking would a Kick Ass make.

—DAVE MURPHY

OWC MERCURY ON-THE-GO DRIVE **8**

$280, www.otherworldcomputing.com

Shure SE530PTH Earphones

There's a thin line between awesome and audacious

We dig innovation, and Shure's Push to Hear module is one of the best we've seen in personal audio.

For the price of one set of Shure's SE530PTH earphones, you could buy two 30GB iPods, 17 sets of Apple earbuds, or 500 encrypted songs from iTunes. A worthy investment or Marie Antoinette–style consumption?

With that question in mind, we couldn't resist auditioning these pricey phones to the sound of Cake's *Fashion Nugget*, ripped and FLAC-encoded, on Cowon's D2 digital media player. We don't know if Shure's BOM (bill of materials) justifies a $500 price tag, but we did have awfully big smiles on our faces after using these earphones.

The SE530PTHs fit snugly in your ears and prevent outside noise from reaching your eardrums, just as Shure's other in-ear phones do. In the past, there's been a downside to this setup: When you *need* to hear outside noise—such as when your roommate is desperately trying to tell you the house is on fire—you've had to pull the buds out of your head. So Shure came with a brilliant solution called Push to Hear (PTH).

Push to Hear is a slightly bulky module that fits in-line between the earphones and your MP3 player. Activating PTH turns on a directional microphone and cuts the player's volume. A green LED assures whoever is speaking that yes, you really are listening. PTH is a terrific, albeit expensive, solution to a common problem.

The earphones themselves feature three sets of microdrivers in each earpiece: a tweeter and *two* woofers. These bass twins deliver a heaping helping of low end—not as much as M-Audio's IE-20XBs (reviewed in the March 2007 issue), but it's much better defined in the Shures. They deliver faboo sound at the other end of the spectrum, too. The vibraslap opening on Cake's title track sounded like it was drilling deep into the left side of our brain—and we mean that in a good way.

Every link in the audio chain is crucial to delivering a great audio experience, but we draw a (dotted) line at spending twice as much on your earphones as you do your MP3 player. So, no Kick Ass for you, Shure.

—MICHAEL BROWN

SHURE SE530PTH **9**

$500, www.shure.com

Intermatic Home Settings Lighting Control Starter Kit

Home automation in baby steps

Additional lamp modules sell for $40 each. Don't like the wall-wart look? Replace your in-wall switch with a Z-Wave dimmer (priced about the same).

If you're considering automating your home, lighting is the best place to start. But if you're afraid that handling bare electrical wires will leave you with an Einsteinian hairdo, pick up Intermatic's Home Settings Starter Kit.

The kit, based on Z-Wave radio-frequency technology, consists of one HA07 remote control and two HA03 plug-in lamp modules. Plug the module into an outlet, plug your lamp into the module, program the remote, and you can now turn on the light from nearly anywhere in your house. No need to change out the existing outlets or switches in your home; no need to deal with bare wires.

Push the button on either the remote or the module itself, and the lamp will turn on or off (depending on its current state). Push and hold down the button and the module will behave as a dimmer switch, reducing or increasing the lamp's brightness.

Since this is Z-Wave technology, the remote is always aware of what state the module is in. If you turn the lamp on or off at the module, pressing the button on the remote will have the opposite effect; i.e., it will turn the lamp on if it's off and off it's on. Z-Wave operates on a mesh network, so if one module is out of range of the remote, any remotes that *are* within range will relay the commands until they reach their intended target.

Although the remote has only 12 channels, limiting you to 12 individually controlled devices, you can create up to 12 groups with up to 16 devices each for a total of 192 items. The remote features an astronomic clock that will automatically turn controlled lights on at sunrise and off at sunset, taking daylight savings time into account. You can also create 28 other timed events.

To control devices from your PC, add Intermatic's HA23 ThinkEssentials package ($50) or a similar application from another manufacturer—all Z-Wave products are interoperable. Lighting is just the beginning. Catch the bug and you'll want this technology throughout your home.

—MICHAEL BROWN

INTERMATIC STARTER KIT **9**

$115, www.intermatic.com

Test Drive Unlimited

Massive. Multiplayer. A whole lotta fun

Test Drive delivers straight-up racing on the island of Oahu against real players. We like that a lot.

Eschewing the gimmicks other driving games use to spice up their action (underground racing in Need for Speed and limitless destruction in Burnout), Test Drive Unlimited instead delivers a massively multiplayer real-world driving experience.

