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MARCH

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So Long, and Thanks for All the Pie

After 119 monthly issues and roughly nine and a half years (3,474 days, according to Wolfram Alpha), this is my last issue as Editor-in-Chief of *Maximum PC*. I'd like to pretend it's been grueling work—from the crazy costumes to our intern-torturing escapades to the great smoke alarm incident of 2000—but, I can assure you, it's been a blast.

Most importantly, I've enjoyed working for you guys over the last decade—a decade that's been chock-full of amazing technological triumphs, as we accelerate ever faster toward the Singularity. To give a little perspective to that decade, here are the four achievements (presented in no particular order) that I think have made the biggest impact on the world, during the time I've been at *Maximum PC*.

▶ **The Internet Grows Up.** When I started at Maximum PC, fast Internet access was 1.5Mb/s. I get that on my phone now. When I started, most people had heard of the Internet, but no one used it… and wireless service? Nonexistent. Now, my dad's on Facebook and my mom is an eBay power user. This has, naturally, had some consequences.

▶ **Processors Get Incredibly Powerful.** We're all familiar with Moore's Law, and the last 10 years have shown truly astounding improvements in computational power. When I started, CPUs could barely decode standard-definition MPEG-2 video. Today, we can encode multiple MPEG-4 streams on the fly—a feat that would have been magic in 2000.

▶ **Storage Gets Massive and Cheap.** In 2000, state-of-the-art storage came in the form of the 75GB hard drive. Today, for about the same money as an IBM 75GXP, I can buy a 2,000GB hard drive. The advances we've seen in both storage capacity and speed have powered everything from YouTube to Gmail to Dropbox. SSDs are only going to push that further.

▶ **LCD Panels Got Cheap, Massive, and Plentiful.** In 2000, a 19-inch CRT was a massive, extravagant monitor, and a flat panel was a tiny luxury. Today, LCD flat panels are ubiquitous and scale from the pocket-size displays found on phones to massive 70-inch monsters that power HDTVs.

Individually, these advances were exciting. Taken together, they've pushed multiple revolutions that affect us as. I'm talking about the smartphone revolution, the rise of the social web, and the advent of Internet audio and video streaming. If you showed me Facebook, an iPhone, and YouTube in 2000, and then told me they all worked together using a speedy wireless Internet connection, I'd probably have had you committed. Yet here we are.

So it's with eyes wide-open and an optimistic smile on my face that I look forward to the next decade, and I hope to hear from you there. As always, if you want to continue our conversation, you can follow me on Twitter at http://twitter.com/willsmith, or in my weekly column at MaximumPC.com.

Before I sign off, I want to thank the entire *Maximum PC* team—Jon, Gordon, Katherine, Natalie, Nathan, Norm, Alex, Boni, Mary, and all the other folks who've worked here over the years—for making this the best, nuttiest, most awesome place I'll ever work. Of course, thanks are also due to you, the loyal readers, for bringing *Maximum PC* into your homes each month. I've loved every minute of it.

Will Smith

BRINGING THE LOVE

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THE NEWS

Discrete Fail: Why Do so Few PCs Feature Graphics Cards?

Despite all the hype over the GPU's prowess, the inventory of retail PCs show consumers aren't buying it —GORDON MAH UNG

The GPU might be hailed as the new heir to the computing throne, but a stroll through any big-box PC retailer doesn't bear that out—very few PCs under $900 even have discrete graphics cards. Instead, in the vast majority of machines for sale, the lowly, spat-upon integrated graphics rule the roost.

According to John Karabian, a product manager with No. 2 PC maker Acer, for the average consumer, it's still just about the big three: CPU, RAM, and hard drive: "They know a 3.2GHz Core i7 is going to be slower than a 3.33GHz Core i7, 4GB is better than 2GB, and 1TB is better than 500GB." The graphics card, Karabian said, is just something most consumers don't think about, and if they do, it's in a negative way. "The perception, it seems, in the marketplace, is that discrete graphics are only for gamers," said Karabian.

Randy Copeland, president of Velocity Micro, agreed that the average consumer couldn't care less about graphics in today's market. Although Velocity Micro's PCs are above the mainstream $900 PC, and all include graphics cards, he said it is difficult to market the benefits of the GPU to consumers.

"They don't get the value of that graphics card unless there is a blue shirt there walking them through it," Copeland said. "You don't have a whole lot of space to sell someone a computer. It's limited to the four or five bullet points [on the price tag], and that's your sales pitch."

Now, try to educate someone on the differences in the number of texture and stream processors in a GPU, and the memory bandwidth of a videocard.

Karabian agreed, saying the abbreviated life cycle of graphics cards makes it even more confusing.

"You really have to delve deep to find out why a Radeon HD 4870 is not as fast as a Radeon HD 5870 or a GeForce GTX 285. That's a challenging prospect, and then you're back to, 'Oh, it's only for gamers,' " according to Karabian.

Analyst Jon Peddie of Jon Peddie Research, said the situation is unfortunate because PCs, and especially graphics, offer particularly good value for the money.

"If a retailer can sell the benefits of more memory and clock speed of the CPU, then he/she can certainly sell the benefits of better graphics. However, it's been pretty well established that higher CPU clocks don't deliver as much bang for the buck as a more powerful GPU for anything that involves pixels. And, sadly, the applications aren't making much use of the multicore CPUs being shipped today," he said.

GRAPHICS WILL ONLY BECOME A HARDER SELL AS INTEL AND AMD RELEASE CPUS WITH INTEGRATED GRAPHICS CORES

Peddie said discrete graphics will only become a harder sell as Intel and AMD release their respective lines of CPUs with integrated graphics cores. These chips have enough graphics power to capture all of the midrange PCs, as well as to eat into the low-end $100 GPU market. Integrated graphics accounted for 72 percent of PC sales in 2009, according to Peddie. That's up from 68 percent just the year before.

"The problem is the consumer hasn't been properly educated about the benefits of discrete graphics," Peddie said. "Had Intel delivered Larrabee, it would have helped overcome that ignorance. But today, all the average consumer seems to know about discrete graphics is that they're good for games. GPU compute for color correction, transcoding, video smoothing, and encryption isn't being explained to the consumer the way I think it should be, so purchase decisions are made on price and not features."

Sub-$1,000 PCs, like this HP Pavillion, rarely feature discrete graphics.

Nexus One and the Rise of Android

In January, Google launched the Nexus One, a "superphone" with a 1GHz Snapdragon processor and 800x480 AMOLED screen, running the Android 2.1 operating system on HTC-developed hardware. Unlike the similarly configured Motorola Droid, the Nexus One is billed as a "Google Phone," and—more significantly—is being sold by Google via a web store, not by individual carriers. The GSM version of the Nexus One is sold either unlocked or with a two-year T-Mobile contract, and a CDMA version on Verizon is forthcoming.

Also in January, AT&T Wireless announced five forthcoming Android phones, including one by Dell. With more than a dozen phones, a robust (and open) app store, and now a presence on every major wireless carrier in the United States, Android is on track for a very good 2010. **—NE**

The Nexus One isn't a revolutionary phone, but its Android operating system is building steam.

FTC Sues Intel

If you're Intel, when it rains, it monsoons. The Federal Trade Commission has filed suit against the chip giant, claiming that its sales practices not only unfairly hurt AMD, but also Nvidia.

The suit alleges that Intel rigged benchmarks to favor its chips, changed its compilers to make AMD's chips run slower, as well as muscled or paid off vendors to use Intel chips exclusively. Intel says the suit is misguided and based on groundless accusations. Intel also says consumers have benefited over the years by getting faster CPUs—and for lower prices.

The FTC suit comes on the heels of a massive $1.45 billion fine by the European Union antitrust body, as well as a $1.25 billion settlement with AMD and an additional antitrust suit by the New York State Attorney General. **—GU**

Core i7 Conquers Supercomputer at Pi

There's a guilty pleasure in seeing the "masters of the universe" knocked down a notch or two. So, news that the record for calculating Pi, set by the T2K Open Supercomputer, was not just broken but smashed by a lowly Core i7 machine was warmly received.

The feat was performed by Fabrice Bellard. He pieced together a system using a Core i7 CPU running at 2.93GHz, 6GB of RAM, five 1.5TB Seagate Barracudas in RAID 0, and the 64-bit version of Red Hat Fedora 10. He then started up a Pi algorithm based on the Chudnovsky formula and let it rip. After 103 days, he had Pi calculated out to 2.7 trillion decimal digits, blowing by the old record of 2.5 trillion decimal digits. The number required 1,137GB of storage space. **—BS**

Gasping for Air

Last month, I talked about the growing need for radio-frequency (RF) spectrum to support Internet services on smartphones and other mobile computing devices. Some experts say we'll need 700–800MHz of additional spectrum—none of which is available now.

We can't manufacture RF spectrum. It's a finite resource, and only some of it has the range and penetration required to blanket a region. Data compression conserves spectrum, but there's a mathematical limit (Shannon's law) that prevents further compression without losing data integrity. Today's communications standards already approach the limit.

The telecommunications industry wants to grab more spectrum from TV broadcasters, who surrendered a big chunk of airspace in the recent transition from analog to digital TV. The telecoms want UHF channels 40 to 51, or even 20 to 51. Some people want to end terrestrial TV broadcasting altogether—which would still free less than half the spectrum we supposedly need.

Another solution is to use the "white space" between TV channels. White space is unused spectrum that keeps TV signals from interfering with each other. Unfortunately, recent experiments suggest it doesn't work well in urban areas, the very places where demand for wireless Internet coverage is highest. And it won't provide nearly enough spectrum when everyone has a smartphone.

Yet another proposal is to replace today's powerful, regional TV broadcasting with lots of weaker signals. Their reduced range would allow different TV stations to use the same channels in the same region. But this proposal has technical problems and would free only 100–180MHz.

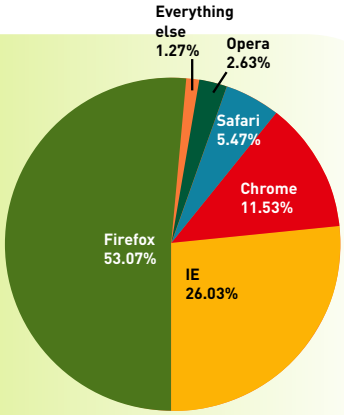
What's left? Femtocells. A femtocell is a tiny cellular network, usually confined to a home or office. It's like cellular Wi-Fi. Cellular traffic hops a short distance to the nearest femtocell router, which connects to the Internet over a landline. We can always lay more landline wire, cable, and fiber.

To make this solution universal, femtocells should allow public access, which means they must be secure. Also, millions of femtocell routers must be installed in homes and businesses, which will probably bear the cost of this infrastructure. Despite the drawbacks, femtocells seem the best way to keep us from running out of air.

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

Chrome Rising

The Chrome browser has made impressive gains in market share in the short time it's been around. Since Google released the browser in December 2008, Chrome has grabbed the third-place spot in worldwide use at 4.63 percent, behind IE (62.69 percent) and Firefox (24.63 percent). Chrome's growing popularity is even more pronounced at MaximumPC.com, where its use more than doubled in the last year (from 5.03 percent). **–KS**



Breakdown of visitors to MaximumPC.com in December 2009.

MS Changes Bing Privacy Tools

Takes a shot at Google in the process

Sensing a possible opening against search giant Google, Microsoft has made changes to Bing's privacy tools.

The move comes after Google changed its own search-engine privacy policy. One such change is increasing the amount of time Google stores search history in a browser cookie to 180-days, so the company has a database with which to second-guess what you want to look for. That, along with CEO Eric Schmidt's recent comments to CNBC that users shouldn't expect privacy, prompted Mozilla's Director of Community Development Asa Dotzler to say users should drop Google in favor of Bing.

Hot on the heels of the controversy, Bing is touting both its privacy and changes that enhance that privacy. Bing will now give you greater control over the history of your recent searches with "See all," "Clear all," and "Turn Off" options on the home page. Microsoft will store a maximum of four weeks of searches in a browser cookie.

In the announcement of these changes, Microsoft said, "...we've tried to build privacy and respect for your search history into the overall experience and not as an afterthought. Too many systems provide us with choice, but little control."

Take that, Google! **–BS**

AT&T TOPS SPEED TEST

The carrier's service may be flaky, but it's fast

Even a cursory glance at the Internet will reveal that people hate AT&T. While a great many people love their iPhones, the network is their one major complaint. But Gizmodo.com's recent 3G speed test throws AT&T a bone. If you have solid AT&T 3G service, it's probably really, really fast.

Gizmodo tested 3G data speeds in 12 markets around the United States. The tests checked raw speed using Speedtest.net, as well as performance downloading very large images and web pages. The results of the testing indicate that AT&T beats out Verizon in average download speed. However, it was close, with Verizon winning in four of the 12 markets. The real shocker is that AT&T absolutely destroyed the competition in upload speeds, winning all 12 markets. Sure, AT&T has some issues with coverage, but the network is fast where you can get it. **–RW**

GAME THEORY

History Alive

It's wonderful that even after 30-odd years as a gamer, there are still gaming moments that can surprise and delight me. Assassin's Creed II (finally available for PC this month) absolutely knocked me cold within the first few minutes of the Florentine sequences.

It wasn't the gameplay. Although the movement and combat are certainly strong (and a clear improvement over the original), we should expect that. It's 2010: We've had so many quality exemplars of stealth and fighting systems that a developer has no excuse not to do it right.

It wasn't the premise, which is dumber than a contestant on *Conveyer Belt of Love*. All the memories of all my ancestors are encoded in my DNA? Really? Right there between eye color and height is a base pair of nucleotides recording my 24th great-granduncle's encounter with a hooker on January 24, 1472? And Veronica Mars is capable of extracting that memory and feeding it back into my brain as a simulation? *That's* your premise?

No, the real treasure of Assassin's Creed II, the real magic that takes the breath away, is Florence itself, and later, Venice. This is why I still game, and why the art of simulation is so utterly unique to gaming. Film and prose are, frankly, better media for narrative storytelling. "Gameplay" can be found in sports, puzzles, and conventional games.

But only interactive entertainment can truly simulate an environment, and then draw the narrative and gameplay elements into that simulation. The Florence and Venice of AC2 are masterpieces of design. It's not just the architecture and open-city design, but also the living environment down on the ground, as people go about their lives. Merchants sweep the street in front of their stores, courtesans beckon from corners, pickpockets work the crowd, and threaded throughout all of it is the tension, plotting, and power-politics of Renaissance Italy.

I spent a semester in college (and a great deal of time since) studying many of these places and the history surrounding them, and Ubisoft Montreal nails it. Viewing 15th century Florence from atop Brunelleschi's gravity-defying dome, and then being able to drop down to ground level to explore the city is one of the most thrilling things I've experienced in a lifetime of gaming. Thanks, Ubisoft.

Thomas L. McDonald has been covering games for 17 years. He is an editor at large for *Games* magazine.

Would You Like Wi-Fi with That?

In January, McDonald's began offering free Wi-Fi to its customers, doing away with the $2.95 fee it had been charging for two hours of wireless Internet access. It's the result of a new partnership between the restaurant chain and AT&T.

The company's decision to make the switch to free Wi-Fi comes as the chain tries to transform itself into a social hangout and not just a greasy burger joint. In addition to its wireless plans, McDonald's will also begin selling frappes and smoothies in most of its stores by mid-2010. —PL

Researchers Show off Bendable Flash

A research group from the University of Tokyo is showing off a flash memory module that can be flexed into an arc with a 6mm radius before suffering mechanical damage.

The module consists of 26x26 2T memory cells in an array structure placed on a polyethylene naphthalate (PEN) substrate. This "organic flash memory" is nonvolatile and has an erasing voltage of 6V and a reading voltage of 1V.

Researchers say the memory can be used for large-area sensors, electronic paper, or any device that requires its memory retention time extended. —BS

FLASHBACK

Return of the Polaroid OneStep

Amid all the new-fangled gadgetry presented at this year's Consumer Electronics Show, Polaroid played the nostalgia card, showing off the PIC 1000, a rejuvenated OneStep of yore. The camera, available through retailers this year, will use the same Polaroid Color 600 Instant Film of the older models. —KS

BYTE RIGHTS

Outing ACTA

ACTA, the Anti-Counterfeiting Trade Agreement, is a treaty on international IP enforcement being secretly negotiated between various nations and trade groups, because apparently the normally inscrutable WIPO (World Intellectual Property Organization) wasn't arcane and opaque enough. Documents related to things like copyright enforcement at borders (read: taking your iPod away) have been given classified status as a national security matter by executive order. Really? National security?

When did national security get this lame? ACTA is making me miss the Cold War. Back then, when governments and corporations did backroom dealing, covering up their sinister moves with callous disregard for their citizens' rights and well being, they were covering up doomsday nuclear stuff on sexy '60s microfiche. They also had the decency to protect their secrets from James Bond with sexy spies and ninjas.

Instead, our dweeby leaders gave classified documents to the BSA and RIAA types, further degrading the cool of classified documents. They leaked. Bearing in mind there is no final treaty yet, the documents currently describe a global DMCA, except worse, which probably would shut down services like YouTube, Flickr, and Scribd, by making companies responsible for any infringing user-uploaded content. They also describe draconian border procedures against people who listen to music, set up a total surveillance state online, and do away with the 4th Amendment.

Why the pathetic subterfuge? Partly it's a tactic called policy laundering, wherein no one can see who is responsible for what policy, and the parties can all claim to have compromised as hard as they could, they swear. The bad policy, you see, came from some other nation they can't tell you about, and now we just have to live with it. The ACTA folks are also probably hoping that by showing up with a completed treaty, they can bypass messy negotiations with the elected lawmakers in all those nations and their pesky populations, who are less inclined to go along with provisions that allow massive prosecutions, unprecedented surveillance, and hobbling of the net. It would be one thing if they were irradiating the world's gold supply, but all this in the name of stopping teens from using BitTorrent and poor nations from making cheap AIDS drugs? Weak.

Quinn Norton writes about copyright for Wired News and other publications. Her work has ranged from legal journalism to the inner life of pirate organizations.

THE LIST

Maximum PC's Best of CES

8 LENOVO U1

This CULV-powered laptop comes with an ARM 'n' Linux-based removable slate display. Rad!

7 PARROT'S AR DRONE (IT FLIES!)

TWONKYBEAM

6 Blast photos, video, and music from your web browser to DLNA-equipped TVs. Awesome.

SKIFF

5 No glass and an 11.5-inch display in this ebook reader? We wantee!

4 TEGRA 2

With a speedier ARM CPU and more-capable graphics, Tegra 2 looks promising for tablets. Oh, it also runs Unreal Engine 3.

3 ALIENWRE M11X

A four-pound notebook equipped with a real GPU? Yes!

2 BOXEE BOX

D-Link's new media-streaming wunderbox—featuring Boxee's awesome user interface—may render your HTPC superfluous.

1 LG Ultraslim LE9500 HDTV

This may be the perfect HDTV. It's thin, has virtually no bezel, and its LED backlight supports local dimming for pixel-perfect black reproduction.

This month the Doctor tackles...

- Laptop BIOS Password
- WHS Support
- RAID Controllers' Delayed Writes

Reset Laptop BIOS Password

I have an HP Pavilion zv5001us laptop that is about six years old. It has a Phoenix BIOS, if I remember correctly. Whenever I try to access the BIOS, the computer prompts me for a password. I forgot the password and don't know how to get around it. Thanks.

—Vincent Gonzalez

Yikes, Vincent. On a desktop PC, all you need to do to reset a BIOS password is clear the CMOS, either using the CMOS jumper or by removing the CMOS battery. But it's different on a laptop—some have accessible batteries and some don't. We searched the zv5001us repair manuals and HP's support site and couldn't find a way to reset the BIOS settings without going into the BIOS itself. You'll probably have to talk to HP directly. You can always try the default Phoenix BIOS password, which is "phoenix" (without the quotes), but there's no guarantee it will work.

What's Rundll Running?

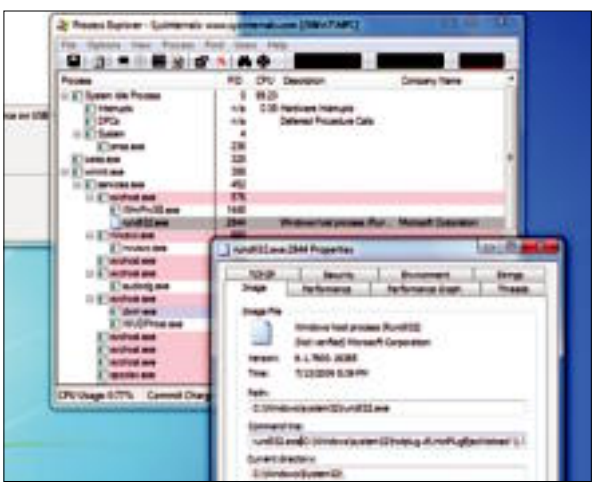
I have Windows 7 and when I start a game like the Homeworld 2 demo, my processor refuses to go below 50 percent usage. When I look in the Task Manager the process called rundll32.exe is using 50 percent of the CPU cycles. I ran an Avast scan; there is no indication of a virus. I can fix this by suspending the task and the games run fine without the rundll32 task going. Any idea of why this is going on?

—Ian

Ian, Homeworld 2 is an old game and is not optimized for multicore processors or Windows 7. Be sure you're running in compatibility mode (accessible by right-clicking the application icon and going to Properties, then the Compatibility tab).

Provided the rundll32.exe is located in the Windows\System32 directory, it's most likely legitimate. If rundll32 *isn't* located in Windows\System32, it could be malicious software masquerading as a legitimate process. Run Malwarebytes' Anti-Malware (www.malwarebytes.org) to flush it out.

Rundll32.exe is a generic application used to access the contents of Dynamic Link Libraries, or DLLs, which many Windows apps use. To find out which DLL your process is accessing (and therefore what the heck it's doing, and what you're pausing when you suspend the task), download Process Explorer from Microsoft (http://bit.ly/2QxebL) and run it. Look for the rundll32.exe entry, then right-click it and hit Properties. You'll see a field called Command Line, which will tell you which dynamic link library the program is calling—and thus whether it's important or not.



Process Explorer can help you figure out which dynamic link libraries runddl.exe is actually accessing.

Mystery Error at Line 544

I love my PC, but it has just gone wacko! I keep getting this error on Windows XP: "Parser message: Value creation failed at line 544."

I put my PC to sleep, but the message pops up repeatedly before it will sleep. Once it returns from sleep, the same message pops up five times, followed by the Classic startup screen. I don't use the classic theme, but I couldn't figure out what was going on so I just dismissed the error and kept playing the game I was playing. The next day the error was back. Help!

—Will English

This can happen if you're using a nonstandard visual style for Windows. Service Pack 3 broke a lot of custom visual-style switchers like Uxtheme Patcher and StyleXP. If you were using one of those, or if you've recently upgraded to XP SP3, switch back to the default Windows XP theme (right-click your desktop, select Properties, and in the Theme tab, pick "Windows XP" from the drop-down menu).