Test Drive is set on Oahu, where you'll race through a series of single- and multiplayer challenges to earn cash, which you can use to purchase new cars and houses. You'll start with a modest bachelor pad, a two-car garage, and an inexpensive roadster. Your first order of business is to complete a few challenges to earn money for a faster car. Challenges range from straight-shot drag races to technically challenging drift races to GTA-style pick-someone-up-and-take-them-someplace tasks. Although the game includes an excellent GPS-style nav system (complete with voice directions and onscreen driving directions), you'll need to become familiar with the island in order to win the higher-level challenges—simply driving a fast car isn't enough.

Test Drive's seamless multiplayer world sets the game apart from the competition. While you're driving around Oahu, you'll encounter other people on the road. You can compete against them in any of the game's challenges and even place side bets with other players on the outcome of the race. This feature is the game's biggest strength—and its biggest weakness.

You see, there are dozens of challenges, but most of them are multiplayer-only. Because many of the races require a certain class of car, the pool of potential competitors is limited even further. When you're starting out, before you've made enough money to purchase the best cars in each class, it's tough to find multiplayer opponents that aren't significantly better than you—because they either have a superior automobile or are more skilled. There just aren't enough single-player challenges. This makes the initial learning curve much more difficult than it should be for a massively multiplayer game.

However, if you stick with it, the game is very rewarding. There's an almost limitless number of cars to purchase, ranging from common vehicles like the Audi Quattro and Saturn Vue to superexotics and classics, think Ferrari and Lamborghini, and there are even motorcycles! While we wouldn't describe Test Drive as a true sim, the cars are all well modeled and deliver a satisfying driving experience. Crash aficionados beware, there aren't any realistic damage models or crunches in this game. For all intents and purposes, the licensed cars are indestructible.

For a slightly different tack on the typical arcadey racer, you can't go wrong with Test Drive Unlimited.

—WILL SMITH

Getting around on a massive island can be tricky; luckily, Test Drive comes with its own GPS nav system, which will get you where you need to go.

TEST DRIVE UNLIMITED

+ FERRARI ENZO
Realistic racing in a real-world environment against real players? Awesome!

– HONDA CIVIC
There's a steep learning curve for new players; building a stable of fast cars can be tough.

9

$40, www.testdriveunlimited.com, ESRB: E 10+

GAMING HARDWARE

MICROSOFT XBOX 360 RACING WHEEL

With an Xbox 360 wireless receiver, you can turn any 360 peripheral into a PC controller. We're big fans of the wireless gamepad—it works flawlessly and is virtually indistinguishable from a wired pad. However, the 360 racing wheel leaves a lot to be desired.

The basic functionality is there, but the big problem is a lack of force-feedback support in Windows (force feedback is present when playing a compatible game on the 360). Microsoft has promised to add FF support, but it's not available yet.

The actual wheel is very comfortable and easy to use. It comes with hardware that allows you to rest it on your lap or mount it to your desk, and we really like the inclusion of a complete digital pad and buttons on the wheel itself.

There are definitely better wheels available for the PC—the Logitech G25 kicks serious ass, delivers force-feedback support, and even includes an H-shifter and clutch pedals for about $100 more than this wheel. However, if you also play racing games on your 360, this might be a compelling option. **—WS**

Microsoft's 360 wheel works with both the Xbox and the PC.

XBOX RACING WHEEL

7

$130, www.microsoft.com

Win Rig of the Month AND WIN BIG!

IF YOUR MODDED PC IS CHOSEN AS A RIG OF THE MONTH, IT WILL:

1. **Be featured before all the world in *Maximum PC***
2. **Win you a $500 gift certificate for Buy.com**

SO WHAT'S STOPPING YOU?

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 April 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...

Stealing from NBC ✓Linux Love & Hate ✓30-inch LCDs ✓Awesome Upgrades

IN DEFENSE OF 30-INCH LCDS

From reading several articles in your magazine, it seems apparent that one of your editors has a bias against 30-inch LCD screens. Many people buy the 30-inch Dell monitor (the Dell Ultrasharp 3007WFP-HC, reviewed May 2007) for PC use and gaming, and for that it makes an excellent, high-quality display. It seems unfair to take issue with it not being HDCP compliant and not having onscreen controls or a resolution scale, since HDCP is plagued by first-generation problems on the PC anyway and the lack of onscreen controls can be solved by using display driver controls.