If that doesn't work, some other system file may have changed in a way that Windows doesn't understand. To find out, go to the Start menu, hit Run, and type src /scannow, then hit Enter. Windows will scan its protected files and if it finds any non-standard ones, will overwrite them, which will hopefully solve your problem if the first step doesn't.

Laptop Proc Upgrade?

I'm considering upgrading my laptop's CPU but don't know what to use as a replacement.

My laptop is a Dell Latitude D820 with an Intel Core2 T5500. This CPU does not support virtualization, so I am looking to replace it with a CPU that does. How do I go about figuring out which CPUs go with my laptop motherboard? If I am going to void my (very expensive) warranty doing this, I want to be sure that I have the correct part.

—Anne Richey

It may be the recession, but the Doctor has gotten more laptop CPU-upgrading questions in the past two months than ever before. Keep in mind that many laptop CPUs are soldered to the mainboard and aren't easily upgradeable; however, the Latitude D820 is upgradeable. It looks like the best CPU you can put in your laptop that will support virtualization is the Core 2 Duo T7600 Mobile. However, as is often the case with discontinued CPUs, you'll have to drop more than $300 to get one ($312 is the cheapest we've seen it, at Ewiz.com), at which point it's almost wiser to replace the whole laptop.

THE DOCTOR HAS GOTTEN MORE LAPTOP CPU-UPGRADING QUESTIONS IN THE PAST TWO MONTHS THAN EVER BEFORE

Just a Bunch of Disks

I have a small collection of PATA hard drives: 4.3GB, 15GB, 20GB, 40GB, and 160GB. All still function fine, even the 4.3GB, but I want to use them collectively for backup or as a server.

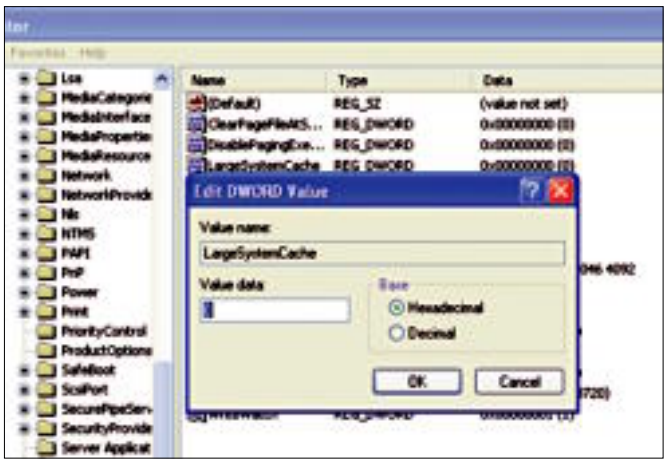
I use a 500GB hard drive in a single-drive Ximeta Network Direct Attached Storage device as my server (file access for all my networked PCs) and a second single 250GB NDAS for backup of three PCs (three equal partitions).

Do you have any solutions for these small drives? I'm not too familiar with RAID, if that's an option, but I'm willing to learn about it, or maybe something like FreeNAS. The only conditions are low cost, low noise, and minimal heat output, as whatever is chosen may end up in my bedroom.

—Cassandra M.

Although your drives still work, finding a way to connect five PATA and one SATA drive together in a RAID or NAS is going to be more expensive than the drives are worth. You can get a 250GB SATA drive (with more capacity than all your PATA drives put together) for much less than the price of enough adapter cards to run a five-PATA-disk JBOD array. (JBOD, or Just a Bunch of Disks, is for creating large virtual volumes from a jumble of mismatched disks like you're describing).

More to the point, an array of five or more hard drives, with the associated hardware, is not going to be low cost, low noise, or minimal heat. That's five hard drives drawing power, spinning up, and spinning down constantly. You'll be better off from a cost, noise, and heat perspective going with a single larger "green" drive like WD's Caviar Green or Seagate's Barracuda LP, in a one- or two-bay NAS box.



Delayed write errors can be the fault of the LargeSystemCache registry entry.

Delayed Write

I have a Gigabyte 8KNXP Rev 1 motherboards that gave up the ghost. It had a RAID 0 array of two Maxtor DiamondMax 10 drives on the Gigabyte board's onboard IT8212F RAID controller.

I replaced the dead motherboard with an EVGA nForce680i SLI board. Not wanting to risk the loss of 150GB of data from the last four years, I bought an IDE RAID controller card with the same IT8212F chipset and reinstalled XP SP2.

When I access the RAID drive, I can read the directories and even open the folders within. Yet, Windows XP will give me a balloon in the lower right-hand corner saying: "Windows – Delayed Write failed. Windows was unable to save all the data for the file G:\xxx. The data has been lost. This error may be caused by a failure of your computer hardware or network connection. Please try to save this file elsewhere."

How might I ensure that I can save my data from this drive without risking permanent data loss?

—Paul Andrew

Delayed write failures can happen in XP SP2 if your RAID drivers are out of date. Try downloading the driver version 1.7.2.9 from ITE's website (http://bit.ly/6tdyoG). You should also upgrade your XP install to SP3.

Delayed write errors can also happen if your LargeSystemCache registry setting has been set to 1. Enabling the LargeSystemCache was useful in ye olden days, but there's really no need to enable it in modern systems. Go to your Start menu, hit Run, and type regedit. Then navigate to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\SessionManager\MemoryManagement and check the LargeSystemCache entry. If it's been set to 1, change it back to 0.

WHS Hardware Support

I'm really hoping you can help me with a Windows Home Server build. I'm using an Asus A8N-SLI Premium motherboard with an AMD Athlon x2 4400+ CPU at 2.2GHz, 1GB Corsair RAM, a 500W Apevia PSU, and an EVGA 8800 GTS videocard, with a 500GB SATA drive.

I downloaded the Home Server Evaluation copy

SUBMIT YOUR QUESTION Are flames shooting out of the back of your rig? First, grab a fire extinguisher and douse the flames. Once the pyrotechnic display has fizzled, email the doctor at doctor@maximumpc.com for advice on how to solve your technological woes.

from Microsoft three different times and installed it three times, wiping the drive each time and starting from scratch. Each time it took more than 12 hours to install the OS, and when it finally did, the CPU was running maxed out and extremely laggy. Installing Nvidia's chipset drivers made no difference, either. Please help! I'm about to purchase a new mobo and CPU but I'm not sure if that's the problem.

—Gary

Windows Home Server is based on Windows Server 2003, which is pretty specific about the chipsets it supports. The big problem is that there are no Windows Server 2003 drivers for your mother-board. A good place to find hardware with WHS support is the Windows Server Catalog (www.windowsservercatalog.com), a Microsoft site that lists all hardware that's been tested to work with Windows Server operating systems.

Backup Larger than Original

I followed *Maximum PC*'s "Clean Start" article (February 2009) and used Acronis True Image to set up a weekly full disk image. My XP Pro system is installed on C:, which is a 1.5 TB hard drive. I have another 1.5TB hard drive of the exact same make and model, to which I write the weekly image. I have 120GB of free space on the C: drive, but the backup drive is already full!

The destination drive contains no files except the image; is it possible for an exact image of a C: drive to be bigger than the original (by more than 10 percent)? Yes, I selected "incremental" as backup method.

—Matt Peuler

According to Acronis's website, an incremental backup can indeed be larger than the installation it's copied from, if you've recently defragged the primary drive. The solution is to create a new full backup of the drive after your defragmentation. This can also happen if you use Outlook and you've picked the Fast Incremental backup method; your .pst file changes constantly, and will increase the size of your image.

Dual-Channel RAM Not Recognized

My motherboard will not read dual-channel memory. It's a Biostar TForce 4; the CPU is an AMD 64 X2 dual-core at 3.2GHz with 4GB of DDR/400 RAM. On boot it only reads single-channel RAM. Is my motherboard going bad?

—Richard Bellucci

You likely have the RAM in the incorrect slots in the motherboard. This is a very common mistake, thanks to the lack of a unified standard for labeling slots. Even the most experienced system builders will flub this on occasion. Think of the dual-channel memory as a double-barreled shotgun. You need to populate each separate barrel or channel to run in dual-channel mode.

Looking at the manual for the TForce 4 AM2, it looks like you need to have your modules in the first two slots closest to the CPU. To check what mode your motherboard is running in, download the free CPU-Z utility from Cpuid.com and click the Memory tab. On the right-hand side, you should see the reported memory mode the board is currently in.

The Power Went Out

One evening my house's master breaker box was shut off while my computer was still on. I went into the BIOS and ensured that all my settings were set as before, but since then, every time I start up my computer cold it starts to spool up, then stops for about two seconds, and then boots. If I restart after my machine has been running for a while, it boots with no delay. I went into the BIOS to see if there was any problem in the APM settings, but I still got delays during cold boots. My last resort would be to cut the power again. Except for the annoying delay, it runs rock-solid in every game I throw at it—from Crysis to Modern Warfare 2. Hope you can puzzle out what caused it and the fix.

—JR Bivens

Usually power outages, brownouts, and spikes lead to hardware damage. This is a wild guess, but it's possible the damage is related to other devices connected to the machine. The pause during a cold boot suggests it's possibly related to something being initialized by the PC at startup. The first step is to make sure Quick Boot is disabled in the BIOS. Quick Boot bypasses some POST settings, so that could be causing the pause. So, enter the BIOS, go to the Boot menu, set Quick Boot to disabled, and then restart to see if that fixes it. If not, try disconnecting all of your external devices, printers, and USB hubs, and shutting down to see if you can replicate the issue. If it still occurs, you may want to try removing individual components from the machine, including individual DIMMs. Finally, one thing to consider: Are you sure the machine did not do this before the power outage? Cold boots usually take longer to start, as more hardware must be initialized. With a warm boot, most of the hardware is already, err, warm, and reboots are usually a few seconds faster.

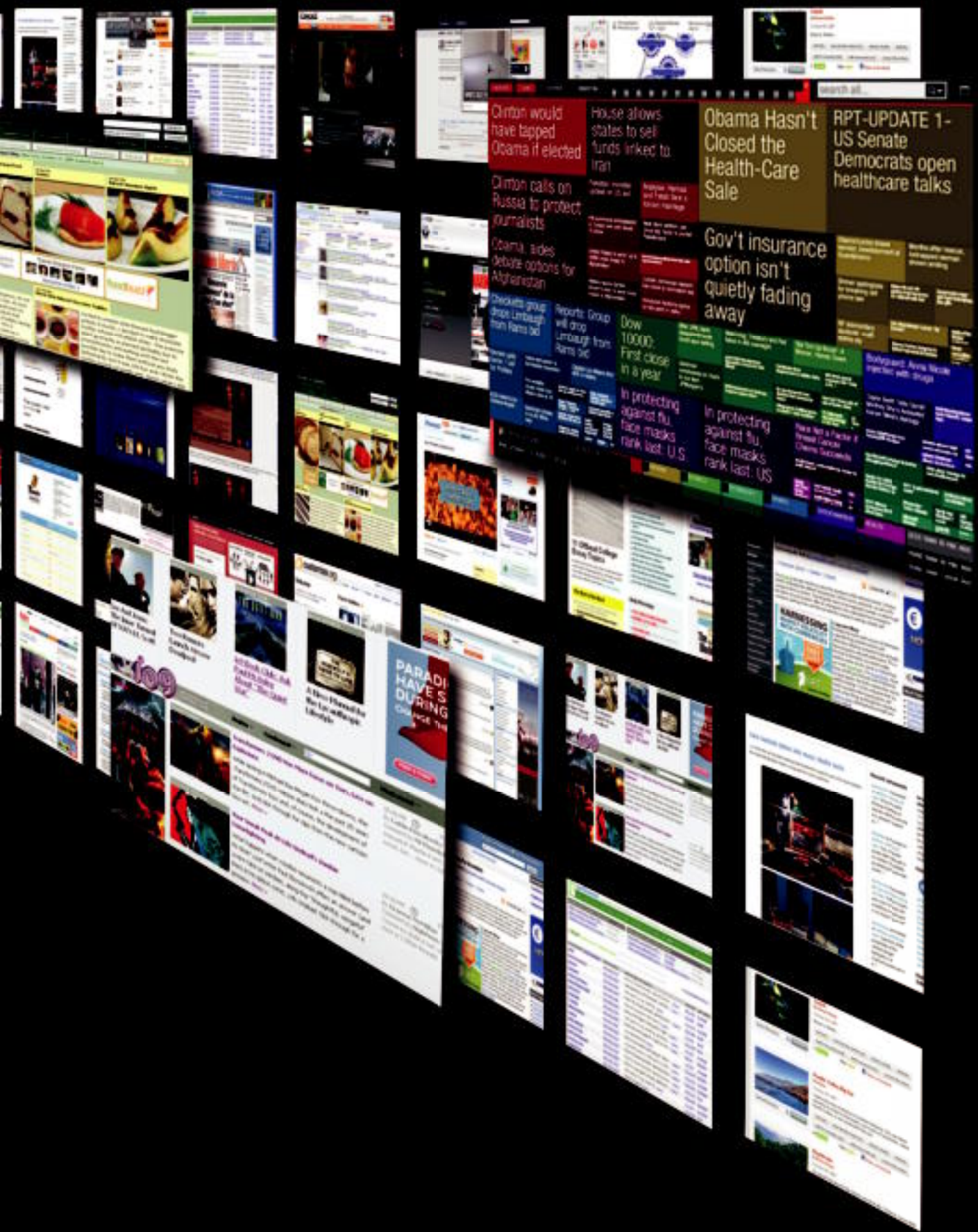
SITES Unseen

53 awesome websites you must know about

BY THE MAXIMUM PC STAFF

It's time to update the entries in your browser's links toolbar. But with recent estimates putting the size of the Internet at well more than 100 million distinct websites, it's getting harder and harder to get a handle on all the great stuff that's out there. That's why we've compiled this list. And unlike some lists you may have seen, which try to name the very "best" websites, but end up just telling you a lot of stuff you already know, we've chosen instead to highlight 53 of our favorite sites that fly under most people's radar. Think of it as the *Maximum PC* blog roll (remember those?). These sites represent great alternatives to popular web destinations like YouTube and Hulu, and include useful references, powerful web apps, and the unknown blogs you absolutely must bookmark.

You might have heard of some of these sites, but we'll bet you haven't heard of all of them. Read on and find out. You won't be disappointed.


Clinton would have tapped Obama if elected
House allows states to sell funds linked to Iran
Obama Hasn't Closed the Health-Care Sale
RPT-UPDATE 1-US Senate Democrats open healthcare talks
Clinton calls on Russia to protect journalists
Obama, aides debate options for Afghanistan
Gov't insurance option isn't quietly fading away
Dow 10000: First close in a year
In protecting against flu, face masks rank last: U.S
In protecting against flu, face masks rank last: US

MENTAL FLOSS

Learn a new interesting fact every day Did you know that giraffes have the highest blood pressure of any mammal? Or that Pope John Paul II was made an honorary member of the Harlem Globetrotters? No? Well, if you visited the Mental Floss blog (www.mentalfloss.com) regularly, you would. With informative posts, infuriating quizzes, and an "Amazing Fact Generator," the blog is required reading for wannabe smart-alecks.

INVESTOPEDIA

Demystify your investments If you're new to investing, the stock market and other financial institutions can seem like black magic—you put some money in, some charts go up and down, and hopefully you end up richer than you started. Enter Investopedia (www.investopedia.com), Forbes's collection of definitions and articles about all things financial. Written accessibly but not condescendingly, Investopedia will leave you feeling more confident about investing in no time at all.

1,001 RULES FOR MY UNBORN SON

There's more to life than the Internet A recent issue of Wired listed rules for the modern Poindexter—proper etiquette for techies in the 21st century. But while you may know the difference between a good and bad post on Twitter, how about the 10 hours of the day you're not on the Internet? 1,001 Rules for My Unborn Son (http://rulesformyunbornson.tumblr.com) is a blog of the important lessons that'll really help you get by in life. Rules like "Never eat lunch at your desk" and "Compliment your mom's cooking" might be common sense for most of the world, but it's sage advice for the unwashed geek masses.

GOODREADS

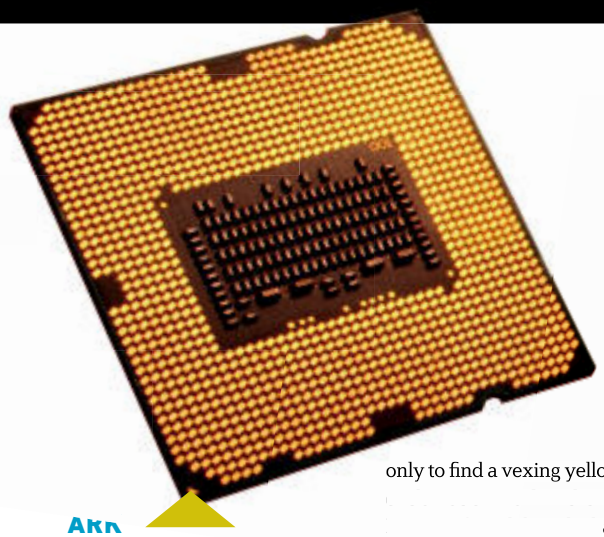
Where bookworms gather Always forgetting what books you've read? Wonder what your friends are reading? Social-networking site Goodreads (www.goodreads.com) helps keep track of both. Search for, rank, and review books you've read, plus get recommendations on what to pick up next. A dizzying array of recommended-reading lists rounds out Goodreads' appeal. A must for any red-blooded bibliovore.

CRAIGLOOK

Craigslist gets unstuck from 1995 Craigslist is undoubtedly the best online marketplace to barter or trade goods, but its interface and navigation system leave much to be desired. But since all of its content can be read through RSS feeds, you're not forced to actually use the Craigslist site. Craiglook (www.craiglook.com) is a mashup of Craigslist feeds (read through Yahoo Pipes) and Google Maps. Its location radius–based search is the site's most useful feature, and its content is always up to date with the main Craigslist directory.

KAYAK

Plan your next trip If you're looking for a quick weekend getaway, Kayak (www.kayak.com) can help you find the best deals on any destination, whether it's by plane, ship, or automobile. Kayak is a search engine that pulls information from hundreds of travel sites based on your query; you can then refine your search and choose the result that is right for you. We should mention, however, that domestic flights within the continental United States and Europe do not include economy airliners, such as Southwest and EasyJet.



ARK

Know all there is to know about Intel's CPUs Think of Intel's ARK site (http://ark.intel.com) as an IMDB.com for Intel CPUs and other sundry products. That way, the next time you're nerding out with friends and someone wonders, "Just what was the highest-clocked Intel CPU ever?", you can head over to ARK and find out there were two: the 3.8GHz Pentium 4 670 and the 3.8GHz Pentium 4 672. ARK will even tell you each chip's TDP, die size, transistor count, and all the compatible Intel chipsets.

PCIDATABASE AND QBIK

Be a hardware detective Have you ever finished installing the drivers on a system only to find a vexing yellow)evice ad vhat it is or how to figure it ... A good hardware detective first gets the hardware ID. You can do this by double-clicking the device in Device Manager, selecting Details, and then looking at the Hardware IDs. If it's a PCI device, PCIdatabase (www. pcidatabase.com) can tell you who makes the device. Qbik (www.qbik.ch) can do the same for USB devices.

OPENWITH

Decode the language of file extensions OpenWith (www.openwith.org) is a comprehensive database of file extensions for whenever you come across an unknown file type. This essential website is updated frequently, easy to browse, and even links you to freeware applications to open your cryptic files. In fact, the advocacy of free software to open documents is paramount in the site's mission statement.

PDFGENI

Find any PDF reference manual Pdfgeni (www.pdfgeni.com) is a search engine dedicated to indexing PDF files scattered all over the web. It's extremely useful for finding technical manuals that you might have thrown away, without having to dig through the manufacturer's website. It's also great for finding ebooks and obscure academic documents.

GETHUMAN

Skip the robot, talk to a person These days, calling tech support can be a nightmare involving long hold times, unintelligible outsourced operators, and "Tier 1" technicians who almost inevitably know less about the product in question than you do. But the worst of all tech-support injustices is the touch-tone menu labyrinth you often have to follow before reaching a real person. Well, you don't have to put up with all that, thanks to Gethuman (www.gethuman.com), which tells you exactly what number to call and what buttons to press to get through to a real, human operator.

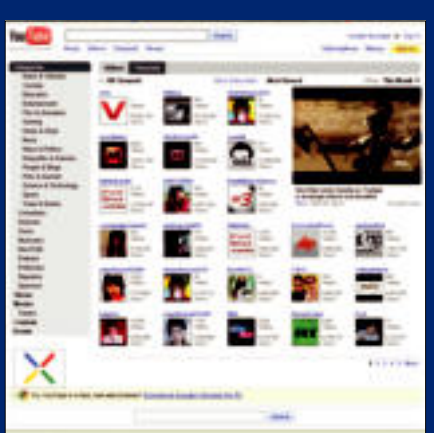
LITE SITES

Keep It Simple and Clutter-Free

Less robust machines, such as the ubiquitous netbooks, can benefit from the streamlined "lite" versions of popular online programs. Facebook Lite (http://lite.facebook.com), for example, gives you lean views of friend feeds and your user profile. You get access to essential image and update posting functionality without being bothered by the newest Facebook game apps.

YouTube Feather (www.youtube.com/feather_beta), although still in beta, limits features and the number of bytes downloaded by the browser for viewing videos with the lowest latency possible.

And finally, there are a multitude of mobile versions of web apps (m.*.com) that are specifically optimized for systems with limited resources.



THE INTERACTIVE FICTION ARCHIVE

Play thousands of free, awesome games "Interactive fiction" refers to text-based adventure games, which rely on clever writing and imagination rather than fancy graphics. Although you're probably more familiar with the classic interactive fiction games that were popular around the dawn of PC gaming, such as Zork and Adventure, there are plenty of enthusiasts still hard at work turning out new and innovative works in the genre, and The Interactive Fiction Archive (www.ifarchive.org) is the place to go to find them.

KONGREGATE

Play Flash games in style What do you get when you combine time-wasting Flash games, an Xbox-like achievement system, a social network, and a collectable card game? You get Kongregate (www.kongregate.com)—the best Flash game hub on the net.

IO9

Be a sci-fi superfan OK, so io9 (http://io9.com) is a Gawker blog, and therefore not exactly "under the radar." Nonetheless, it's one of the lesser-known sites on the blog mega-network, and an absolute must-read for any science fiction fan (we know you're out there). All mediums get covered—TV shows, movies, books, and even comics. The editors know their Cylons from their Cardassians, and the editorials reach beyond the scope of the typical geek debates.

TOR

Get your sci-fi short story fix If you're a science fiction and fantasy aficionado, Tor (www.tor.com) is for you. A free membership to this publisher's site gets you access to exclusive ebooks, and casual browsers can still dive into a wealth of short stories, comics, art, and the site's delightful blog.

YANKO DESIGN

Glimpse into the possible future Do high-concept gadgets like the Optimus Keyboard tickle your fancy? Yanko Design (www.yankodesign.com) is a blog that focuses entirely on futuristic design concepts from studios like Art. Lebedev. The products showcased are mostly conceptual renders and may never see production, but occasionally, you'll find a forward-thinking idea that perfectly combines form and function.

LET'S PLAY ARCHIVE

Let other people play games for you The Let's Play Archive (www.letsplayarchive.com) maintains a list of hundreds of "Let's Play" games, where somebody plays through a video game while maintaining a journal using text, screenshots, and videos. Some are funny, while others just give you a whirlwind tour of a game you've never played before. Sound dumb? Give it a try—you might just find it more engrossing than you'd imagined.

SOYOUWANNA

What they didn't teach you in school So you wanna… audition for *American Idol*? Bottle your homemade beer? Get a travel visa to a foreign country? SoYouWanna (www.soyouwanna.com) provides instructions on all sorts of projects, from the common to the obscure. Note: Some of the content on the site in not work-safe.

IKEAHACKER

Outsmart the Swedes at their own game If you've been a college student or a 20-something living on a budget in the last couple decades, chances are good there are a couple of bits of Ikea furniture gracing your living quarters. The Ikeahacker blog (www.ikeahacker.blogspot.com) shows you how other people have transformed their old Swedish furniture into something awesome.

For more Ikea fun, check out Ikea Heights (www.ikeaheights.com)—an episodic melodrama shot in a Burbank, Calif., Ikea store, without the store knowing.

HOWCAST

Instructional videos that are actually coherent

From mundane tasks like washing your hair to complicated ventures like how to finance a home, Howcast (www.howcast.com) hosts instructional videos that can help you get by in life. User-shared videos are well produced and get straight to the point, unlike most of the stuff you'll find on YouTube.

MAKE: ONLINE

Advanced crafting for hobbyists Like to get your hands dirty? Makezine's blog, Make: Online (http://blog.makezine.com), is a treasure trove of links to geeky craft projects found all over the web. From circuit-bending tutorials to DIY robots, you'll find all sorts of nifty projects that'll get your inner inventor stirring. And even if you're not the hacking type, the linked projects are a joy to read.

GOOD-TUTORIALS

Paint a pretty picture You don't have to be a designer to learn how to touch up photos, create your own graphics, or conjure up fancy web buttons. Good-Tutorials (www.good-tutorials.com) is one of our favorite resources for making the most out of our entire Adobe Creative Suite. Additionally, if you've got a knack for web design, this site can help with CSS, Flash, Java and PHP.

VUVOX

Make slick-looking web-photo collages Vuvox (www.vuvox.com) is a web app that lets you take a collection of images, videos, and song files, and turn them into a rich, scrolling web collage. A set of simple photo-editing tools lets you show only the best parts of your photos, and you can add info boxes that expand when moused over. When you've created the perfect collage, you can embed it on your blog or other website, or pass a link around on Twitter.

FFFFOUND

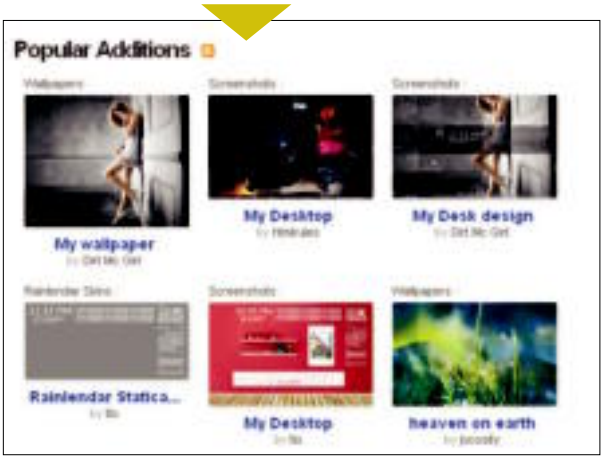
Get inspired Ffffound (www.ffffound.com) is a web service that allows users to post and share their favorite images found on the web and recommends similar images according to each user's taste. It's a great resource if you're looking for some inspiration, or need an image that matches a particular aesthetic. Ffffound displays graphic designers' works, typography, advertisement design, animations, and sometimes even the latest meme. Some of the site's content is NSFW.

INTERFACELIFT

Find the perfect wallpaper InterfaceLift (www.interfacelift.com) might not be the biggest desktop wallpaper site on the Internet, but it is one of the best organized, with easy sorting by resolution, rating, or tag. With thousands of gorgeous photos and illustrations, available in tons of resolutions (including dual- and triple-monitor resolutions), Interfacelift is definitely worth a look next time you want to refresh your PC's wallpaper.

CUSTOMIZE

Spruce up your desktop Customize (www.customize.org) is the biggest and best resource for pretty much any aspect of the desktop-customization scene. On it, people post screenshots of their desktops, tricked out with popular apps like Litestep, Samurize, and Rainlender, and share how they're made. The site also hosts themes and skins for those apps and others, along with helpful how-to guides.



PREZI

Pitch a meeting Microsoft's PowerPoint is truly a hassle to use when you've only got a few hours to put together a full-blown presentation. Thankfully, procrastinating professionals can turn to the free web service Prezi (www.prezi.com). Prezi takes about five minutes to learn and the slide show is really just one big easel. And if you want to get super creative, there are numerous tutorials that teach you how to jazz up your presentation with animated segues and mind-mapping techniques that will inspire your audience to think outside of the box. Best of all, it's all hosted online, so you don't have to worry about anything happening to your expense report.

DROP.IO

Collaborate in real-time without the Wave

Yes, we know everyone is excited about the potential of Google Wave as an end-all solution for real-time project collaboration. But in its beta state, Wave is too buggy and slow to earn our recommendation. Drop.io (http://drop.io) takes a simpler approach to real-time collaboration: Users share online "drop" repositories which host documents and images. We dig that Drop.io doesn't require complicated user accounts or unnecessary social networking elements. Yahoo apparently feels the same way, and has pre-installed Drop.io's Attach Large Files feature into every Yahoo mail account.

LABS

Beta Test the Web

Tech giants like Google and Microsoft are continually testing web projects that try to intuit how we'll leverage new computing power to surf the net, and many of these experiments are available to try out right now. Microsoft's Live Labs showcases practical uses for its image-scaling Seadragon technology, while Google Labs hosts dozens of side-projects its engineers create in their spare time. Many web services we take for granted today, like Google Street View or Adobe Air, originated from these Labs sites. If you want to sneak a peek at the potential future of the Internet, here are five Labs you can't afford to miss:

- → **GOOGLE LABS** (www.googlelabs.com)
- → **MICROSOFT LIVE LABS** (http://livelabs.com)
- → **MOZILLA LABS** (https://mozillalabs.com)
- → **ADOBE LABS** (http://labs.adobe.com)
- → **HULU LABS** (www.hulu.com/labs)

NEWSEUM

Keep up with the local news Curious about what's on the front page of newspapers elsewhere in the world? Look no further than Newseum (www.newseum.org), which offers downloadable PDFs of more than 80 major international and domestic newspapers.

WEATHER UNDERGROUND

The most accurate weather reports We know, your gut instinct tells you to go to Weather.com to check for local weather conditions or the weekend forecast. But Weather Underground (www.wunderground.com) provides better local reporting by tapping into a network of 10,000 local weather stations in all major cities across the United States. A community-powered reporting system provides detailed hourly updates, which are especially useful when planning your commute during the rainy season.

GOOGLE BUILDING MAKER

Crowd-sourcing the 3D world Fourteenth-century cartographers would be right about Google Earth—its world is pretty flat. Despite high-res satellite imagery that lets you zoom in on your neighbor's skylight, buildings are still part of one big flat surface. That's where you come in. Google's Building Maker (http://sketchup.google.com) is a website that lets you help design and create buildings for Google Earth. Using a plugin-based version of the Sketch-up modeling program, you can easily create a textured 3D model of your neighborhood or local landmarks and submit them to be included in the Google Earth database. Google has rolled out the service to 50 cities so far, but plans on expanding its reach in the future.

Another steak, another US map (this one sent in by Radich Kulker).

STRANGE MAPS

Strange maps are strange If you've got a fascination with maps, or an affinity for world history, Strange Maps (http://strangemaps.wordpress.com) posts interesting maps several times a week, complete with related facts and statistics about the featured area in blog form.

THE BIG PICTURE

Telling it like it is, in pictures It's been predicted that photojournalism would die at the hands of the ubiquitous camera phone, but one visit to the The Boston Globe's The Big Picture (www.boston.com/bigpicture) will assure you that photojournalism is alive and well. The Big Picture collects some of the best photojournalism of the day and presents it in a higher resolution than is typically available on the Internet. Sometimes inspiring, sometimes saddening, it's worth a daily visit.

NEWSMAP

See the world's news at a glance As Google News has become the single-largest aggregator of local and global news, there have been several attempts to rearrange all that data into a more readable form. Newsmap (www.newsmap.jp) is one such effort. It organizes stories into a big, colorful tree map, based on category (business, technology, sport, etc.) and importance, measured by the number of outlets reporting on a story.

FATBURGR

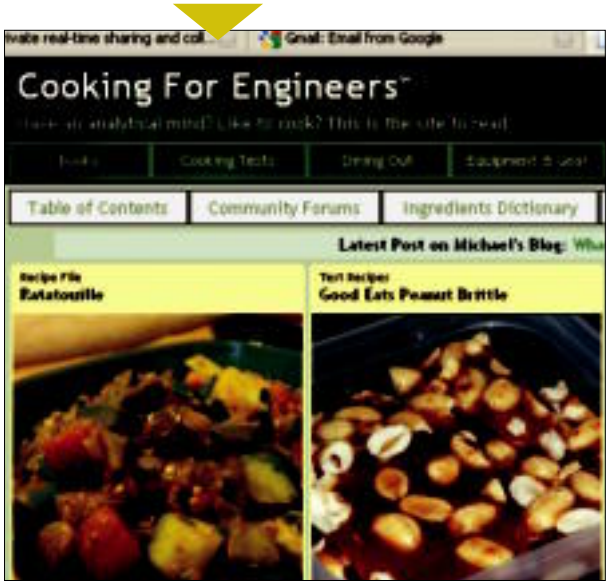
Count your calories

Also a popular iPhone app, Fatburgr (www.fatburgr.com) helps you count calories and make healthier decisions when eating out at various popular dine-in and fast-food restaurants. Simply pick your poison (ours is Panera Bread) and Fatburgr will present you with an alphabetical list of the restaurant's entire food inventory, along with the number of calories, grams of fat, carbohydrates, and fiber in each serving.

COOKING FOR ENGINEERS

Learn to cook like a nerd

If you're the type who thinks of cooking as more a science than an art, then Cooking For Engineers (www.cookingforengineers.com) is for you. With lots of recipes written out and photographed in excruciating detail, and interesting cooking "experiments," this site will help you make the transition from computer nerd to kitchen nerd.



GROOVESHARK

A social music platform to replace iTunes Music recommendation services like Pandora and Last.fm are useful for discovering new music, but if you just want to create a custom playlist of songs you already know you like, Grooveshark (www.grooveshark.com) is an excellent free music streaming resource. Its database of music label–licensed and user-uploaded songs is sufficiently comprehensive, and we like its ability to generate an embeddable music player widget with any playlist you create. And for the indecisive, Grooveshark has a social feedback engine that can generate song recommendations, as well.

THESIXTYONE

Listen to music, level up

Tired of music sites that just let you listen to music? Wish more stuff in your life had RPG elements? Then you should definitely give TheSixtyOne (www.thesixtyone.com) a look. A music site with a decidedly indie slant, songs on TheSixtyOne are uploaded by artists themselves, and voted on by users. The gimmick? Whenever a song that you've voted for goes on to be voted for by others, you gain experience and levels. There are also achievements (such as listen to 1,000 songs) and quests (for example, listen to seven recently posted songs), so you'll always have something to work toward.

MUSICOVERY

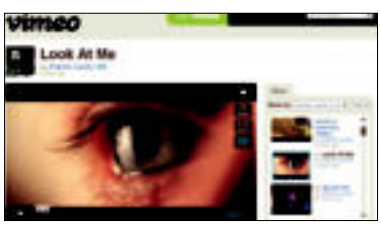
Find new music, the colorful way Musicovery (www.musicovery.com) is a music-finding service that's a little different than the rest. To get music recommendations, you just specify a list of genres that you like, a timeframe, and whether you want your music calm or energetic, dark or positive. Musicovery searches for matching songs, and displays them in a color-coded map. Its library isn't as big as some others, but the colorful visuals and unusual song selections make it worth a visit.

DRINKHACKER

Learn how to drink in style Nothing says "sophistication" and/or "problem drinker" like leaving Drinkhacker (www.drinkhacker.com) open in your browser. With well-written reviews of spirits and intriguing cocktail recipes, Drinkhacker's got something to offer even the most casual drinker.

CRACKLE

Watch TV shows and movies you can't find on Hulu NBC's Hulu may be the dominant video-streaming service for legally watching TV shows and movies, but its catalogue isn't nearly comprehensive. Rival service Crackle (www.crackle.com) fills in missing shows and films owned by Sony Pictures, in case you want to watch movies like *Ghostbusters* or *Groundhog Day*. Crackle's collection isn't as big as Hulu's, but there are plenty of hidden gems here (*Karate Kid II*, anyone?).



VIMEO

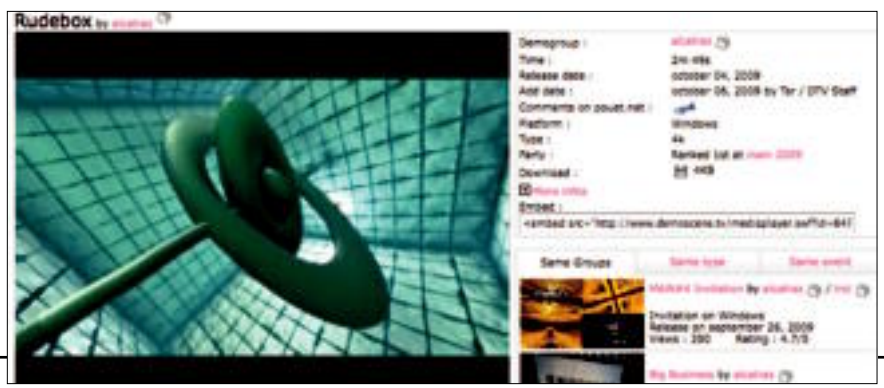
The best place to upload your videos We've lost all hope for YouTube. Vimeo (www.vimeo.com)—founded by the creators of CollegeHumor—is the premium cable equivalent to Internet video. The simple upload process, relatively quick processing times, and elegant video interface make this our preferred video hosting site. The moderated channels have high-quality content (there's even a channel for anaglyph 3D video!), and the community has more than a single-digit lexicon.

TV TROPES

Read before engaging in mature Internet discourse TV Tropes (www.tvtropes.org) is a comprehensive wiki of literary devices used in popular fiction, including tropes (different from clichés) used in most television shows today. Be wary, the site is a deep dive into the craft of story writing, and will change the way you enjoy books, television, and movies forever.

DEMOSCENE.TV

See what can be done with four kilobytes If you're any kind of nerd at all, you probably know about the demoscene, where talented programmers create complex videos rendered in real-time, stored in incredibly small files. Demoscene.tv lets you see what all the fuss is about without having to download and run an executable—think of it as YouTube for the scene. And if you like what you see, the full demo executable is just a click away.



KNOW YOUR MEME

Stay up to date with the Internet Pardon us for suggesting that our readers are out of touch with the latest Internet memes, but we've seen the statistics on how many average Internet users aren't hip to online fads. For this reason, Know Your Meme (www.knowyourmeme.com) exists to give your friends and family all an equal chance to laugh at, or with, the Internet.

Oldies but Goldies

Websites that have withstood the test of time to hold a permanent place in our bookmarks

The Inquirer

Over here in the colonies, we like to think we invented snarky Internet reporting. The truth is, snarky reporting is an English innovation and it doesn't get any snarkier than The Inquirer (www.theinquirer.net). Sometimes right and sometimes wrong, it seems no tech rumor or innuendo is too frivolous for The Inq.

Ars Technica

One of the oldest and best-respected technology sites on the Internet, Ars Technica (www.arstechnica.com) has been serving up news and in-depth analysis from around the tech industry since 1998, and we continue to love every morsel of it.

Pandora

An offshoot of the Music Genome Project, Pandora (www.pandora.com) has become a hugely popular Internet radio app—and for good reason. Input a few songs or artists you like, and Pandora searches its database for songs that share its traits, then creates a custom station based on those results. It's a great way to discover new music and listen to old favorites, too.

Reddit

Of all the social news aggregators, Reddit (www.reddit.com) is the one that best meshes community and technology—its user-submitted (and community-approved) posts are typically more interesting and fresh than what you'll find on algorithm-driven sites like Digg and StumbleUpon. In an Internet culture where seeing a viral link first is a badge of honor, Reddit is an invaluable resource.

Shacknews

For PC gaming news we actually care about, we turn to Shacknews (www.shacknews.com). Shacknews cherry-picks news that's substantive; we respect that it eschews the sensationalism of tabloid gaming blogs. What also keeps us coming back to "the Shack" is its engaging community of commenters, which include game developers and other industry luminaries.

Fatwallet

There are a lot of sites out there that promise to save you money, but only a few you can actually count on for good deals, all the time. The most reliable? Fatwallet (www.fatwallet.com)—a community site for bargain-hunters. The Top Deals section is great, but some of the best deals can be found in the user forums.

Rotten Tomatoes

With movie tickets getting more expensive by the day, it's more important than ever to be able to skip the cinematic stinkers. Reviews help, but can you really trust a single critic? We prefer Rotten Tomatoes (www.rottentomatoes.com), which lets you see what all the critics are saying. Choose the Top Critics tab to see just the reviews from the most trustworthy pundits.

New York Times

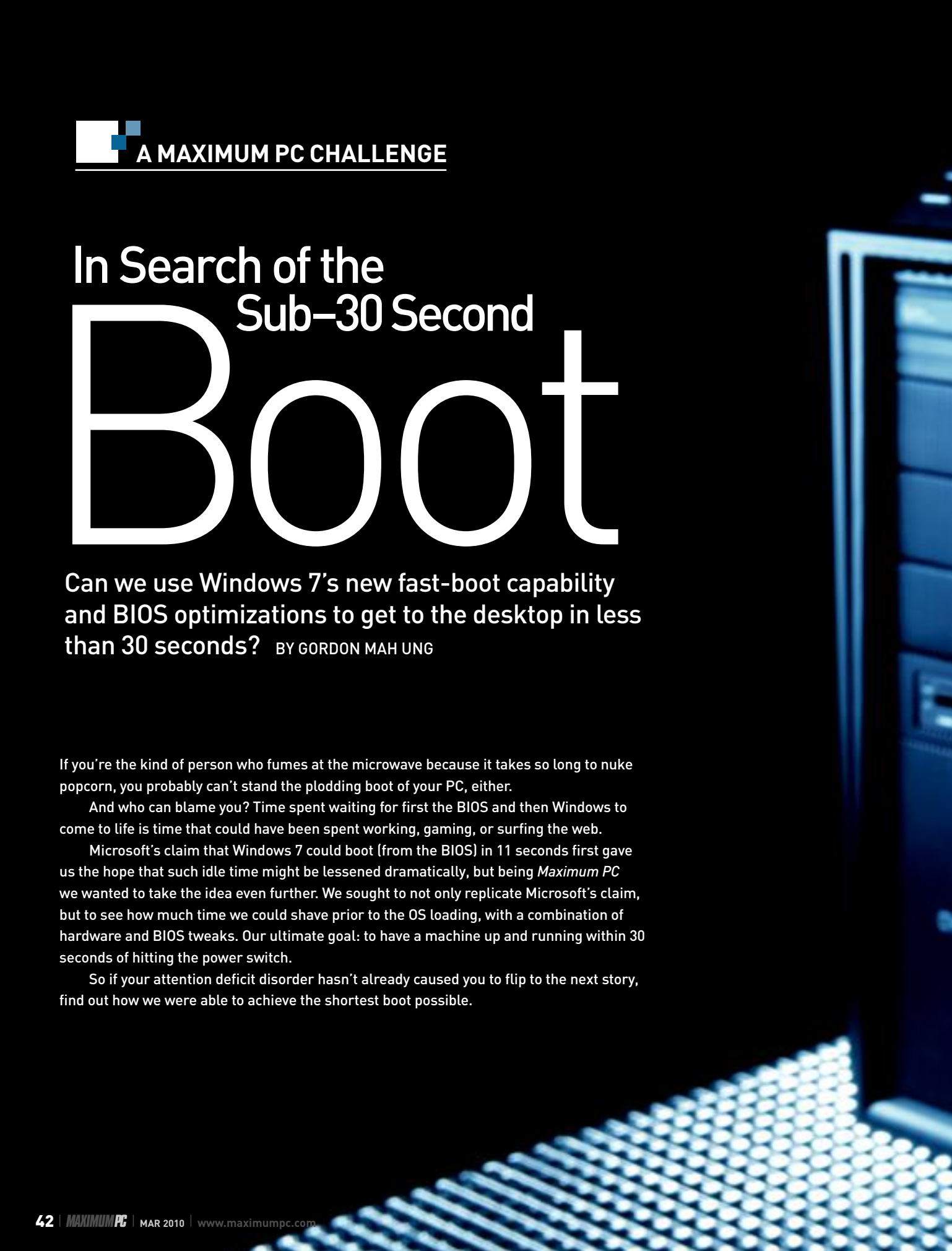
There's no shortage of news online, but the *New York Times* has one of the best-funded, best-staffed, most prestigious newsrooms in the world, and it shows in its website (www.nytimes.com). The front page is a good place to start, but we also make sure to check the Technology and Science sections every day.

A MAXIMUM PC CHALLENGE

In Search of the Sub–30 Second Boot

Can we use Windows 7's new fast-boot capability and BIOS optimizations to get to the desktop in less than 30 seconds?

BY GORDON MAH UNG



If you're the kind of person who fumes at the microwave because it takes so long to nuke popcorn, you probably can't stand the plodding boot of your PC, either.

And who can blame you? Time spent waiting for first the BIOS and then Windows to come to life is time that could have been spent working, gaming, or surfing the web.

Microsoft's claim that Windows 7 could boot (from the BIOS) in 11 seconds first gave us the hope that such idle time might be lessened dramatically, but being *Maximum PC* we wanted to take the idea even further. We sought to not only replicate Microsoft's claim, but to see how much time we could shave prior to the OS loading, with a combination of hardware and BIOS tweaks. Our ultimate goal: to have a machine up and running within 30 seconds of hitting the power switch.