—Paul Jenigar

SENIOR EDITOR KATHERINE STEVENSON RESPONDS: It's nice you're satisfied with your Dell 3007WFP-HC, but we stand behind the 7 verdict for all the reasons stated in the article. For $1,700, we expect to get features that are available on smaller, less-expensive screens, and we anticipate that those features will be available in future generations of the LCD. The verdict reflects our belief that this product can be improved.

LINUX YAY AND NAY

*I have been using Windows all my life and had never considered switching to another operating system. After seeing some articles in **Maximum PC** about Linux, I figured, what the hell? Within minutes I had the machine up and running. It took a few days to get used to the different user interface, but it was well worth the investment. I am now exclusively using Linux! Please continue to write about Linux, it is really great.*

—Jim Sproch

*I have stopped subscribing to computer magazines because they are just off the mark. The exception to this statement has been **Maximum PC**. However, this month's issue is an absolute train wreck!*

Linux? Don't those people have their own magazine? Isn't their market share nonexistent (relative to Windows's)? What's next, you guys gonna start recommending Macs? If you want to talk about Linux, you should work for a different rag.

*Don't f*** up a good magazine.*

—Kimo Akane

EDITOR IN CHIEF WILL SMITH RESPONDS: There was certainly a ton of feedback on the June issue's Linux story. It's the most space we've ever devoted to the OS, and the response was polarizing. To address your points specifically, Kimo, while "those people" do have magazines,

Is Downloading TV Shows Theft?

I have an Xbox Media Center, and I download TV shows from BitTorrent onto it, so I can watch them whenever I want. Recently, my ISP turned off my Internet because NBC complained that I was downloading episodes of its copyrighted shows. I find this strange for a couple of reasons.

Networks such as NBC broadcast shows free over the air to anyone who wants to watch them. Secondly, they offer them for free on their websites. So if they offer two ways for me to get shows for free, what is wrong with downloading a free AVI that someone encoded from an over-the-air antenna? This isn't like copying a CD or DVD—the episodes are free in the first place, so it is not like I am downloading something that I should have paid for.

Also, I used to save the shows from my high-def antenna with a capture card, but I download them instead because other people make better, higher-quality videos than I can, and it saves me the hassle. I know it's not illegal for me to capture them myself, so what is wrong with getting the file from someone who does a better job capturing the free broadcast? Can you guys shed some light on this for me? Please explain what I'm doing wrong!

—Justin Watts

EDITOR IN CHIEF WILL SMITH RESPONDS: Here's the scoop, Justin. That NBC broadcasts its shows over the public airwaves and streams them across the Internet for free is irrelevant. NBC owns the content it pays for and creates and can control the way it's distributed. When the company broadcasts content over the air or at NBC.com, it also displays advertisements and then measures the number of people who watch the shows on both formats and charges advertisers for displaying their ads. The nearest analog to your illegally downloaded TV shows are the iTunes Store downloads, which are ad-free and come at DVD resolution for a couple of bucks per show.

The fact is, NBC owns those shows and can choose to distribute them, or not distribute them, however it wants. That means if NBC sends you cease and desists when you download from BitTorrent, you shouldn't download from BitTorrent. It's also worth mentioning that NBC probably wasn't objecting to you downloading the shows as much as it was upset that you were redistributing them (albeit unintentionally) to other people using BitTorrent.

there aren't really any Linux mags in the United States that serve typical consumers who want to make the switch. The Linux mags I've read are geared toward IT folks.

As for market share, while the overall Linux market is relatively small, it's much greater at the enthusiast end of the spectrum. According to our web stats, about the same number of our users are on Linux as are on Vista (combined it's around 16 percent of our overall audience). While that's small, it's enough people to make it worth covering both of those OSes.

That said, there's no danger of us turning *Maximum PC* into a dedicated Linux mag. While we'll continue to do occasional stories as they're warranted, we won't have Linux coverage in every issue.

UPPITY ABOUT UPGRADES

The sum total of your awesome upgrades (June 2007) comes to more than $3,600. Awesome? I damn well hope so!

—Martin Smith

SENIOR EDITOR KATHERINE STEVENSON RESPONDS: Yes, those upgrades are awesome. And what's especially nice is that you can pick and choose any of the upgrades you wish to implement—nothing requires you to buy into all of these upgrades at once, nor would you even want to (a budget CPU and a power-efficient CPU in one box? That just doesn't make sense).