So if your attention deficit disorder hasn't already caused you to flip to the next story, find out how we were able to achieve the shortest boot possible.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TIMING IS EVERYTHING

How we systematically shaved precious seconds off our reference rig's boot time

How fast can Windows 7 boot? In 11 seconds, Microsoft claims. And to prove it, the company even demonstrated the feat to a room full of technical press. But even if you take MS at its word, that's really only half the story. Microsoft's demo proved how fast a Win7 PC could boot once the hardware handed off the booting process to the operating system.

For our challenge, we included the BIOS, as well.

Obviously, the most important factor there is the motherboard. For our platform, we decided to go with Intel's everyman socket: the LGA1156. In choosing the board, we considered four possibilities—two different Asus boards, an Intel, and a Gigabyte—before settling on Gigabyte's GA-P55-UD6, primarily for its Quick Boot feature (more on that later).

For storage, we decided that an SSD with its ultra-fast random-access time was the only way to go. Furthermore, that's what Microsoft used in its own boot demo. We auditioned three different drives—one using SLC NAND, another using the highly regarded Indilix controller, and the third being Intel's second-generation 34nm 160GB X25-M drive. All three had similar boot times but we opted for the X25-M 160GB because it was the only one that supported the TRIM command at the time. Windows 7 natively supports TRIM, which can greatly increase SSD performance when writing to sectors that have been previously used and then erased.

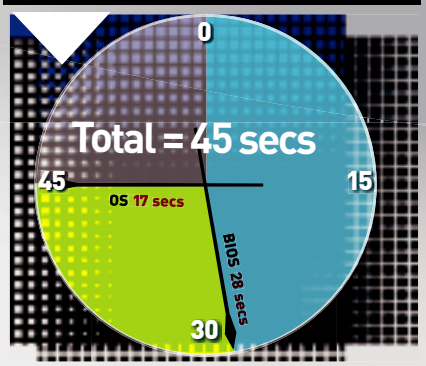
Other hardware in our rig included 4GB of DDR3/1333 (going with 8GB added an additional 1.5 seconds to our boot), a SATA optical drive, and an EVGA GeForce GTX 280 card. Initially, we thought a GPU with a fat 1GB frame buffer might impact the POST (that's a lot of RAM to initialize), so we also tried a low-end GPU with a 256MB frame buffer, but saw no change in boot times. Our OS choice: Windows 7 Ultimate.

The start-to-finish boot of our reference rig: 45 seconds.

IMPROVING POST PERFORMANCE

For the record, Microsoft used a reference board design for Intel's Capella mobile platform for its boot demo, along with a 1.7GHz Core i7 mobile processor and an older 80GB Intel SSD drive without TRIM. We should note that mobile platforms are inherently faster at booting because they are complete optimized systems with far fewer parts to power on and inventory. A typical laptop will get through POST in less than 10 seconds, with some taking as little as five. BIOS maker Phoenix has even demonstrated a notebook PC using UEFI that can POST in one second. Desktop boards, however, with their infinite hardware variability, POST far slower. One of the appealing features in Gigabyte boards is the Quick Boot setting in the BIOS that lets the board POST faster if the hardware has not changed. With the Quick Boot setting enabled, we saw the POST time go from 28 seconds to 17 seconds. We then shut off extraneous hardware such as the floppy port and serial port, made the hard drive the first boot device, and disabled other boot devices, as well. By doing this, we shaved another two seconds off the boot time. Disabling the unused FireWire port and SATA ports that were not in use didn't decrease the POST time, but we saw Windows 7's boot drop by a second or two.

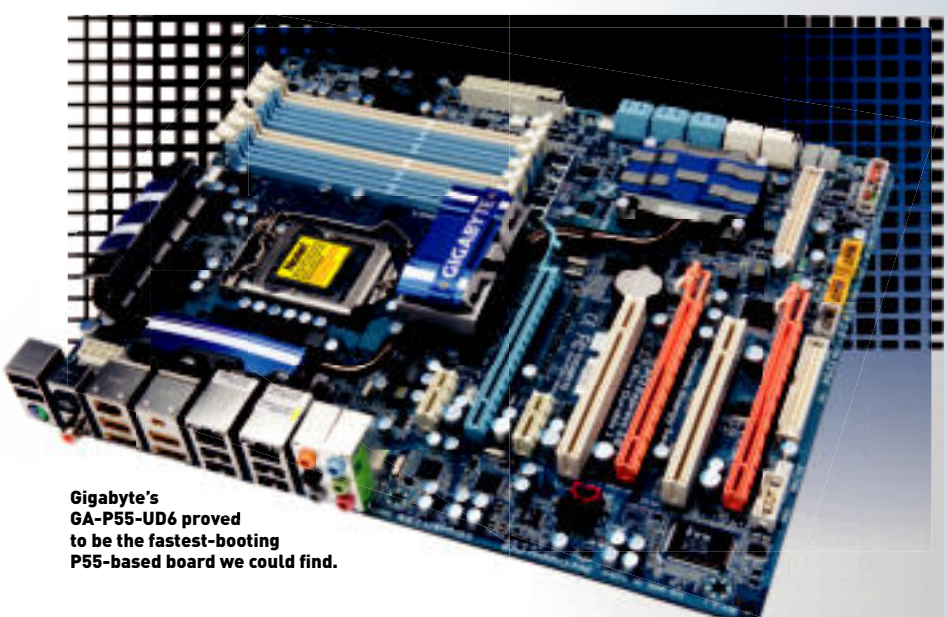
BEFORE



You can save a few microseconds (or more, depending on your board) by booting all your drives off the native south bridge instead of any discrete controllers. If you have just two hard drives and a SATA optical, it's more time-efficient to have all three connected to the chipset's native controller instead of a third-party controller. Some BIOSes may also enable spinup timers for hard drives by default. This gives mechanical drives time to spool up before the board tries to boot to those. Lowering these timers can save you seconds.

IMPROVING WINDOWS 7 PERFORMANCE

Microsoft is obviously pleased with itself for



Gigabyte's GA-P55-UD6 proved to be the fastest-booting P55-based board we could find.

making Windows 7 boot lickity-split, but we were convinced we could shave even more time by optimizing the OS. We disabled Aero, turned off system restore, disabled services, turned off the boot splash screen, and even tried enabling ReadyBoot. ReadyBoot is supposed to help a machine boot faster but is disabled by default if an SSD is the primary boot device.

Sadly, none of this made a difference.

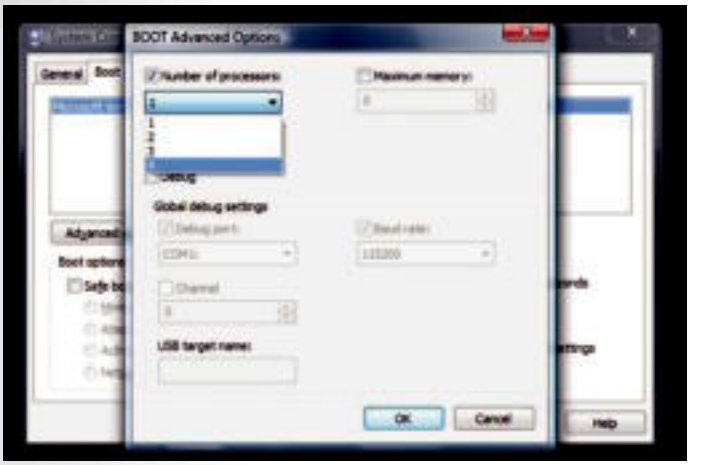
We even tried the old Internet lark of "enabling" more cores for booting using the Boot Advanced Options tab in msconfig. This tip has been kicking around since the days of Windows Vista. While some people claim it works, we saw no difference, and during one run, we saw boot times get significantly worse, requiring us to reinstall the OS to correct it. Though tempting, the setting is for debugging purposes, and as far as we could find, has no practical impact on boot performance.

Finally, we repeatedly rebooted the machine. Windows 7 (and Vista) includes a self-tuning routine to decrease boot times. We booted the OS, let it sit for a few minutes, and then repeated the task 25 times—although 10 times is reportedly sufficient. (To do this automatically, use PassMark.com's free Rebooter app).

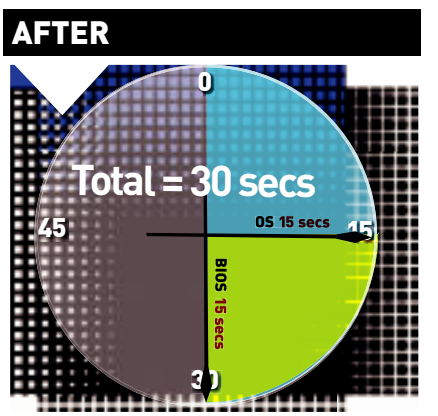
THE RESULT

Did we get our rig to boot in less than 30 seconds? No, but we hit 30 seconds exactly—a 33 percent improvement over our original boot time. With our BIOS tweaks, we managed to get our P55 board to seemingly hand over control to the OS in 15 seconds. However, Windows 7's built-in performance-measurement tool then repeatedly told us our machine was up and runni
while our stopwatch told u
was booting to a usable state in 15 seconds. Which is right? That likely
exactly you start the clock
There is a gray area during
to the OS that is apparently
Microsoft's measurement tc
we'll accept that we did tec
the 11-second boot of the C
have preferred to shave thc
onds from the stopwatch, t

But is all this effort for a
necessary? Frankly, with W
Sleep feature, boot times ar
nificance. A combination of
bernate, the feature lets you
a fully responsive state in less than three seconds with the click of the mouse. Since the machine is in a suspend-to-RAM state, there's no POST to go through, and no initializing of



Internet rumor site Snopes.com should have an entry for this one: By setting your OS to use all four cores during boot, you can shave a ton of time off your boot time. Unfortunately, it's not true.



SSD VS. HDD

How Does a Hard Drive Impact Boot Performance?

Besides having no moving parts that can break and blazing throughput speeds, SSDs also have incredibly low access times. How low? In our tests, the hella-fast 10,000rpm 300GB Western Digital VelociRaptor had a random-access time of 7.24ms, while the original Intel X25-M SSD had an access time of 0.12ms. A typical 1.5TB 7,200rpm drive sits at 15ms. Since booting Windows doesn't involve reading one fat contiguous file on the disk, but rather picking out thousands of small files, random access is assumed to be key for booting an OS.

To see how much of a difference an SSD makes over an HDD, we replaced the 160GB Intel X25-M SSD in our test platform with a Seagate 1.5TB 7200.11 Barracuda HDD, installed Windows 7 Ultimate, installed the same drivers, and configured the machine exactly as we had previously. The Intel SSD hits in excess of 210MB/s reads, while the 7200.11 tops out at 100MB/s over the entire platter but reaches into the 130MB/s range for the first 200GB or so.

While our SSD-based install took 15 seconds once the board handed off control, the hard drive took 30 seconds. That's a 100 percent improvement with the SSD. But is it worth the price premium? To many folks, probably not. Keep in mind, however, that the SSD not only improves boot time, it will give you optimum overall system responsiveness and performance throughout its capacity. Mechanical drives decline in performance as they get full and fragmented. On the other hand, a 1.5TB drive offers almost 10 times the storage of a 160GB SSD.

MAXIMUM PC
2009 GAMING AWARDS

And the Envelope, Please...

BY THE MAXIMUM PC STAFF

The games are played, the votes are tallied, and our crack team of vote tabulators has tabulated the results. We've played literally hundreds of games this year—big games, small games, good games, and games that just plain sucked—solely for the purpose of presenting you, our adoring audience, with the undisputed list of the finest moments, experiences, and surprises in gaming for the year 2009. Without further ado, we now commence Maximum PC's Gaming Awards!

Game of the Year

Batman: Arkham Asylum

For us, Arkham Asylum isn't just an action game, it's the ultimate Batman simulator. All the feats we've associated with the Caped Crusader—creeping in the shadows to evade danger, silently taking out thugs while instilling fear, and even utilizing high-tech bat-gadgetry—were realized in-game. And like Batman, we had to use a combination of these abilities to effectively fight burly minions and bosses.

The game didn't fall short in the story department, either. The villains in Batman's rogues gallery brought unique gameplay twists and combat challenges, often requiring that we use our bat-brain in addition to bat-brawn to best each foe. Scarecrow's level-warping mind games were a definite highlight—we'll never forget the scene where Batman is forced to face his parents' murder. Arkham Asylum is the best game of 2009 not because it's a great Batman game, but because it's the definitive Batman experience. And Mark Hamill's reprise as the Joker may be the best performance we've ever seen in a game. **www.batmanarkhamasylum.com, ESRB: T**

The Fab Fad Mashup

Plants vs. Zombies

Like chocolate and peanut butter, tower defense games and zombies were made for each other. But it took the twisted genius of casual-gaming impresario Popcap to build the towers out of wacky plants. Instead of harvesting energon cubes and shooting bullets at aliens, you'll collect sunlight and fire peas at zany zombies. The battle rages in front, behind, and even above your home as you repel the undead hordes. **www.plantsvszombies.com, ESRB: E10+**

Best Reason to Have Friends

Borderlands

What do you get if you take four people, a couple of hopped-up dune buggies, and an infinite number of pistols, rifles, rocket launchers, and sub-machine guns? Simply the best multi-player experience of 2009, that's what. By combining the frenetic action of hardcore twitch first-person shooters with the progression treadmill and loot-whoring of Diablo-esque action RPGs, the kids at Gearbox made something unique—a c multiplayer that's greater than the sum of its parts.

While Borderlands isn't perfectly polished—there are still problems playing with people above or below your level range the experience is not to be missed. After tweaking routers and disabling firewalls, we settled in for many nights of bliss, mowi down hundreds of mutants and monsters using an arsenal that ranged from silly to just plain awesome. Where else can you ki mutant midgets with a shotgun that fires flaming rockets? **www.borderlandsthegame.com, ESRB: M**

Most Epic RPG

Dragon Age: Origins

We were doomed from the moment we opened the Dragon Age box. A dark-fantasy BioWare RPG and the spiritual successor to the Baldur's Gate saga, Dragon Age sucked us in with its super-in-depth story, shades-of-gray moral choices, memorable characters, and great combat. Yes, Virginia, there is a BioWare RPG with great tactical combat.

Though it hews to a familiar fantasy setting, full of elves, dwarves, and wizards, Dragon Age goes out of its way to subvert some of the genre's most cherished tropes. Elves are oppressed and live in ghettoes, dwarves don't speak with Scottish accents, and the moral landscape is ambiguous. The first five hours or so are taken up by one of six different origin stories, which converge in an epic battle. Only then does the game truly begin. And it's wonderful: violent, moody, unpredictable, and full of delightful surprises. For a good time, crack open a glass phylactery!

We easily sunk 80 hours into our *first* play-through—without buying any DLC or the forthcoming expansion pack. And then we rolled another character and started again. **http://dragonage.bioware.com, ESRB: M**

Best Platformer, Worst Shooter

Mirror's Edge

Mirror's Edge does something we thought impossible—it's a first-person parkour game that's both fun and skill-based enough to warrant hours spent perfecting speed runs through the awesome rooftop levels. But the whole thing falls apart when dudes with guns show up. With no weapons of your own, save the ones you lift off unconscious baddies, the combat ranges from frustrating to infuriating, tainting an otherwise transcendent gaming experience. **www.mirrorsedge.com, ESRB: T**

The Michael Bay Award for Massive Explosions and Excellence in Storytelling

Call of Duty: Modern Warfare 2

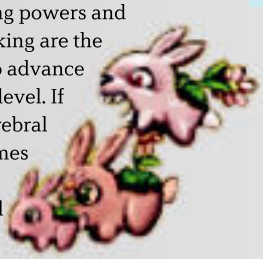
Two years ago, we gave the first Call of Duty: Modern Warfare a very similar award, and Modern Warfare 2 follows perfectly in the original's footsteps. While it's not a perfect game, the single-player experience is the same unrelenting, pulse-pounding action trip that we loved in the first game—hokey story and all. **www.callofduty.com, ESRB: M**

The Large Hadron Collider Award for Breaking Causality

Braid

Although Braid was originally released in 2008 on the Xbox 360, it was this year that PC gamers first got to experience Jonathan Blow's mind-bending, time-twisting masterpiece.

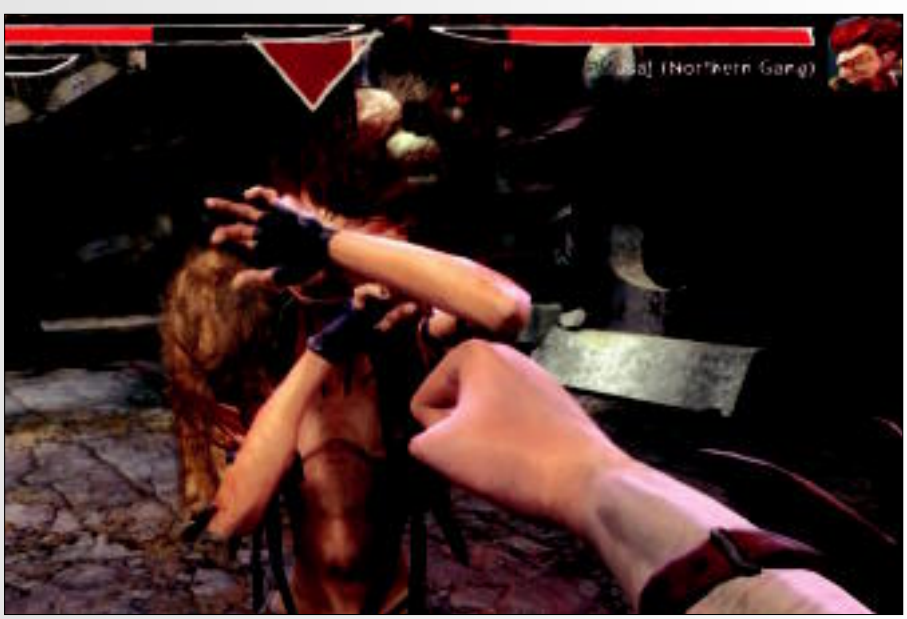
Braid is a puzzle game disguised as a platformer, where time-altering powers and lateral thinking are the only way to advance to the next level. If you like cerebral or indie games and somehow missed Braid, do yourself a favor and pick it up ASAP. **www.braid-game.com, ESRB: E10+**



Let's Get Punchy

Zeno Clash

Zeno Clash probably shouldn't have worked. A first-person puncher with surreal visuals, fish guns, squirrel bombs, and androgynous Father-Mother figures, made by a tiny independent studio from Chile shouldn't have been a hit. But the game's melee combat feels right, the loony art style is memorable, and the game is great fun. Some of the best moments come from the game's cutscenes, like those describing the creepy-crazy Corwids of the Free. **www.zenoclash.com, ESRB: RP (Rating Pending)**



400 Sq. Km of Real, Hard Emergent Gameplay

ARMA 2

ARMA 2 is a punishingly difficult war simulator that stresses your patience and tolerance for bugs. But once you figure out its myriad keyboard commands and accept the buggy AI, it's one of the most rewarding PC games of the past decade. Co-op missions let you embark on epic operations—a typical mission may involve airdropping a squad behind enemy lines, stealing jeeps to drive into a forest, and mounting a guerilla attack on a coastal fortification to destroy anti-aircraft batteries before calling a helicopter in for evacuation. **www.arma2.com, ESRB: M**

The 'Why the Hell Are You Playing This on the PC?' Award

Street Fighter 4

If you're a fan of fighting games, it's probably a pretty safe bet that you own a console; since Street Fighter 2 made the jump from arcade to living room in 1992, fighters on the PC have been few and far between. Thankfully, Capcom bucked that trend with Street Fighter 4. Sure, it was a little late, but with a handful of bonus features, and the same kick-ass, ass-kicking gameplay, Street Fighter IV is a must-buy for any fighter fans who didn't pick it up for a console. **www.streetfighter.com, ESRB: T**

Best Use of a Wooden Baseball Bat

Left 4 Dead 2

One of the biggest omissions of last year's Left 4 Dead was the lack of melee weapons, which any survivalist knows to be crucial to fighting the zombie horde. Fortunately, Left 4 Dead 2 let us swing away at zombie skulls with 10 melee weapons, including the sturdy maple barrel of a baseball bat. Swinging wide with the bat saved us countless times from being swarmed by the infected—we knew those years in pee-wee baseball would pay off! **http://l4d.com, ESRB: M**

Best DLC We Almost Couldn't Play

Fallout 3: Broken Steel

Fallout 3 was one of our favorite RPGs of 2008. And its five downloadable expansion packs added to the already massive story—the best of them, Broken Steel, raised the level cap from 20 to 30 and added hours of gameplay. But Fallout 3's DLC is tied to Games for Windows Live, and between several completely borked DLC releases and the hoops we had to jump through to re-enable the DLC if we ever reinstalled, we nearly missed them all. **http://fallout.bethsoft.com, ESRB: M**

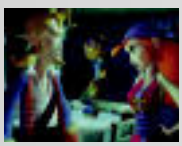
Worst Use of a Wooden Baseball Bat

Team Fortress 2 Scout Update

We hate Scouts. In Team Fortress 2, these bunny-hopping pixies bounce around maps like overactive children off their medication… and they're equipped with shotguns. It's beyond us, then, why Valve made the Scout even more annoying with The Sandman baseball bat. This unlockable weapon let the Scout stun us in our tracks, making us vulnerable to gunfire, and worse yet, taunts. We hate Scouts. **http://teamfortress.com, ESRB: M**

Best Resurrection of a Beloved Franchise

Tales of Monkey Island



After a decade of wandering the seven seas, pirate-wannabe Guybrush Threepwood returned to the realm of PC gaming in 2009. His new swashbuckling adventure captured the wry humor and clever puzzles of the original Monkey Island games, and included plenty of in-jokes for longtime fans. The return of the original voice cast and game designers also solidified the game as a legitimate sequel to the series. **www.telltalegames.com, ESRB: E 10+**

Click, Click, Click, Click, Click Award for Diablo-esque Gameplay

Torchlight

Over the years, we've played dozens of bad Diablo clones, but not until Torchlight have we found a game that so mercilessly captures the magical appeal of Diablo while still retaining its own unique voice. Torchlight does that perfectly, albeit without a multiplayer component. Still, exploring the dungeons beneath the town of Torchlight gave us nights of adventure and wonder that will help tide us over 'til Diablo III is out. **www.torchlightgame.com, ESRB: T**

Déjà Vu Award for Console Port Timeliness

Burnout Paradise

At 380 days, the lag from the console release of Burnout Paradise to the PC release of the game has to break some sort of record. Fortunately, the game is so unrelentingly awesome that we didn't care about the delay. Bringing the classic Burnout formula of fast cars, over-the-top damage models, and incredibly reckless driving to an open world with thousands of miles of in-game roads and hundreds of challenges to complete was well worth the wait. **www.criteriongames.com/burnout/paradise, ESRB: E10+**

Best Blizzard Ripoff

Dawn of War 2

Dear Game Workshop,

We appreciate that you've delivered us an awesome, action-packed strategy/RPG hybrid with Dawn of War 2, but could you be a little better about citing your sources? Everyone knows it was Blizzard that invented the Space Marines vs. Space Bugs vs. Space Elves setting, and it absolutely didn't rip off anyone else. At all.