ANOTHER REASON EMAILING DAVE IS BETTER THAN CHECKING GOOGLE

When I was reading your review of the Thermalmake 7-inch Touch Screen LCD Monitor in the July 2007 issue, it left me feeling the exact opposite of appalled, but the fact that you guys didn't include which cases Thermalmake makes that have 7-inch drive bays is appalling. I would feel a lot better if you guys included some of them in the response to this email. Thanks.

—Billy Hanifin

ASSOCIATE EDITOR DAVE "THE MURPH" MURPHY RESPONDS: The two cases that you can currently stuff the 7-inch Touch Screen LCD Monitor into are Thermaltake's Mozart TX and LanBox cases. If the device worked with standard-size expansion bays, it would have received a higher score.

DOWN WITH CELL-PHONE COVERAGE

In the July issue, you have eight pages of cell phone reviews and five pages devoted to an HDR photography how-to. Next month can we expect "How to Install GPS in Your Saturn Sky"?

*If I want to subscribe to a consumer electronics magazine, a digital photography magazine, or an automotive magazine, I shall do so, but please keep it out of **Maximum PC**!*

—Howard Barker

EDITOR IN CHIEF WILL SMITH RESPONDS: Every once in a while, we'll run a story that's outside our comfort zone, like the smartphone roundup, the HDR photography how-to, or a using Linux story. As a magazine, it's imperative that we explore new product categories constantly. When we begin covering new categories, we think it's vital to start with a good overview of the market because it's impossible to accurately review products in a vacuum. While we won't be doing regular 10-page smartphone stories, we will cover them occasionally.

FOUL ON THE FALCON

I read the review of the Falcon Northwest Mach V in the June issue—a $9,900 computer that didn't even post when you received it, and you gave it a 9? It was unstable running four instances of Prime95 and you gave it a 9? I'm disappointed that this system got such a high score when the delivery and the overclocking stability is in serious question. The day I spend $9,900 for a system that reboots when heavily loaded, please have my head examined.

—Chris Blockston

SENIOR EDITOR GORDON MAH UNG RESPONDS: We can't hold a vendor responsible for shipping problems if the system is properly packaged. The SATA cables were glued in place, but the box had taken such a beating in shipping that one cable had broken loose. On a recent machine that was double-boxed, the graphics cards and soundcard had to be reseated after it arrived. Our verdict was based on the performance of the machine, which at the time, smoked everything we had seen before. The script we use loads different instances of Prime95 that put more stress on the chips. 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 email we receive, we cannot personally respond to each letter.

COMING NEXT MONTH

IN MAXIMUMPC'S SUNSHINE, LOLLIPOPS & RAINBOWS SEPTEMBER ISSUE

DREAM MACHINE XII

Another year, another *MPC*-built rig that kicks ass, takes names, and then makes taunting rhymes out of those names! Find out which of today's hottest parts end up in our big, bad bully of a machine!

ROCK A WIKI

Don't know what a wiki is or why you'd want one? Lifehacker.com founder Gina Trapani will give you the deets as she walks you through the steps of creating your own personal online database.

AUDIO QUALITY CHALLENGE

Is there a perceptible difference between a 256Kb/s music track and a 128Kb/s track? How 'bout between a $30 pair of earphones and a pair costing $400? Ten test subjects will help us answer these pressing questions.