Oh, and about Warhammer Online? Blizzard just called; it wants its Orcs back. **www.dawnofwar2.com, ESRB: M**

A Decade of Greatness

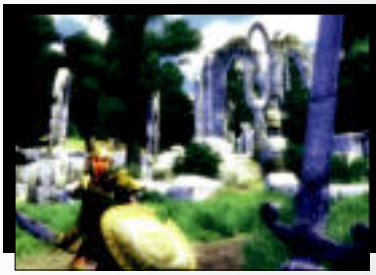
Our favorite games of the last 10 years (in no particular order)

HALF-LIFE 2

Just like its predecessor, once you've played Half-Life 2, it's the bar you hold up to every single-player game you play thereafter. Sure, continuing the story of Gordon Freeman in a world ravaged by years of Combine occupation was great, but the high points of Half-Life 2 were the stunning physics-based gameplay and the outstanding character models and animation. These elements advanced gameplay enough that Half-Life 2 earned the only 11/Kick Ass rating we've ever given. **www.half-life2.com, ESRB: M**

BATTLEFIELD 1942

Battlefield 1942 changed the world of gaming in 2002 and promoted us all from mere ground-pounding grunts to pilots, gunners, bombardiers, sailors, and tankers. No longer content to pull the trigger on an M-1 Garand, gamers were able to exploit a rich list of air, sea, and land vehicles in massive 64-player maps. That way, when your grandson asks you how you used to play games, you can say, "I didn't just shovel a mouse around a keyboard all day, I played Battlefield 1942." **http://games.ea.com/official/battlefield/1942/us/, ESRB: T**

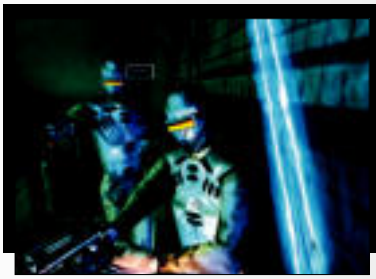


OBLIVION

Oblivion is the culmination of the venerable Elder Scrolls series of open-ended RPGs from Bethesda Softworks. And although previous games in the series have been excellent, it's Oblivion's combination of tight pacing, engaging combat, and exhilarating exploration that made it one of the best of the decade. Other efforts, like Fallout 3 and Dragon Age have come close, but for pure PC-RPG flavor, Oblivion is king. **www.elderscrolls.com, ESRB: M**

TEAM FORTRESS 2

Nestled snugly inside the Orange Box, a Valve Software superpack including Half-Life 2: Episode 2 and Portal, was a long-awaited gem: Team Fortress 2. By taking the class-based madness of Team Fortress Classic and paring down each and every class to its bare essentials, Valve made what's quite possibly the perfect multiplayer game—for newbie and hardcore players alike. But it didn't stop there. By constantly adding new content to the game, Valve's kept the game fresh for the last two and a half years. **www.teamfortress.com, ESRB: M**



DEUS EX

Deus Ex, released in summer '00, is only barely eligible for this list, but man, what a way to kick off the decade. Blending shooter, role-playing, and stealth elements, Deus Ex gave players choice in a way that has seldom been matched since. The first sequel to Deus Ex was a mess, but we've got high hopes that Deus Ex 3 will bring back the magic. Don't let us down again, Eidos. Please? **www.deusex.com, ESRB: M**

WHITE PAPER

USB 3.0: What's the Fuss?

It's fast and it has the potential to reshape the PC as we know it –LOYD CASE

Today, we're starting to see the first motherboards with USB 3.0 support. That support exists in the form of a discrete controller chip, typically the NEC uPD720200; it will likely be late 2010 or sometime in 2011 before we see USB 3.0 integrated into motherboard chipsets. Still, USB 3.0 is a major leap beyond USB 2.0, so peripheral manufacturers are already announcing products to support the new standard.

First, let's clarify some terminology. USB 1.0/1.1 was typically just called USB, and supported throughput up to 12Mb/s. When USB 2.0 arrived, with its 480Mb/s speed, the USB Working Group (www.usb.org) needed a distinguishing name, hence Hi-Speed USB. USB 3.0 will be called SuperSpeed USB. Got that?

WHERE OLD MEETS NEW

SuperSpeed USB supports maximum throughput of up to 5Gb/s—roughly 10x the speed of USB 2.0. However, USB 3.0 is fully backward compatible with USB 2.0, so you won't need to toss your old peripherals as SuperSpeed USB–capable motherboards and systems arrive on the scene.

USB 3.0 manages its backward compatibility with a dual-bus architecture, which operates concurrently with USB 2.0 signaling. It achieves this by adding pins to the USB connector. Note that USB 3.0 is a bidirectional architecture, whereas Hi-Speed USB is unidirectional.

The connector shell for the host system (that familiar flat connector) looks the same. If the host detects no USB 3.0 connections, it reverts to USB 2.0; otherwise it will run at full USB 3.0 speed.

The interface on the peripheral side—the taller, D-shaped connector—has grown a bit, gaining a slight bulge at the top. Now it looks a little like a skinnier version of the typical Ethernet connector. However, that connector will accept the old-style D-shell connector for USB 2.0 devices. Micro connectors—those pesky, tiny interfaces built into cameras, digital media players, and other smaller devices—are more problematic. The compatibility issue is solved by adding additional real estate to the connector itself, effectively turning it into a double-connector—one for USB 2.0 devices and one for USB 3.0 hardware.

There will be two types of micro connectors for USB 3.0, down from a seeming multitude of small connectors for USB 2.0.

When you start running at 5Gb/s, signaling integrity becomes paramount. So, USB 3.0 will move away from the unshielded twisted-pair cabling used for older USB versions, to shielded differential-pair cabling. This enables the cable lengths needed for useful peripheral interconnects while maintaining the signal integrity needed for SuperSpeed USB. Cable lengths up to three meters (10 feet) will be supported.

Unsurprisingly, the signaling itself is somewhat similar to PCI Express and Serial ATA, with two differential pairs. Typical USB hot-plug capability will still be supported—a must in the world of easily detachable devices.

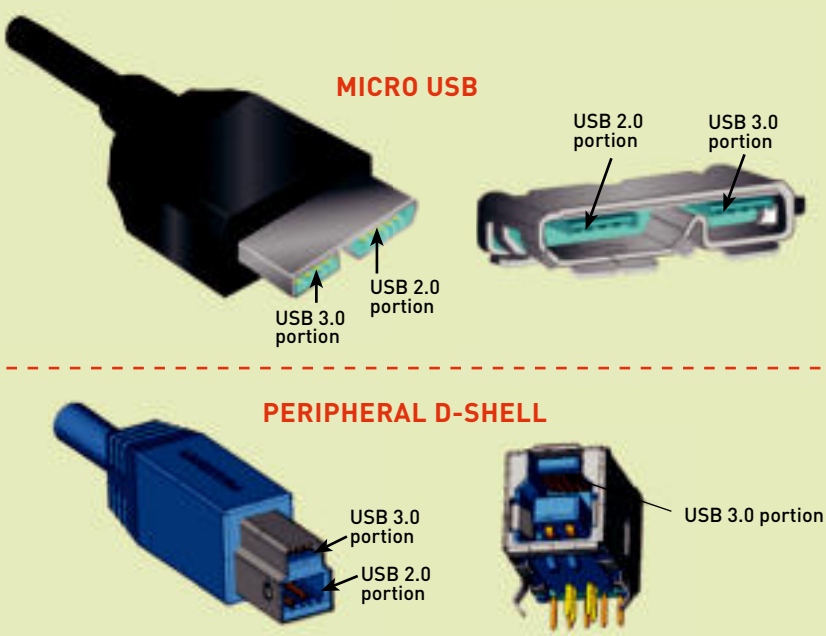
POWER MANAGEMENT

One feature that's going away is the need for polling, which will be replaced by a more interrupt-driven model in which the peripheral will ping the host system, which can then initiate a transfer request. The bus is only active when actually moving data. This improves overall power efficiency, so that battery life remains robust, even at the higher throughput.

In fact, SuperSpeed USB maintains power management at all levels, from the host, through hubs, and down the actual physical layers. There's no broadcasting of packets—they're only sent when requested. This is managed by asynchronous notifications as to when a device or host link is ready to receive or transmit data.

HOW IT WORKS

USB 3.0 Connectors



Engineering a connector that was both backward-compatible while enabling the higher speeds of USB 3.0 wasn't trivial. Additional pins for data needed to be added. In the case of micro USB connectors, a secondary shell was added as an extension to the original. The full-size connector looks the same on the PC side, with new pins, while the peripheral D-shell connector got a little taller—but it still accommodates USB 2.0 peripheral connections.

One of the key design parameters was that USB 3.0 links enter a low-power state whenever the bus is idle.

More sophisticated power management meant that hubs had to become smarter. Don't think of a USB 3.0 hub as just a way to add more ports. Hubs will need to monitor upstream and downstream packets to ensure that data is routed to the correct device. Data will need to be buffered until sleeping devices and ports are woken.

A key feature that facilitates power management is Latency Tolerant Messaging (LTM), which allows systems to go into deep sleep states while still maintaining active links to connected peripherals. It's likely that some peripherals will be more "tolerant" of message delays than others, so the device can actually notify the host system as to what its maximum latency tolerance will be.

One last key feature of note is power delivery. USB 3.0 is rated to deliver 900 milliamps per connection, almost double the current 500mA. That means devices that require higher power now won't require power bricks. Remember that external optical drive that needed two USB connections—one for supplemental power, one for data and power? That peripheral can now get both power and data off a single connection. More robust USB chargers are also possible.

A LOOK AHEAD

At 5Gb/s, USB 3.0 is faster than Serial ATA 3Gb/s and almost as fast as SATA 6Gb/s. That makes it plenty fast for external storage, including very fast SSDs. Latencies are likely to be a little higher, but not so much that it will make a difference. That might mean that eSATA's life is limited, since USB 3.0 will likely be more flexible and offer better power efficiency.

A single USB 3.0 connection will also be roughly the same speed as a single-lane PCI Express 2.0 connection. So external networking, audio, and high-definition video devices that operate in real time become possible. In fact, the first publicly announced USB 3.0 peripheral was the Point Grey USB 3.0 camera, capable of streaming full 1080p video in real time over a SuperSpeed USB connection.

At the same time, don't expect miracles. If you chain a bunch of devices to a single USB 3.0 port, overall throughput per device will naturally be reduced. Today, we're seeing systems with eight or 10 USB 2.0 ports; it wouldn't be surprising to see demand for ports increase in the future. USB 3.0 will also likely become the nail in the coffin of FireWire connections for PCs.

Of course, your usual peripherals will continue to work as expected. Keyboards, mice, card readers, and other USB 2.0 devices will still function. You'll get faster throughput, better power delivery and robust efficiency. It's no wonder that motherboard and peripheral manufacturers are jumping on the bandwagon.

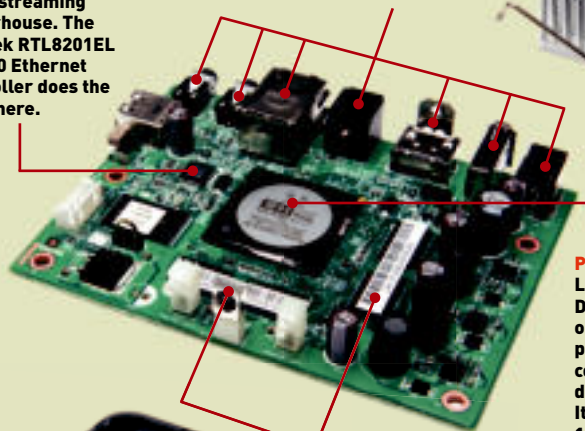
WD TV Live HD Media Player

The first WD TV player was a sneakernet device for playing music and movies and viewing photos on your TV from attached USB storage devices, like hard drives and flash drives. The WD TV Live—one of a spate of recent set-top streaming devices—ups the ante by adding an Ethernet port and DLNA/UPnP support, so you can stream 1080p video and other files from your computers/media servers. Let's take a closer look.

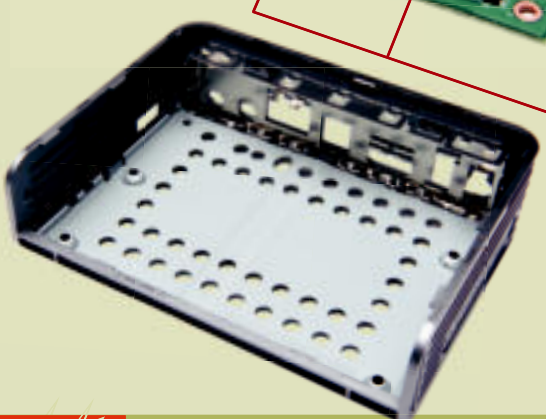
HEATSINK Every processor produces heat, so to keep the Sigma processor cool, the WD TV Live incorporates a solid-aluminum heatsink with 84 heat-dissipating fins.

ETHERNET CONTROLLER The real genius of the WD TV Live was adding the Ethernet port, turning a pretty decent set-top media player into a streaming powerhouse. The Realtek RTL8201EL 10/100 Ethernet controller does the work here.

PORTS The WD Live has ports aplenty. From left to right: proprietary component-video out, audio out, Ethernet, optical-audio out, HDMI, USB, power.



PROCESSOR The WD TV Live's brain is a Sigma Design SMP8655 system-on-chip, with a 500MHz processor, 333MHz coprocessor, and 333MHz digital signal processor. It supports Dolby TrueHD, 1080p, and more codecs and file formats than you can shake a stick at.



RAM The Sigma SMP8655 supports up to 1GB of RAM, but the WD TV Live uses 512MB, courtesy of four 1Gb (128MB) Nanya DDR2/667 DRAM modules.

SUBMIT YOUR IDEA Ever wonder what the inside of a power supply looks like? Don't take a chance on destroying your own rig; instead, let us do the dirty work. Tell us what we should crack open for a future autopsy by writing to comments@maximumpc.com.

HOW TO

Step-by-Step Guides to Improving Your PC

THIS MONTH

DOWNTIME BE DAMNED

NORMAN CHAN
ONLINE EDITOR

As much as we like to multitask, there's only so much a processor can handle at once. And some processes, like games, monopolize CPU clock cycles, making it inconvenient to run other processor-intensive utilities in the background. That's why I keep my home PC powered on while I'm at the office. Forget about energy savings—a powerful PC is meant to be utilized. Here are some tasks that are best run during the daytime.

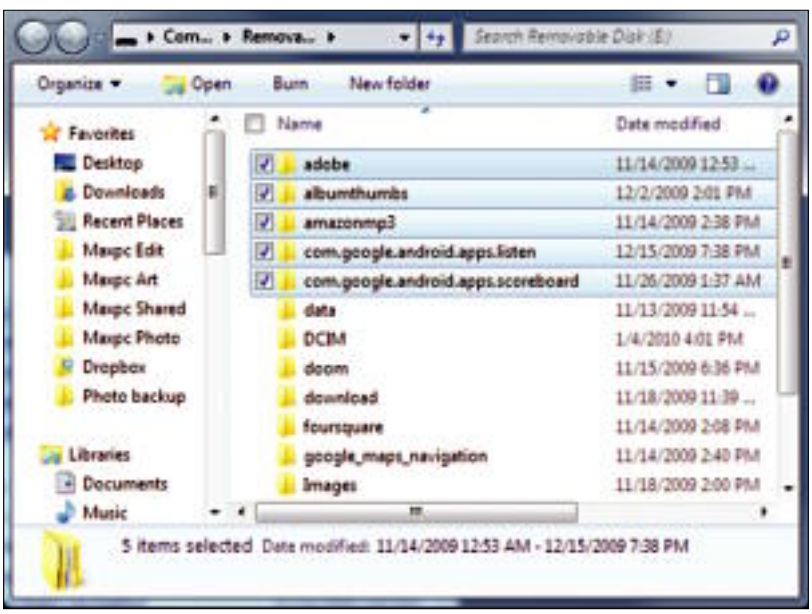
Distributed-computing projects let you donate your spare CPU cycles to worthwhile causes. Search for extraterrestrial intelligence with SETI@home or help doctors understand diseases with Folding@home.

The daytime is also a great window to schedule essential system backups, antivirus and malware scans, and hard drive defragmentation.

With hard drive space getting cheaper, I batch process high-definition video files into different resolutions and file formats. That way, I always have a version of a video that will play on any portable device or media streamer without real-time transcoding.

SUBMIT YOUR IDEA Have a great idea for a How To project? Tell us about it by writing to comments@maximumpc.com.

WINDOWS TIP OF THE MONTH



Enable Check Boxes

Holding the CTRL key lets you select multiple files in a folder window, but you can also use check boxes to make selecting multiple files a one-hand task in Windows Vista and 7. To enable check boxes, launch Folder Options from the Tools menu of any Explorer window. Go to the View tab and check the "Use check boxes to select items" setting.

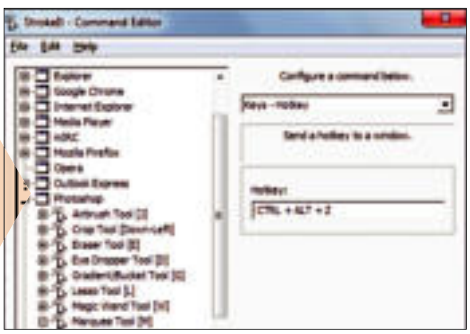
Add Mouse Gestures to Windows

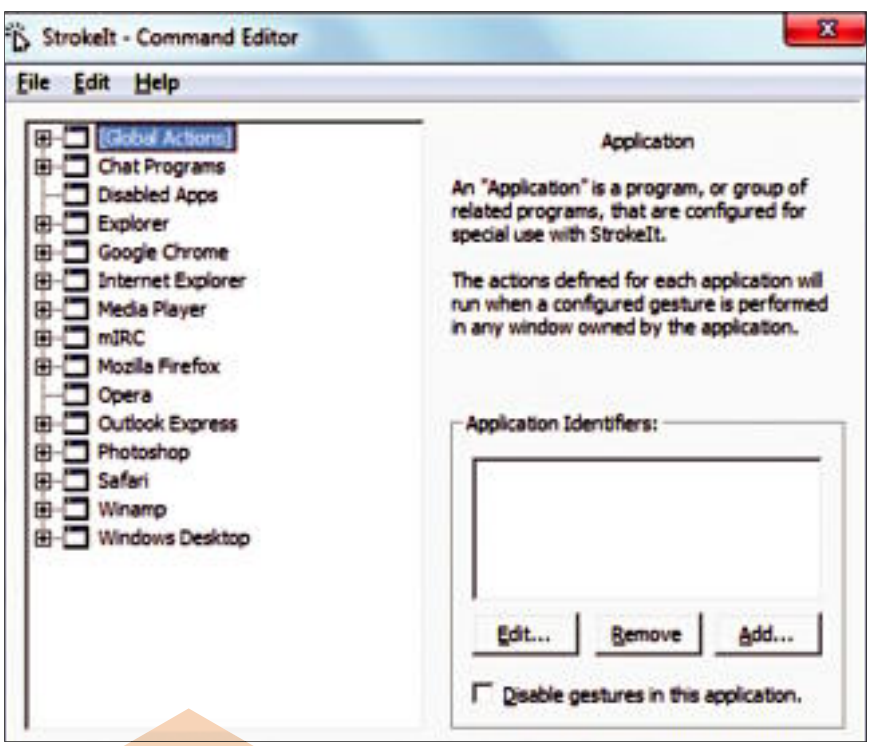
Remember browsing the web before mouse gestures? Neither do we. It's not because we can't recall that far back, we've just chosen to block out any recollection of wading through cyberspace using only the navigation toolbar. How primitive!

Mouse gestures have become such a popular part of day-to-day web surfing that it was only a matter of time before someone ported the functionality over to the Windows OS. Enter StrokeIt, a free, open-source utility that brings the magic of mouse gestures to any system running Windows 95 or later. We show you how to use StrokeIt (http://bit.ly/5k2dSN) to improve your productivity! –PAUL LILLY

TEACH STROKEIT NEW ACTIONS

In addition to the wealth of actions pre-configured in StrokeIt, you can also create your own. As an example, we will create an action for the Step Backward command in Photoshop. Left-click the StrokeIt icon and expand the Photoshop tree in the left-hand pane. Click File > New Action and name it Step Backward.





PERFORM PRESET GESTURES

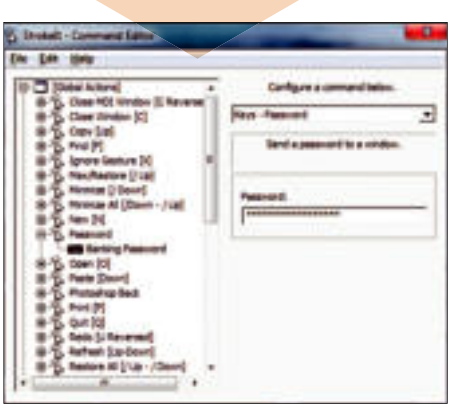
StrokeIt comes with more than 80 mouse gestures out of the box, most of which you're probably already familiar with from having used Firefox with FireGestures or any other similar add-on. StrokeIt's gestures are activated in the same manner—just hold down the right-mouse button and perform an action. To navigate left, for example, you would hold down the right-mouse button and drag your mouse to the left. To see the full list of available mouse gestures, left-click the StrokeIt icon in the taskbar.

With the action highlighted, select a gesture from the pull-down menu (we chose Left) and click the Add Gesture button. Now, right-click the action and select New Command. Select Keys - Hotkey from the Configure a Command pull-down menu. Finally, click the Hotkey field and press CTRL+ALT+Z. You've just configured a Step Backward gesture for use in Photoshop!

CREATE GESTURES FOR COMPLEX PASSWORDS

The best passwords consist of a random assortment of alphanumeric characters with both uppercase and lowercase letters. The only problem is that the stronger the password, the harder it is to remember. That's where StrokeIt can help.

Open StrokeIt and expand the Global Actions tree. Create a new action and name it Password. In the right-hand pane, select Reverse P or any other gesture from the Gestures pull-down menu and click Add Gesture. Now right-click the new action and click New Command, or press CTRL+N. If you want, give the command a descriptive name, like Banking Password. Highlight the command and select Keys - Password from the Configuration pull-down menu in the right-hand pane, and then enter a strong password. From now on you can use your new gesture rather than manually typing in your super-secure password!



Create Powerful Windows Shortcuts

Think about all the time you spend in front on your PC. Are you being efficient? Here's a better question: Are you being as efficient as you can be? The simple answer is no. Every time you lift your fingers off of your keyboard to navigate Windows, you're wasting time. Sure, it only takes a few seconds to drag your mouse cursor over to the Firefox icon or to navigate the Start menu to open up the Control Panel, and while none of that sounds like a big deal, it all adds up over time, be it a week, a month, or a year. The reason Microsoft includes so many shortcuts in Windows is so you can streamline these little time-wasters, but these preset hotkeys will only take you so far.

That's where AutoHotkey comes in. It's a lightweight but powerful app that allows you to create keyboard shortcuts for any Windows program. Here are a few tricks to get you started. –PAUL LILLY

INSTALLATION AND SETUP

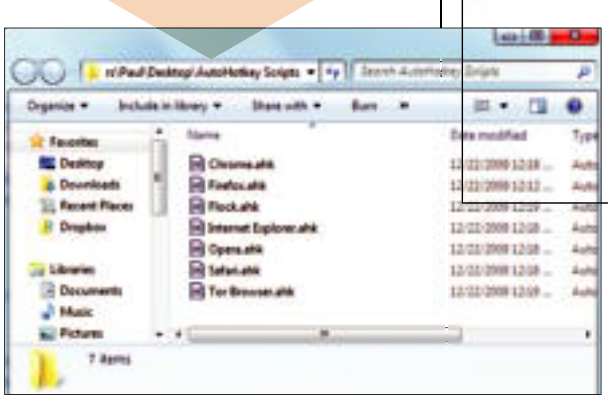
First, download AutoHotkey from www.autohotkey.com. There's not much to the initial installation, so go ahead and leave the default options alone. When you fire up the program for the first time, you're given the option of creating a sample script in the My Documents folder. This isn't necessary, but it is a good way to familiarize yourself with the basic instructions. In short, the way AutoHotkey works is by creating scripts, which consist of a plain text file containing commands that AutoHotkey.exe will execute.

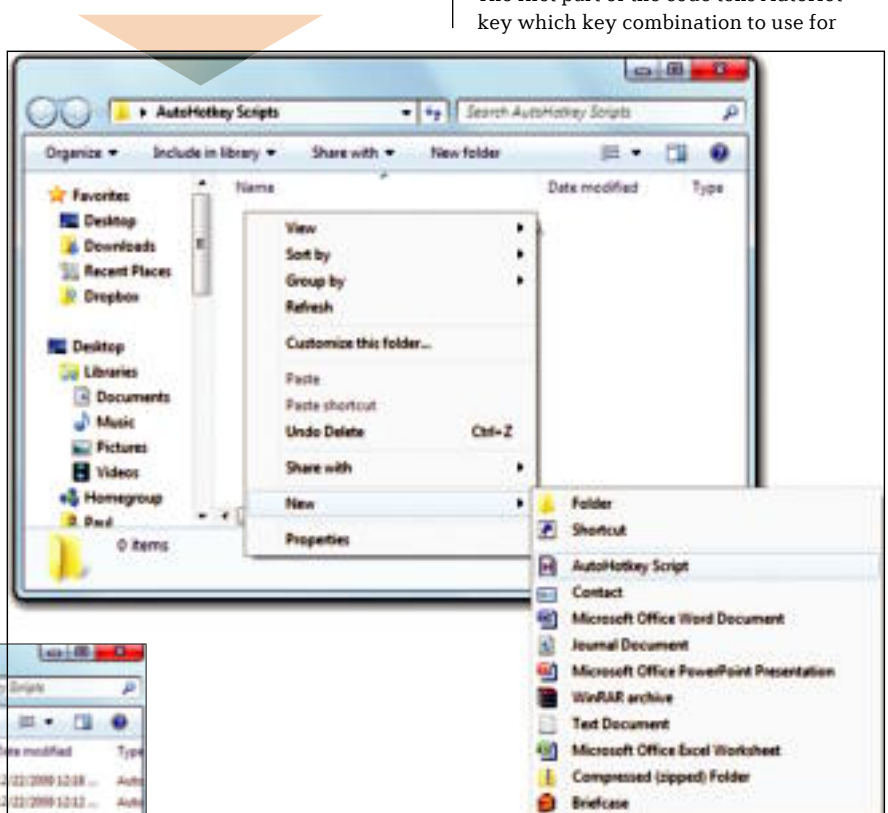
Once installed, create a folder called AutoHotkey Scripts on your Desktop or any other place where you want to store your scripts. If you don't want to clutter your desktop, creating the folder on the root of your C:\ drive will keep the folder out of sight, but still easy to find.

AUTO-LAUNCH FIREFOX

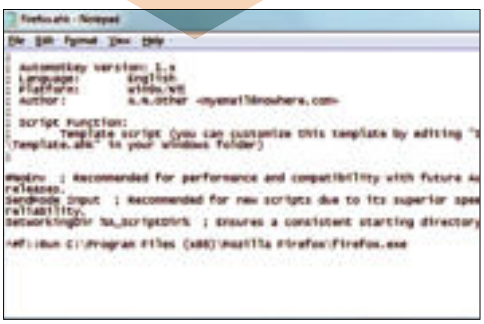
We're going to create a script that allows us to quickly call up Mozilla's Firefox browser without ever taking our hands off the keyboard. Keep in mind that while we're focusing on Firefox in this example, you can adjust the code for any program you want.

Open up the scripts folder you just created, right-click anywhere in the empty space, and select New. One of the options in the context menu should now read AutoHotkey Script—select that option. Name the script Firefox and then right-click it and select Edit Script.





key script. For this one, all you have to do is type ^#f::Run C:\Program Files (x86)\Mozilla Firefox\firefox.exe



Confused? Let's break this down. The first part of the code tells AutoHotkey which key combination to use for the shortcut. That's followed by the Run command, and finally the location of the program we want to run. In this case, we just coded a script to open up Firefox when pressing Control (^), Windows Key (#), and the f key.

Scripting languages can be complicated, but fortunately, you don't need to be a programming guru to make a simple AutoHot-

You can change the key combination to whatever you want. When you're finished, save your work, close the Window, and then double-click the .ahk file you just edited (Firefox.ahk, in our example). Now the script is loaded and ready to use!

TRANSFORM SHORTHAND INTO LONGHAND WITH HOTSTRINGS

In addition to hotkeys, AutoHotkey also makes use of hotstrings, which are shortcuts that allow you to bind keystrokes to words or phrases. This comes in especially handy when composing emails, whether it's typing out an email address or converting your text-speak shortcuts into legible English.

Create and edit a new script as previously outlined. We're going to enclose our shorthand text between pairs of colons followed by the unabbreviated text we want to replace it with. For example, to create a two-letter abbreviation for "To Whom It May Concern" using the letters tw, we would type ::tw::To Whom It May Concern into the script file. This trick also comes in handy for email addresses. Create as many abbreviations as you need (use a new line for each), save and exit, and then double-click the .ahk file as before. Your abbreviations will be replaced automatically with the designated text whenever you hit the key combinations (in this case, tw) followed by a space, period, or enter.

CREATE YOUR OWN MEDIA CONTROLS

Don't fret if your keyboard doesn't include multimedia controls, because with AutoHotkey, it's really easy to create your own. Here's an example of a script for controlling all facets of multimedia playback using the CTRL+Shift combination:

- ^+m::Send {Volume_Mute}
- ^+.::Send {Volume_Up}
- ^+,::Send {Volume_Down}
- ^+n::Send {Media_Next}
- ^+b::Send {Media_Prev}
- ^+o::Send {Media_Stop}
- ^+p::Send {Media__Play_Pause}

The coolest part about this is that the above controls work with any media player software, be it Windows Media Player, WinAmp, or even Napster.

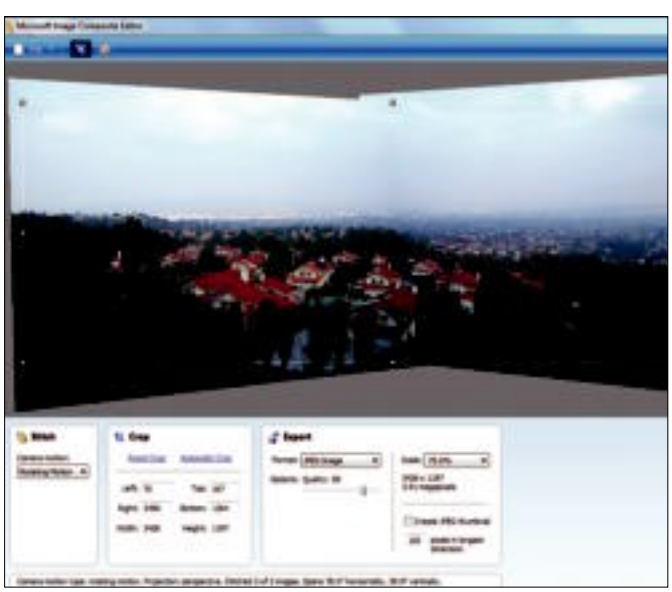
TAKE YOUR SCRIPTS WITH YOU

It isn't necessary to install AutoHotkey on every PC you come in contact with. Instead, right-click any script you want to make portable and select the Compile Script option. AutoHotkey will spit out a related executable that can be run on any Windows-based PC!

Stitch Panoramic Photos

There are some locales that simply can't be captured in a standard 5x7-inch photograph. Take the Grand Canyon, for instance. The canyon measures 277 miles long and up to 18 miles wide. To replicate the ultra-wide field of vision in digital photography, you'll need to use a technique called panoramic photography. One way to do this is by investing in an expensive DSLR camera and a fisheye lens designed specifically for capturing wide-stretching scenes. But we'll show you the quickest way to create the same effect with a $50 point-and-shoot.

–PAUL LILLY



WHAT YOU NEED

- **Digital camera**
- **Tripod (optional, but recommended)**
- **Microsoft's Image Composite Editor** (free, http://bit.ly/4wffUI)

1 KEEP IT LEVEL

Before we can create a panoramic photo, we need at least two photos of the area we're trying to capture. Later on we'll use Microsoft's Image Composite Editor to "stitch" our snapshots together, and the result will depend largely on this first step.

If you don't own a tripod, we recommend you get one. You don't need anything fancy or expensive,

just something to keep your camera steady. A basic tripod shouldn't run any more than $25-$30, but if you just can't scrounge up the cash, try to find a tree or other steady object to lean against when taking your photos.

2 START AT THE LEFT

There are different techniques for taking panoramic shots, but we recommend starting from the left and working your way to the right. Snap your first photo and try to identify an object or point of interest on the right-hand side. Use this object or area to position your camera for the next shot, placing it in the middle. Pay careful attention that you're not moving the camera too far up or down as you adjust it horizontally, especially if you're not using a tripod. Once positioned, snap your second shot and reposition one more time to capture the right side of the scene. If the landscape is longer, however, feel free to take more than just three photos.

3 STITCH!

It really doesn't get any easier than Microsoft's Image Composite Editor (ICE). After you install and load the program, select the photos on your hard drive or camera's memory card and drag-and-drop them into ICE's main window. ICE will do the dirty work for you and automatically stitch the images together. When it's finished, you'll see a picture preview, and it will probably be a little bit distorted, more so if you had a hard time keeping the camera steady. Play around with the Camera Motion pull-down menu if you don't like the base result, though we've had good luck keeping it set to Automatic.

You'll notice eight points positioned in a rectangle around the preview image. Drag these to resize the rectangle to where you want to crop the image, and once you're happy with the result, press the Export button to save the cropped panoramic.

Play MKV and WMV Video Files on Mobile Devices

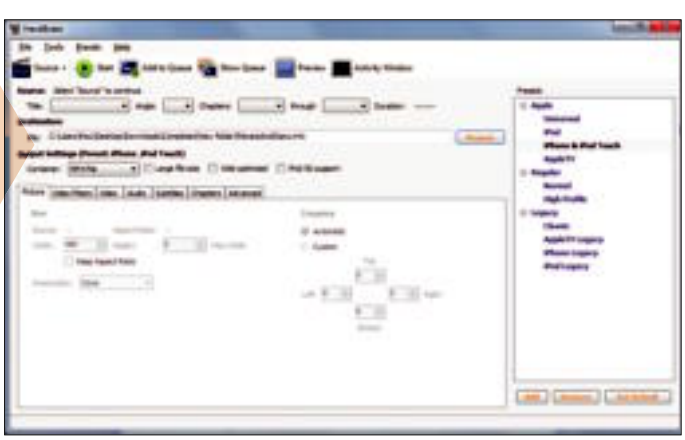
After video files have been compressed and processed by codecs (such as H.264), they are stored in container formats, such as Apple's QuickTime M4V. One container format that has been gaining popularity is Matroska Video, or MKV. The Matroska Multimedia Container is a license-free container format capable of holding an unlimited number of video, audio, picture, or subtitle tracks inside a single file. But while that robustness certainly has its advantages for desktop playback, MKV files aren't recognized by iPhone, iPod touch, or Zune HD players.

But don't go throwing your media player out with yesterday's garbage. We show you how to convert an MKV file into an MPEG-4 video file that most portable devices will be able to play without a hitch. –PAUL LILLY

CONVERTING MKV FILES

Download and install the latest version of HandBrake (http://bit.ly/5S9L2h). This free, open-source transcoding utility works on all varieties of Windows from XP on up to Windows 7, and also boasts support for Linux. It's incredibly easy to use, too. When you open HandBrake, you'll notice a Presets column on the right-hand side. If you own an iPhone or iPod, go ahead and select it and the necessary settings will be filled in. You can also use this setting for your Zune, or select the High Profile preset to select a custom video resolution.

To begin transcoding, click the Source > Video File and locate and open the MKV file you want to convert. Next, mash the Browse button in the main window to select an output location. Make sure the Container pull-down menu is set to MP4 File and press the Start button. Depending on the video length and the speed of your PC, the actual transcoding can take anywhere from a few short minutes to several hours. But once



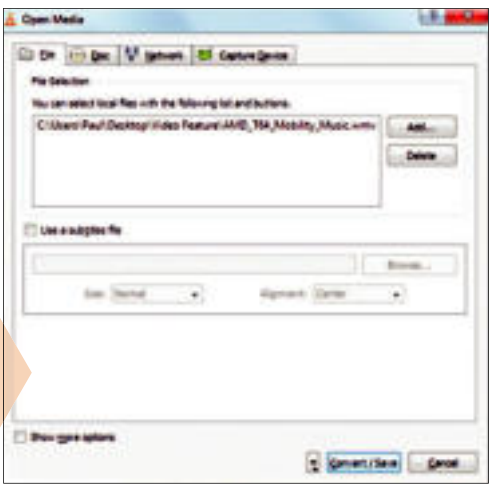
it's finished, you'll be in possession of an MPEG-4 video file playable on just about any portable media player.

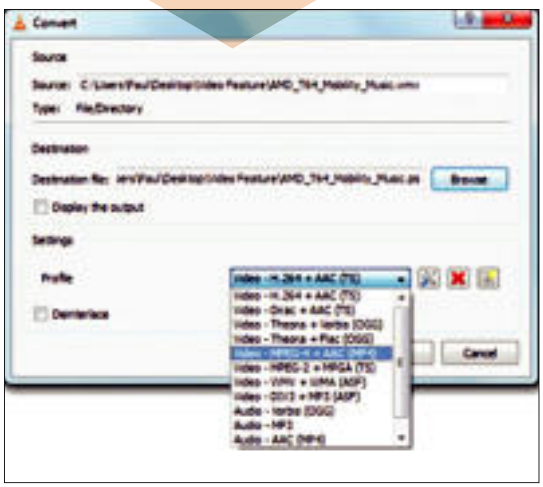
CONVERTING WMV FILES

Microsoft's Windows Media Video (WMV) format works well with Zune, but doesn't play on Apple devices. There are a few different ways you can convert a WMV file into a more manageable MP4 file. You can follow our previous instructions for using HandBrake (if you have the proper codecs installed), or you can use the built-in conversion tool in the popular VLC Media Player (www.videolan.org).

First, open the WMV file you want to convert in VLC. Next, click the Convert/Save... button or press CTRL+R. In the pop-up window that appears, click the Add button and select the WMV video. Once you've selected the video, press the Convert/Save button.

In the next pop-up window that appears, press the Browse button to select a new destination and input a file name. Be sure to give your new file the proper extension, which in this case would be .mp4. If you don't do this, you'll end up with the .ps file extension by default. In the Profile pull-down menu, select MPEG-4 + AAC (MP4) and click Save. If you receive an error message, you'll need to back up a step and in the first pop-up window, click the Capture Device tab and change the Capture mode to Desktop.





REVIEW

Tested. Reviewed. Verdictized.

INSIDE

ONLINE

- EVEN MORE REVIEWS!
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HP TouchSmart 600-1055

Now with fins!

The TouchSmart 600 includes an HDMI input, so you can plug in your gaming console of choice and make dual use of the high-def display.

Evaluating successive generations of HP's TouchSmart series reminds us of shopping for a new car. If you fall in love and buy this year's model, you must never, ever visit the showroom to look at next year's model or you'll be hit with a bout of buyer's remorse faster than you can say "planned obsolescence."

We're not suggesting that HP is intentionally designing these machines to have a shorter-than-normal useful life or that it's been adding frivolous features to new models; it's just that the company's engineers keep making design improvements that are significant enough for us to wonder why we heaped such praise on the previous iteration. The changes this year are a wee bit more incremental, but HP gets a major assist from Microsoft in the form of Windows 7, which is not only vastly superior to Vista but also offers far better native support for HP's touch applications. Fortunately, owners of previous-generation TouchSmarts have the option of upgrading to Windows 7 and downloading the latest version of HP's software.

But let's get back to the matter at hand: Just what makes the TouchSmart 600-1055 so damned sweet? There's the display, for starters. Last year's model had a 22-inch display with a native resolution of 1680x1050; this one has a 23-inch screen with a native resolution of 1920x1080, making it the perfect partner for both the slot-feed Blu-ray drive and the integrated HDTV tuner.

As has become typical of the TouchSmart series, HP builds the rest of the machine using a lot of notebook components to keep everything thin enough to mount on the wall and cool enough to minimize the need for noisy fans. And this machine is whisper quiet—we had to put our ear right over the top vent to hear the fan, and its signature was barely audible over the sound of the air it was inhaling through the grill. Getting back to HP's component choices, the designers mounted Nvidia's GeForce GT 230M in a PCI Express x16 MXM module and paired it with a dedicated 1GB frame buffer. The CPU is a mobile 2.13GHz Intel Core 2 Duo P7450 paired with 4GB of DDR3/1,333MHz memory (no doubt we'll see an Arrandale quad-core in next year's machine. Sigh.)

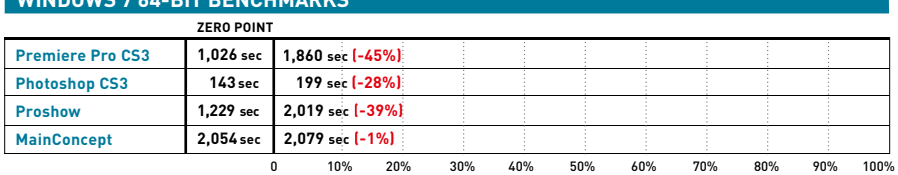
We had refrained from benchmarking all-in-one machines until Dell sent us its XPS One 24 (May 2009), which came with an Intel Core 2 Quad Q8200 desktop CPU; so it's only fair that we benchmark HP's offering, too. (We still don't run our gaming benchmarks on all-in-ones, though, since this class of machine clearly is not designed for gaming.) As you might expect, the Touch-Smart suffers in comparison to the Dell and to our previous zero-point rig, with benchmark results roughly 35 percent slower. But when we went online to get the XPS One 24's current price, we discovered that the product had disappeared from Dell's website.

HP's own TouchSmart applications are vastly improved over the two previous generations, and now there are third-party apps, too. The integrated Netflix, Pandora, Rhapsody, and Hulu clients are the most important of these, and there's also a touch-optimized custom browser. You'll still find yourself dropping out of the TouchSmart interface to use programs such as Word and Photoshop, but HP's software is much less of a novelty than it used to be. And we'll repeat our caveat about all-in-ones: This machine makes a great *second* computer; don't expect it to be your one and only. —MICHAEL BROWN

SPECIFICATIONS

Processor	Intel Core 2 Duo P7450 (2.13GHz)
Mobo	HP Proprietary
RAM	4GB DDR3/1333 (two 2GB sticks)
Videocard	Nvidia GeForce GT 230 (1GB dedicated memory)
Integrated TV tuner	AVerMedia A323 MiniCard Hybrid ATSC
Sound	Realtek HD Audio
Storage	750GB 7,200rpm SATA 3Gb/s
Optical	Slot-feed Blu-ray/Super-multi DVD burner

WINDOWS 7 64-BIT BENCHMARKS



Our desktop test bed consists of a quad-core 2.66GHz Intel Core 2 Quad Q6700, 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard. We are running two EVGA GeForce 8800 GTX cards in SLI mode, a Western Digital 150GB Raptor and 500GB Caviar hard drive, an LG GGC-H20L optical drive, a Sound Blaster X-Fi, and a PC Power and Cooling Silencer 750 Quad. OS is Windows 7 Home Premium 64-bit.

VERDICT 8

HP TOUCHSMART 600-1055

FIVE ON THE FLOOR	TIPTRONIC
Blu-ray drive; HDMI input; improved touch-screen UI; touch-optimized third-party apps.	Weak benchmark performance; integrated audio amp needs more power.

$1,650, www.hp.com

HIS Radeon HD 5970

If your system has muscle, this card will flex it

There's no doubt in our minds that the HIS Radeon HD 5970 offers superlative performance and extremely high frame rates. The combination of dual AMD Cypress GPUs, each coupled with its own dedicated 1GB pool of fast GDDR5 memory, makes this graphics card one of the fastest we've ever tested.

This particular card is based on AMD's reference design, so the two GPUs clock in at 725MHz, while the memory clock is set at 1GHz. It's an enormous card, too, at just over 12 inches long. If you buy the card from Newegg, you get a compact PC toolkit, though HIS is looking to expand the toolkit bundle. Also included is a coupon for a free Steam download of Dirt 2, the DirectX 11–capable racing game from Codemasters.

Assuming HIS built the cards to AMD specs, there should be plenty of headroom for overclocking. The beefy cooling system, with its full-length vapor chamber, can dissipate up to 400W of power. Of course, for best results, you'll want to tweak the card's voltage. AMD initially offered its own tool for overvolting GPU and memory, but has since withdrawn the utility. However, MSI's Afterburner tool (http://event.msi.com/vga/afterburner), which apparently works with any AMD-based graphics card, allows you to tweak the core voltage but doesn't provide a way to alter memory voltage.