Sponsored by Buy.com

DON SOULES'S

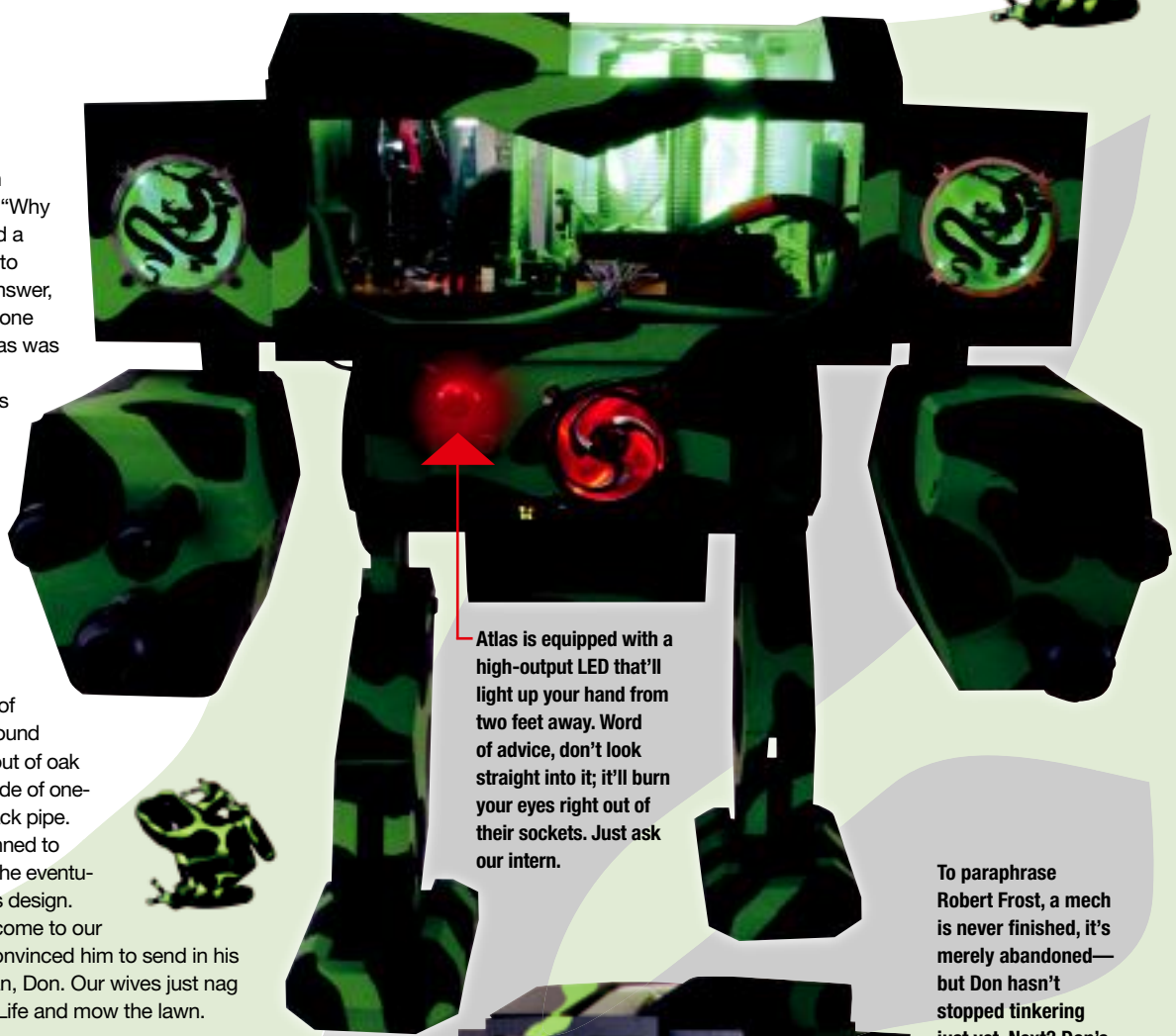
Atlas

One afternoon, Don Soules wondered, "Why hasn't anybody modded a mech?" Not being able to come up with a good answer, he went about creating one himself. A year later, Atlas was complete.

Don modeled Atlas's design on that of a species of African dart frog; the goal was to create something that used camo patterns with bright, I'm-deadly-enough-not-to-care-if-you-spot-me colors. It's safe to say that Don nailed that look.

The poseable body of this three-foot-tall, 60-pound behemoth was crafted out of oak veneer; the guns are made of one-foot-long sections of black pipe. While Don originally planned to include a rotating torso, he eventually had to reevaluate his design.

And how did Atlas come to our attention? Don's wife convinced him to send in his entry. You're a lucky man, Don. Our wives just nag us to stop playing Half-Life and mow the lawn.



Atlas is equipped with a high-output LED that'll light up your hand from two feet away. Word of advice, don't look straight into it; it'll burn your eyes right out of their sockets. Just ask our intern.

Don designed Atlas so that getting parts in and out of it would be easy. The power supply is on aluminum rails, the mobo also slides out, and the front lexan and hood are removable to ensure easy access to all the components. We know a few casemakers who could take lessons from Atlas!

To paraphrase Robert Frost, a mech is never finished, it's merely abandoned—but Don hasn't stopped tinkering just yet. Next? Don's considering adding revolving chainguns made of aluminum conduit.

For his winning entry, Don Soules wins a $500 gift certificate for Buy.com to fund his modding madness! See all the hardware deals at www.buy.com, and turn to page 100 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.

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