We put the HIS Radeon HD 5970 up against AMD's last-gen dualie, the Radeon HD 4870 X2, Nvidia's dual GeForce GTX 295, and the two fastest single cards from both vendors. As was the case last month, when we reviewed XFX's HD 5970, HIS's HD 5970 blew the doors off any other graphics card currently available. But at $600, you should ask yourself if you really need such a massive, heat-generating monster of a graphics card.

The HIS Radeon HD 5970 is best experienced on big or multiple displays.

There's no question that if you're running on a 1920x1200 or 2560x1600 display, the huge pixel-pushing power of the HIS HD 5970 makes a difference. Do owners of more modest systems and displays need one—or can they even make use of that much GPU horsepower? The current generation of moderately priced LCD displays typically offer native resolutions of 1680x1050 (20- or 22-inch displays) or 1920x1080 pixels (23-inch and larger units.)

To answer this, we ran our suite of game tests on the HIS Radeon HD 5970, HIS Radeon HD 5870, and the XFX Radeon HD 5850 cards at different resolutions. To simplify the results, we took the geometric mean of all our tests at the different resolutions. With a 22-inch 1680x1050 panel, even the $300 Radeon HD 5850 will average above 62fps. At 1920x1080, that 5850 remains above 62fps. By moving to the Radeon HD 5870, you can average 76fps at 1920x1080 and 74fps at 1920x1200. The 5970 at 1920x1200 puts you in the 92fps range, and on a 30-inch 2560x1600 panel, you're still running at 70fps. The bottom line: If you're not running a big display, the HD 5970 is pretty much wasted. In fact, at the 1680x1050 resolution of most 22-inch monitors, you'll still average higher than 60fps with all the graphics goodness turned up (but no AA or AF) with even the $300 Radeon HD 5850.

There's no question that the HIS Radeon HD 5970 is an awesome piece of kit, but you really need an awesome system and display to take advantage of it. If you're system isn't riding the bleeding edge, you might opt for a lesser card. You'll save money and watts and still get great performance. On the other hand, if you've got a 30-inch monitor and the badass PC to drive it, you can't do better today than this card. —LOYD CASE

BENCHMARKS

	XFX Radeon HD 5970	GeForce GTX 295	XFX 5870	EVGA 285 GTX SSC	Radeon HD 4870 X2
3DMark Vantage Performance	**21,202**	19,342	17,089	13,941	14,458
3DMark Vantage Extreme	**12,537**	9,241	8,312	6,276	6,574
Hawx (fps)	**102**	93	68	62	78
Far Cry 2 / Action (fps)	**76**	62	62	47	67
Far Cry 2 / Ranch Long (fps)	**113**	73	74	56	77
Battle Forge / DX10 (fps)	**60**	33	47	46	36
Crysis / DX10 (fps)	**44**	29	32	22	33
Resident Evil 5 (fps)	**131**	115	100	87	126
X3: Terran Conflict (fps)	**106**	100	101	93	101
STALKER: Clear Skies (fps)	**52**	40	36	27	38

Best scores are bolded. Our test bed consists of an X58 chipset motherboard, an Intel 3.3GHz Core i7-975 Extreme Edition, 6GB of DDR3, and Windows 7 Ultimate in 64-bit. All games were run at 1920x1200 with 4x AA.

MAXIMUM PC KICK ASS!

VERDICT 9

HIS RADEON HD 5970

+ PEDAL TO METAL	− FLAT TIRE
Incredible gaming performance; very low idle power usage; toolkit and game bundle.	So big, you need a huge case to handle it; expensive; lower-res displays may not benefit.

$600, www.hisdigital.com/us

Thermaltake SpinQ VT

Too bad looks aren't everything

Thermaltake's first SpinQ cooler (reviewed February 2009) had style for sure—it looked like a blue-lit stack of bike gears with a fan in the middle, mounted sideways. The SpinQ VT adopts the same basic formfactor—the stack of circular aluminum fins mounted around an 8cm fan—but stands the stack upright, and uses red LEDs instead of blue. Other than that, it's more of the same—from the variable fan speed to the so-so performance.

The SpinQ VT (we still want to pronounce it "spink") stands 6.2 inches from base to top, and the fin stack is 4.7 inches in diameter. Six heat pipes lead up from the base into the 50 aluminum fins, and the 8cm fan blows cool air down over the fins. The fan uses a 3-pin connector and includes a variable-speed knob to take it between 1,000 and 1,600rpm, but since adjusting it requires you to reach into the case, we imagine most people will set it once and never adjust it again.

The SpinQ VT's performance is strictly middle-of-the-road, like its predecessor's. Eschewing the skyscraper configuration—which we've seen on all the best air coolers over the past year—gives coolers like the SpinQ gains in style, but not much else. In our test system, the SpinQ lowered idle CPU temperatures just 1.5 C below the stock cooler, while at 100 percent burn the SpinQ's temps were 11.5 C cooler than stock. Not shabby, but certainly no match for skyscraper coolers like Thermalright's Ultra-120 E or our champion Cooler Master Hyper 212+, which dropped burn temps by 19 C from stock.

The SpinQ uses the same plastic mounting clips as its predecessor and the stock Intel coolers, which makes installation easy. It's also pretty cool-looking. But its great looks don't translate into great performance, and it requires more than six inches of vertical clearance. Plus, its fan orientation might play havoc with your case's airflow, especially if you don't have an intake fan or vent in your side panel.

For $60, you can get a much better air cooler—or even two. —NATHAN EDWARDS

BENCHMARKS

	Thermaltake SpinQ VT	CoolerMaster Hyper 212+	Stock Cooler
Idle (C)	32.5	**30.25**	33.75
100% Burn (C)	52.5	**45.0**	64.0

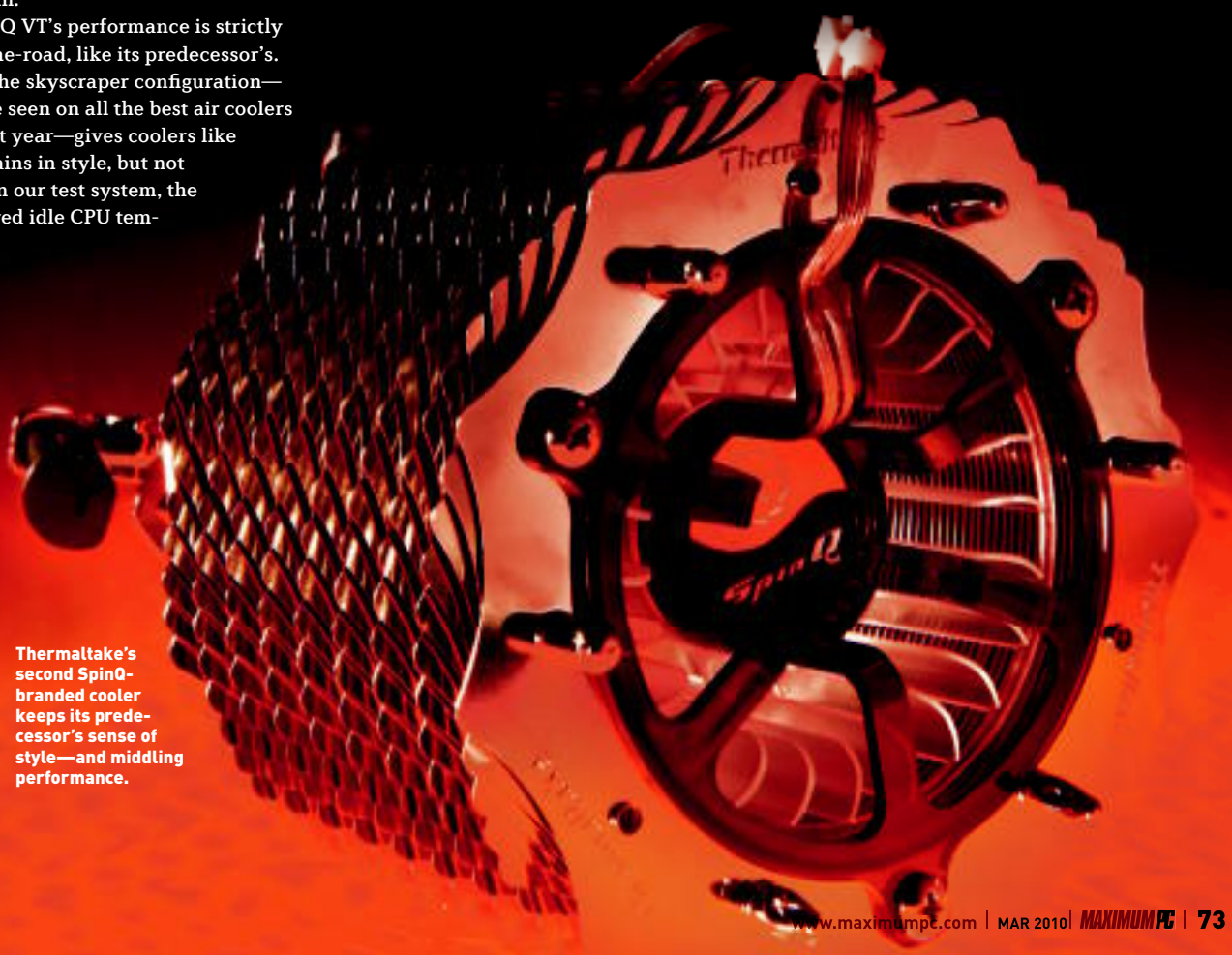
Best scores are bolded. Idle temperatures were measured after an hour of inactivity; load temperatures were measured after an hour's-worth of CPU Burn-In (four instances). Test system consists of a stock-clock Q6700 processor on an EVGA 680i motherboard inside a Corsair 800D case with stock fans.

VERDICT 7

THERMALTAKE SPINQ VT

+ SLINKY	- SKINK
Cool design; easy install; variable fan.	No 4-pin connector; middling performance; fan control inside case.

$60, www.thermaltakeusa.com



Thermaltake's second SpinQ-branded cooler keeps its predecessor's sense of style—and middling performance.

Asus Maximus III Formula

It's all about the pieces of flair

In a world where you can get a pretty decent $99.99 motherboard, a lot of consumers don't understand why you would pay one-and-a-half times more for a board using the same chipset.

That's because those same consumers don't seem to understand the attitude and atmosphere you get with a high-end motherboard. It's about the flair, and the Asus Maximus III Formula offers that in spades.

While some of the flair is extraneous, such as the garish case sticker, some can be truly handy. A set of stickers lets you label your SATA cables, for example. And then there's the flair that we've come to expect of Asus: the ever-useful Q-connector for front-panel connections and the no-snag I/O shield and snag-free RAM slots we first saw on the P7P55D Deluxe. Audio is upgraded over baseline boards with the SupremeFX X-Fi module. The module and drivers give you X-Fi algorithms and the codecs are moved off the noisy motherboard. Since RAM configuration can affect system reliability, the board also includes a handy BIOS-based MemPerfect utility to validate your RAM settings.

Asus takes remote-control monitoring and overclocking to the next level with the MIIIF, too. You can now connect a laptop directly to the motherboard to monitor voltages, temperature, and fans; read POST codes; and even overclock the board. It's neat, but we wish Asus would build in logging and graphing capabilities, as well.

We found no flaws in the board's physical layout, although the SATA ports are interesting. Six ports face forward while another two pairs in two different spots face up. Fortunately, all the ports are accessible even if the board is running in CrossFire X or SLI mode. Why two locations? Asus actually integrates two additional SATA controllers: one for the board's built-in fussless RAID configuration and the second one strictly to control two optical drives.

The board's performance was quite good. For the most part, P55-board performance has been consistent among board models, with most of the variation arising from the unpredictable nature of the CPU's Turbo Boost mode, which kicks up clocks based on load, power consumption, and temperature.

In the auto-overclocking department, Asus gives you multiple methods to overclock, but as with the Asus P7P55D Deluxe, we found the board overclocks best from the BIOS rather than using the Turbo V app. We took our Core i7-870 from a stock clock of 2.93GHz to a very stable 3.7GHz, with very little tweaking.

So, where does this put the Maximus III Formula? In the plus column, it offers performance equal to our current favorite, Gigabyte's GA-P55-UD6. The Gigabyte board has legacy floppy and PATA ports, though, and more flexible DIMM arrangements; but the MIIIF has the better audio subsystem and the nifty memory-validation tool, as well as the cool, but probably not very mainstream, remote-control capabilities.

Needless to say, it's pretty damned close. But if you put a phaser to our heads and made us pick, we'd go with the Maximus III Formula, as we're suckers for Creative audio and we think the MemPerfect feature could eliminate a lot of headaches in configuring RAM. —GORDON MAH UNG

BENCHMARKS

	Intel DP55KG	Asus Maximus III Formula
PCMark Vantage 64-bit Overall	7,130	7,080
Everest Ultimate MEM Read (MB/s)	**15,691**	13,538
Everest Ultimate MEM Write (MB/s)	10,839	10,864
Everest Ultimate MEM Copy (MB/s)	**14,925**	14,893
Everest Ultimate MEM Latency (ns)	50.3	**52.7**
SiSoft Sandra RAM Bandwidth (GB/s)	16.6	**17**
3DMark Vantage Overall	14,918	15,002
3DMark Vantage GPU	12,172	12,234
3DMark Vantage CPU	46,138	**46,732**
Valve Particle test (fps)	152	**161**
Crysis CPU (fps)	130	**152.3**
Resident Evil 5 (fps)	**147.5**	117.1
World in Conflict (fps)	189	**230**

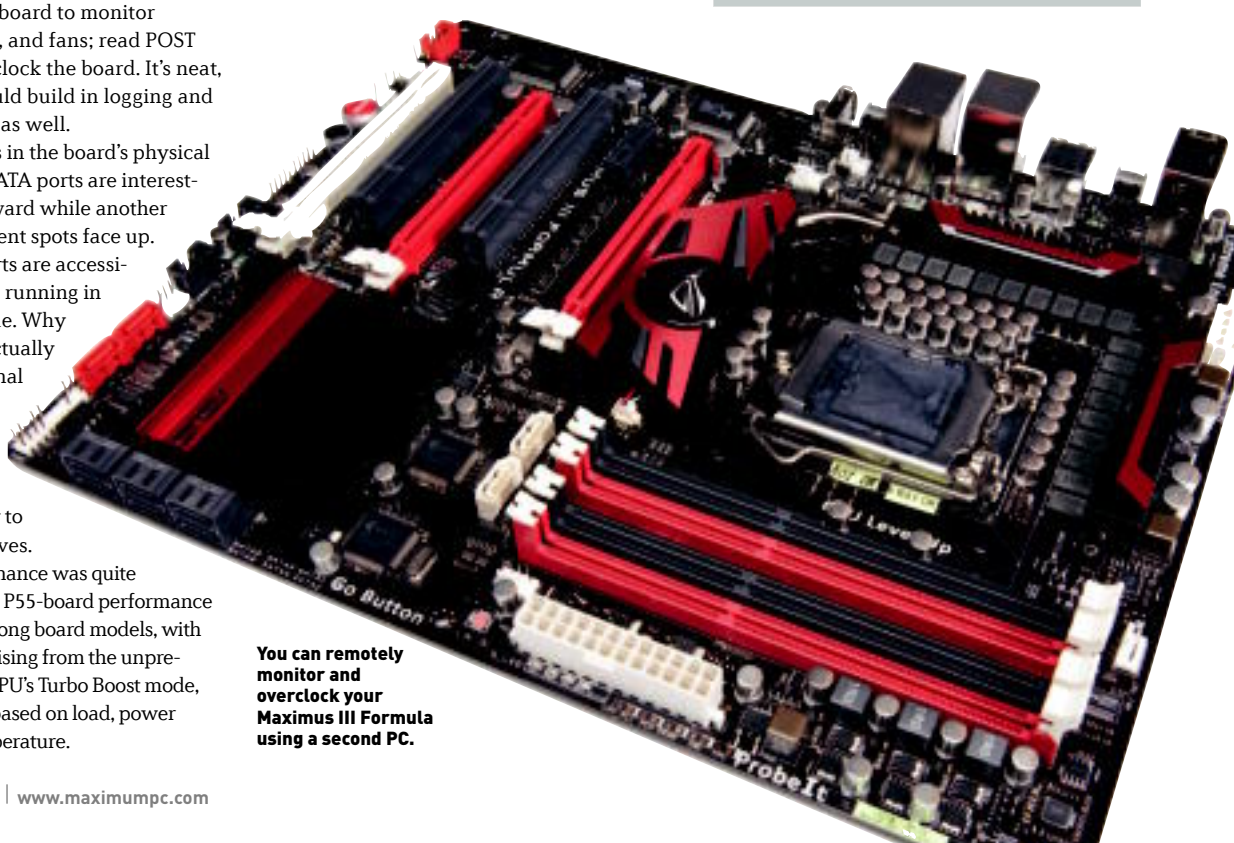
Best scores are bolded. We tested both motherboards using a Core i7-870, 4GB of DDR3/1333 Corsair DRAM, an EVGA GeForce GTX 280, a Western Digital Raptor 150, and 64-bit Windows Vista Home Premium.

VERDICT 9

ASUS MAXIMUS III FORMULA

+ M.I. 3	− JAWS 3
X-Fi soft audio; good overclocking capabilities; RC features.	Isn't it too soon to lose PATA ports?

$250, www.asus.com



You can remotely monitor and overclock your Maximus III Formula using a second PC.

Polywell's Giada Ion-100 nettop is stylish, svelte, and silent.

Polywell Giada Ion-100

A dual-core machine you can Velcro to your TV

Last year, we came up with an idea for a living room PC that was so small you could Velcro it to the back of your HDTV. This PC would be capable of streaming all things TV and would allow you to finally tell your cable provider where to shove that RJ6 cable. That machine, unfortunately, never materialized, as the hardware just wasn't ready for prime time.

Little did we know that Polywell was reading our minds when it designed the Giada Ion-100. About the size of a double-decker DVD case, the Giada Ion-100 is a mostly full-featured PC featuring a dual-core processor, 2GB of DDR2/667, a 250GB hard drive, five USB 2.0 ports, Gigabit Ethernet, Wi-Fi, and even Windows 7. So, what sets this apart from other book-size PCs? The graphics. The Giada is the second PC we've tested so far with Nvidia's impressive Ion chipset (the first being HP's Mini 311 netbook, last month). Other small systems have featured Intel's pathetic GMA integrated graphics. Ion is far more powerful than the GMA945 graphics found in most nettops and is capable of accelerating Blu-ray content. The system's dual-core processor is Intel's Atom 330, which runs at 1.6GHz and features Hyper-Threading and a 64-bit instruction set.

Atom is admittedly the weakling in Intel's CPU line-up. We've long forgiven the chip for its shortcomings when powering $400 netbooks, but can we be so forgiving on a desktop? After all, in a Cinebench 10 benchmark run, the dual-core Atom with HT was only 33 percent faster than a classic Northwood 2.2GHz Pentium 4 sans Hyper-Threading. It's impressive that the Atom 330 achieves that while consuming one-sixth the power of the P4 chip, but then again, that chip is eight years old. To get an idea of how a modern enthusiast part compares, consider that a Core i7-870 is about 1,700 percent faster than the Pentium 4 in the Cinebench 10 benchmark.

Of course, a machine like the Giada is not about video encoding, or 3D rendering, or gaming. You'll take the Giada, connect its HDMI cable to your HDTV, turn on the Wi-Fi, and start surfing the web on 50 glorious inches of screen real estate. That's where the Giada should shine. In the positive column, given the diminutive size of the Giada, the notebook hard drive, and the external power brick, it's damn-near silent. You would never know the machine was there even during the quietest moments of television watching. Also in the positive column, the Giada is capable of playing Blu-ray content. Paired with Asus's sweet SBC-04D1S-U Blu-ray USB drive, we played Blu-ray movies without issue. Our only problem came when the onscreen overlays were displayed; the frame rate would drop noticeably.

That leads us to the negatives. Hitches continually vexed us in the one thing the Giada should be perfect at: streaming HD video. While standard-definition video was handled easily, some sites, such as Hulu or YouTube in HD, were laggy when running at full screen even with the latest GPU-accelerated Adobe Flash player installed. On other streaming sites, such as Vimeo, the Giada was mostly OK, but even there occasional hitches hurt the experience. So what's the problem? That's hard to say since we're depending on the reliability of the video sites we're visiting, but our gut says the Atom is just too under-powered to push content at 1920x1080 resolution without a hiccup or two. By comparison, a standard desktop machine running simultaneously alongside the Giada had no hitches. Polywell's use of DDR2/800 in single-channel mode instead of DDR3/1333 in dual-channel mode also hampers the machine's gaming capabilities, as limited as they admittedly are.

That puts the Giada in a bit of a tough spot. If we experienced flawless performance at the one thing the system is seemingly built for, we'd be inclined to say this is the perfect streaming PC, but it falls way too short there for our tastes. —GORDON MAH UNG

BENCHMARKS

	Polywell Giada Ion 100	Lenovo IdeaPad S12	HP Mini 311
Photoshop CS3 (sec)	**552**	708	738
MainConcept (sec)	**8,858**	15,060	14,460
3DMark03	3,371	710	**4,196**
Quake 3 (fps)	118	61	**142**
Quake 4 (fps)	29	4	**34**

We compared two Atom-based products to the Giada: the 1.66GHz Atom N280 HP Mini 311 with its Ion LE chipset, and the 1.6GHz Lenovo S12 Netbook with its Intel integrated graphics. Both netbooks are single-core machines with Hyper-Threading. Best scores are bolded.

SPECIFICATIONS

Processor	Intel 1.6GHz Atom 330
Mobo	Custom
RAM	2GB DDR2/800 in single-channel mode
Videocard	Integrated Nvidia Ion graphics
Soundcard	Onboard Realtek
Storage	250GB Samsung HM250HI (5,400rpm)
Optical	N/A
Case/PSU	Proprietary case /external power brick

VERDICT 6

POLYWELL GIADA ION-100

+ 30 ROCK

Amazingly tiny and quiet machine that you can hide anywhere.

– HARD ROCK

Atom, even dual-core, is still underpowered for the chore.

$450, www.polywell.com

Corsair Obsidian 800D

Corsair's first chassis wins our hearts

Go big or go home. That's a lesson Corsair apparently took to heart for its first chassis, a 24x24x9-inch full-size enclosure that rivals Cooler Master's ATCS 840 in size. Corsair's Obsidian 800D is all black, from its matte steel frame and side panels to its brushed-aluminum front bezel, from motherboard tray to front-panel cables, from screws to standoffs (check out page 69 for the beauty shot). And the goodness is more than skin deep—the 800D has everything you'd expect from a premium case: quick-swap SATA bays, thermally isolated compartments, plenty of cable-routing cutouts, and more. In fact, it's one of the best cases we've tested in years.

The 800D is divided into several "cooling zones": the top compartment with the motherboard and optical bays; the bottom compartment, where the power supply sits; and a front compartment with four hot-swap 3.5-inch SATA bays. Each compartment is cooled by a separate 14cm fan, and the top compartment has room for three additional 12cm exhaust fans, as well as support for liquid-cooling radiators. Fresh air is drawn in through dust-filtered intakes at the bottom of the case, which is lifted one inch off the ground by three supporting feet.

The main compartment supports ATX, microATX, and EATX motherboards, and features the largest CPU backplane cutout we've ever seen, taking up the entire upper left quadrant of the motherboard. The motherboard tray also features 11 rubber-rimmed cable-routing cutouts, which means even cable-routing schlubs can wire up a clean and attractive build simply by routing everything behind the tray. However, you'll still have to exercise some amount of foresight, as clumping too many cables behind the tray will make the right side panel bulge a bit.

The case has two sets of rubber-rimmed holes for water-cooling tubes—one set between the bottom and middle compartments, and one set on the case's upper rear panel.

The five optical bays are toolless, although the retainer clip doesn't seem as sturdy as Cooler Master's. The four hot-swap 3.5-inch bays are thermally isolated by removable plastic baffles and cooled by a 14cm fan, which draws air over the drives and exhausts to the lower compartment, to avoid heating up the main board components. The baffles also cover the backplane of the hot-swap bays and route its four data cables and four-in-one SATA power cable behind the motherboard tray. Two additional 3.5-inch bays at the bottom of the case can be utilized by removing the front faceplate and attaching drive rails to the hard drives. These bays can be cooled with the addition of a 12cm fan.

The 800D is Corsair's first case, and it has a few quirks. The power supply bracket on the 800D's first production run, for example, couldn't accommodate power supplies with hexagonal AC cable mounts. Corsair PSUs weren't affected, but plenty of other manufacturer's PSUs just wouldn't fit. The problem has been corrected in later runs, though.

Although the Thermaltake Level 10 (reviewed Holiday 2009) turned the heads of nearly everyone who saw it, including non-enthusiasts, every enthusiast who came into our Lab was more excited by the Corsair 800D. It's enormous, well built, and crammed with power-user features. For $300—just $20 more than the Cooler Master ATCS 840 when it launched—it's a killer case. We can't wait to see the midtower version. **—NATHAN EDWARDS**

The case interior is roomy and packed with cable-routing cutouts. Wiring up a clean-looking case is almost too easy.

MAXIMUM PC KICK ASS!

VERDICT 9

CORSAIR OBSIDIAN SERIES 800D

+ 8t88	− 80s
Hot-swap SATA bays; roomy; great cable management and airflow; support for water-cooling; well-constructed.	Huge; steel frame rather than aluminum; pricey.

$300, www.corsair.com

NEC LCD3090 WQXi 30-inch Display

Wow, what a view!

We saw how splendid an IPS monitor can be when we reviewed Dell's 24-inch UltraSharp U2410 in January. "Sometimes you have to pay to play," we concluded. Moments after reaching that summit, we observed NEC's 30-inch LCD3090 WQXi IPS panel looming before us. Fully aware that we could buy three U2410s and a Radeon HD 5870 to drive them for about the same amount of cash ($2,200, to be exact), we began our ascent.

The LCD3090 has a native resolution of 2560x1600 (a 16:10 aspect ratio), which is typical of 30-inch displays. This one is an eight-bit panel with programmable 12-bit lookup tables. It delivers 102 percent of the NTSC color space and 97.8 percent of the Adobe RGB color space. Inputs are limited to dual-link DVI-D with an odd HDCP on/off feature, and DVI-I. Why would you need to turn off HDCP? We're not really sure.

There's no media card reader or integrated USB hub; more importantly, there's no DisplayPort support, either. But the stand tilts, swivels, and pivots; and if you still can't find a comfortable position, you can mount it on an optional articulated arm using its standard VESA mount.

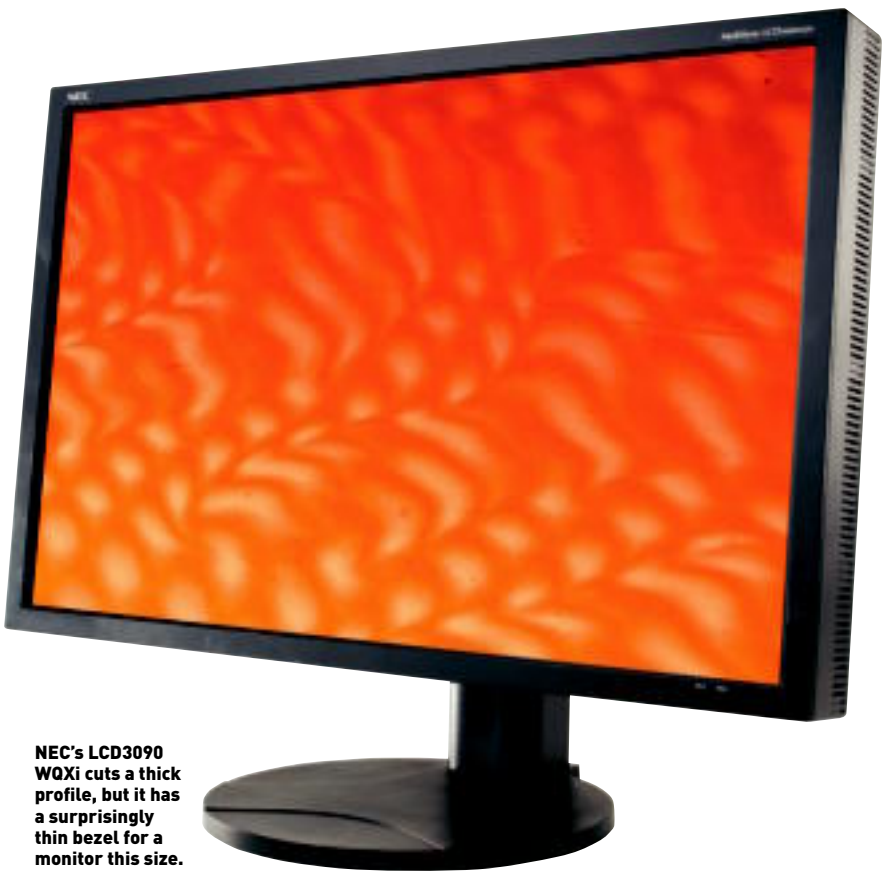
The oxygen is mighty thin at this altitude, but that's not why this monitor left us as giddy as a teenage Sherpa taking a first sip of Rakshi. The LCD3090 is, quite simply, gorgeous. We were surprised to discover that the monitor arrived with its brightness level at 100 percent, but this gave us an opportunity to check out the controls. You press one button to bring up the onscreen display and manipulate two toggle buttons to navigate the menus (a third button resets the display to its factory defaults). The buttons are difficult to see in a darkened room, but when you press the menu button, a text overlay pops up on the screen next to them. This renders the onscreen display very easy to use.

While evaluating the display using DisplayMate Multimedia with Test Photos Edition (www.displaymate.com), we detected the tiniest amount of backlight leakage at the top of the display in the dark-screen test, but only after we completely darkened the room. Other than that, the monitor delivered excellent color uniformity and purity.

Most of us would never consider spending such a sum on a monitor without justifying it as a business expense, but this screen's performance with games is every bit as intoxicating as it is with design and media-editing applications, thanks to a 6ms gray-to-gray pixel response time. And you haven't played Left 4 Dead until you've experienced it at the native resolution of a monitor this large. We switched to the single-player campaign for an hour or so, just so we could study the zombies in all their eviscerated glory.

That brings us to the only issue with the monitor: It can't support HDCP at 2560x1600 resolution, only at 1920x1080. This can be fixed by installing SlySoft's AnyDVD HD (after buying the app, natch), which will circumvent the HDCP protection. Of course, this panel is aimed at pros who push pixels all day in CAD/CAM and graphics apps, but that inability is the one thing keeping the monitor from a Kick-Ass Award. If you can look past this limitation and you need panel real estate with an eye toward color-critical work, the LCD3090 WQXi is truly glorious to behold.

—MICHAEL BROWN



NEC's LCD3090 WQXi cuts a thick profile, but it has a surprisingly thin bezel for a monitor this size.

VERDICT 9

NEC LCD3090 WQXi 30-INCH DISPLAY

+ GRAPHIC NOVEL	− GRAPHIC LANGUAGE
IPS panel; relatively fast response time; supreme performance; ergonomic stand.	Crazy expensive; no DisplayPort; lacks dual-link HDCP support.

$2,200, www.necdisplay.com

If you don't need the wireless feature, give the original ProMedia 2.1 a listen; Klipsch says the two systems look and sound alike, and the wired model is 50 bucks cheaper.

Klipsch ProMedia 2.1 Wireless Speakers

Klipsch storms its way onto our Best of the Best list

Every portable computer, from the brawniest desktop replacement to the tiniest netbook, has one thing in common: terrible speakers. There's no shortage of powered speaker systems on the market—some of which are very good—but what's the point of using a laptop if you have to tether it to a box to get good sound?

Klipsch has a better solution: The ProMedia 2.1 Wireless uses a USB transmitter to send audio from the host PC to the speakers over the airwaves. The speakers themselves are all hardwired, with the amplifier tucked inside the subwoofer. And lordy, what a subwoofer it is. There's a 6.5-inch long-throw, side-firing driver housed inside a bass-reflex enclosure with a front port. The sub cabinet also houses the wireless receiver and the 200-watt amplifier that powers all three channels. Klipsch claims line-of-sight range of 30 feet and our experience backs that up. If you're looking for a wireless audio system that will send audio from a computer in one room to speakers in another, this isn't the right solution.

The two-way satellite speakers consist of 25mm polymer tweeters mated to Klipsch's well-known MicroTractix horn. Mids are produced by three-inch long-throw drivers. The right-hand satellite cabinet houses a master volume control and a separate control for bass volume, a 1/8-inch headphone output, and a 1/8-inch auxiliary input. This input provides +6dB input sensitivity to compensate for the low output voltage that many portable digital media players deliver; take heed if you're feeding it from an AC-powered source. The satellites can be mounted on either the included desktop stands or on a wall using an optional Klipsch accessory (model WB-1 wall brackets, which sell for $22 a pair).

We predict few people will go the wall-mount route. You could splice more wire to the hardwired speaker cables that connect the satellites to the subwoofer, but there's no way to lengthen the 10-foot proprietary control cable attached to the right-hand satellite. There is no remote control, either included or available as an optional accessory, but that's not all that uncommon for speakers in this price class.

We like our bass like we like our beef—served up in thick, juicy slabs—and the ProMedia 2.1 Wireless certainly didn't disappoint on that score. The subwoofer was a kick with games (exploding Left 4 Dead Boomers practically pushed us back in our seats), but we also auditioned the system with a range of music (everything from Lucinda Williams to Herbie Hancock) and it managed to deliver a tight and coherent bottom end with everything. The satellites are a touch bright for our taste, but that just reminded us that we probably didn't need to crank the volume quite so high. Most people will use these speakers as near-field monitors, but they filled our 13x9-foot media room with well-balanced sound and plenty of headroom to spare.

These are great speakers and they're reasonably priced; they've certainly earned a spot on our Best of the Best list. **—MICHAEL BROWN**

MAXIMUM PC KICK ASS!

VERDICT 9

KLIPSCH PROMEDIA 2.1 WIRELESS

+ PAUL THORN	− TOBY KEITH
Wireless connection to audio source; beefy bass response; powerful and efficient amplifier.	Hardwired cables in satellites; no way to lengthen right sat cable.

$200, www.klipsch.com

Toshiba Satellite T115

When portable worlds collide...

It looks like a netbook, costs the same as a netbook, but it's got an honest-to-goodness Pentium processor.

Gone are the Atom processor's days of monopolizing the low-cost mobile-computing market. This should come as welcome news to folks who want the price and portability benefits of a netbook but more robust performance.

Take Toshiba's Satellite T115 as an example. To say that it has an 11.6-inch diagonal screen, weighs 3.6 pounds, and is coated in a high-gloss black finish inlaid with a subtle geometric pattern is to describe any number of netbooks on the market today. The fact that the T115 costs $480 only drives home the similarity.

And yet, the T115 is different from netbooks in one very significant way. It houses a traditional notebook processor. It's just a single-core, single-threaded, 45mn, 1.3GHz Pentium M, but that proved plenty sufficient for making mincemeat of our zero-point netbook's benchmark scores. That machine's Atom N270 is clocked 23 percent higher at 1.6GHz, but the Pentium beat it by massive margins—from 27.4 percent in MainConcept all the way up to 128.7 percent in 3DMark 03.

The T115 also outperformed our zero-point at streaming high-def video. We compared the two machines playing a high-def video clip from Vimeo.com in full-screen and found that, despite the occasional dropped frame, the video was altogether watchable on the T115, but not so on our zero-point, where the screen would frequently freeze and drop large chunks of content.

Not surprisingly, however, the T115 is no match for an Ion-enabled netbook when it comes to gaming. While the T115 was vastly superior to the HP Mini 311 netbook (February 2010) in our Photoshop and MainConcept benchmarks, the latter's Nvidia graphics chipset made it 35 percent faster in Quake 3 and a whopping 77 percent faster in Quake 4, albeit at a just-barely playable 34fps.

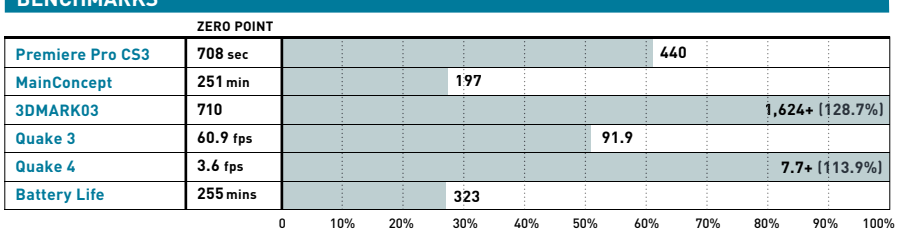
The thing is, are you buying a machine of this size more for games (and old ones, at that) or for general computing chores? If you tend toward the latter, there's really no contest. Besides offering more processing power than a netbook, the T115's 1366x768 screen, 2GB of DDR3/800 (upgradeable to 4GB), 250GB HDD, and Windows 7 Home Premium OS trump the typical specs of its Atom-based counterparts—for little or no extra cost in some cases. What's more, the T115 features competitive battery life, delivering more than five hours of continuous video playback on a full charge.

Like any budget portable, the T115 has its compromises. The keyboard feels a little cramped, and the function buttons are particularly small; worse, the single bar that serves as the right- and left-mouse buttons is stiff and a bit awkward to use—it definitely takes getting used to; and the speakers are weak. But overall, the T115 offers excellent value for the price. —KATHERINE STEVENSON

SPECIFICATIONS

CPU	1.3GHz Pentium SU2700
RAM	2GB DDR3/800MHz
Chipset	Intel PM45
Hard Drive	250GB Toshiba MK25555GSX (5,400rpm)
Ports	Ethernet, VGA, HDMI, two USB 2.0, eSATA/USB, headphone, mic, 5-in-1 card reader
Lap/Carry	3 lb, 6 oz /4 lb, 1 oz

BENCHMARKS



Our zero point netbook is a Lenovo IdeaPad S12 with a 1.6GHz Intel Atom N270, 1GB of DDR2/667, a 160GB hard drive, Intel GMA950 integrated graphics chipset, and Windows XP Home SP3.

VERDICT 9

TOSHIBA SATELLITE T115

+ SPUTNIK	− SPUTNIK II
Pentium M processor; more RAM, storage, and screen res than most netbooks; low price.	Small keyboard; funky right/left-mouse bar; only good for ancient games.

$480, www.toshiba.com

Kodak Zi-8

The power-users' pocket cam

If you've been eying Flip Video's popular MinoHD (reviewed March 2009) but have been put off by the simple-enough-for-simpletons approach, Kodak's Zi-8 is the pocket cam you've been waiting for.

Think of Kodak's feature-rich Zi-8 as the anti-Flip camera. While you can't change the battery on the MinoHD, you can on the Zi-8. Can't change the mic-input levels on your MinoHD? On the Zi-8 you can. Can't play back footage in slow-motion on your MinoHD? Or run an external microphone? Or use your own SD cards? Or take still images? You get the point.

Kodak seems to have taken every geek's wish-list for a pocket video cam and implemented it in the Zi-8. Slightly paunchier than Flip's Mino series but comparable to Flip's Ultra, the Zi-8 has modes for WVGA, 720p, 1080p, and even a 60fps 720p mode for sporting events. But wait, there's more: Kodak also includes a macro mode, face-detection focusing, and an image stabilizer—hell, those guys even include a charger and HDMI cables, too!

Start-up time on the Zi-8 is just less than two seconds, fast enough that you'll likely never miss a shot. The stabilizer isn't an optical stabilizer but it's still far better than going without one.

Files on the Zi-8 are written in the Apple QuickTime format, while Flip uses the obscure 3ivx codec. That makes sharing of the native Flip files a bit more complicated, while anyone with QuickTime can view the Zi-8's.

Not all of the Zi-8 features surpass the top-selling Flip's, however—the Zi-8 records only in mono using the onboard mic. The external mic jack, though, does support stereo content.

Video quality from the Zi-8 is good—for a pocket cam. We've never found pocket-cam footage to be particularly spectacular. In fact, HDV footage at 1440x1080 on tape looks far superior to the 1080p 1920x1080 from the Zi-8, thanks to the former's larger sensors and higher bit rates. The footage from the Zi-8 isn't bad, but there are compression artifacts that become quite noticeable at 1920x1080. Low-light performance is fair for this class of cam but a bit worse than with Flip's cams, which have slightly more light-sensitive lenses.

Panning quickly with the Zi-8 definitely reveals the weakness of the cam's rolling CMOS sensor. Rolling sensors don't take an image across the many photosites in the sensor simultaneously; instead, the image is captured by scanning down the sensor, usually in a top-to-bottom direction. If you pan or wiggle a video camera fast enough, the subject matter will have moved by the time the camera has scanned that part of the shutter and produce a Jell-O effect. It's not just the Zi-8 that's affected, but all CMOS-based consumer cameras.

The Zi-8's audio is also weak. In a head-to-head with a MinoHD, the MinoHD's audio was clearly better than the Zi-8's, which sounded much softer. That's with the audio gain on default, though. Increasing the gain gets the Zi-8 closer to the competition's generally good sound.

The truth is that the video and audio from the Zi-8 is far from stellar, but for this class of device, you're not going to be making a masterpiece. What the Zi-8 does do is take the pocket cam to the next level. Perhaps with the Zi-9 or Zi-10, we'll see the end of the camcorder completely. —GORDON MAH UNG

MAXIMUM PC KICK ASS!

KODAK ZI-8

VERDICT 9

+ 2001	− 2012
Replaceable battery, 1080p, included cables and charger, and SDHC support make the Zi-8 king.	Slightly bulky; audio is not sensitive; UI is slightly confusing.

$180, www.kodak.com

Kodak's Zi-8 is a good bridge between the camcorder and pocket-cam devices.

Patriot Box Office

This versatile media streamer isn't quite a blockbuster

Media streamers—devices that put your PC's video files on a big-screen TV—are emerging as the next hot product category, as more people look to move downloaded and transcoded movies from the desktop into the living room. Patriot's Box Office is a low-cost media streamer that's configured much the same as its similarly priced competitors, but includes a few unique hardware features to help differentiate it from the crowd.

Powered by a 400MHz Realtek chip, the Box Office plays video and audio files from USB-connected portable hard drives and flash keys (PC-formatted only), funneling high-definition media to your TV with either an HDMI or composite interface. An Ethernet port lets you stream files from a NAS box, but network connectivity feels a bit wasted without the ability to tap into web services like YouTube or Pandora. The native BitTorrent client, however, is a welcome feature.

Video format compatibility is generous; the device played all of our high-bitrate 1080p test files and even worked with FLV Flash and RealVideo (though a firmware update is recommended out-of-box for improved MKV file playback). We recommend sticking to connected USB drives for videos, as network-streamed HD videos showed minor visual artifacts. Audio format compatibility is sufficiently robust, but while DTS decoding is supported, the Box Office can't pass through DTS HDMA or TrueHD audio to receivers, which will leave some audiophiles disappointed.

The Box Office's brushed-metal chassis is a little bigger than the WD TV Live, but still has a smaller footprint than a DVD case. That larger size is due to its inclusion of an internal 2.5-inch drive bay for an optional SATA local storage device (not included). We only needed to remove two screws to pop the device open for a really easy drive install. An included Mini USB cable lets you connect the device to a desktop PC, which recognizes the Box Office as just another portable hard drive so you can copy your files onto it. But since we had no problems streaming files off external USB drives or a wired network connection, we only used the internal drive to store files downloaded with BitTorrent.

Unfortunately, the Box Office's Achilles' heel is its user interface. File navigation felt clumsy and slow, and diving through layers of directories on networked servers is frustrating. It's up to you to organize your files before connecting to the Box Office, but we wish its UI was smarter at discovering and sorting files. This seems to be a limitation of the Realtek chipset and software stack, as the media streamers we've seen using the 500MHz Sigma chipset don't have this problem.

With a street price of $100, the Box Office is competitively priced at the low end of the media-streamer spectrum. It won't replace higher-priced alternatives, but its unique features and robust operation make it more than just a budget box.

—NORMAN CHAN

PATRIOT BOX OFFICE

VERDICT 7

+ HBO	− LIFETIME
Wide file-format support; internal hard drive bay; HDMI cable included.	Generic and clumsy menu; no Internet services; no DTS pass-through to receiver.

$130, patriotmemory.com

A clumsy and laggy file browser mars the user experience with the Box Office.

Western Digital My Book Elite 2TB

WD's backup/restore software is actually useful

It's been a long time since we reviewed a USB external drive—not since November 2008, to be exact—mostly because they're essentially commodities now. With transfers capped at USB 2.0 speeds and drive sizes mostly standardized, portable hard drives have had few features by which to distinguish themselves from their peers—the usefulness of included software, eSATA support, and full-disk encryption among them. On the eve of USB 3.0 drives, the Western Digital My Book Elite 2TB seems to be the state of the USB 2.0 drive art, with a custom e-ink display. But is it more than a gimmick?

The My Book Elite shares the vaguely book-like formfactor of the My Book World and Essential lineups, but along its "spine" is the e-ink display, which shows a custom 12-character drive label, a capacity meter, and a little lock icon if you've enabled disk encryption. Despite its limited usefulness, we dig it—mostly because we geek out over any applications with e-ink.

Backup, restore, disk encryption, power options, and changing the display label are all handled by WD's SmartWare software, which mounts from a virtual CD partition on the My Book. Backup is intuitive, though not very fine-grained, and files can be restored either to their original locations or to a restore folder on your computer. The drive can also be set to back up continuously when the drive is plugged in.

The My Book Elite's transfer speeds, as expected, are constrained by its USB 2.0 connector—no FireWire or eSATA here. Strangely, the average write speed was lower than either a bare WD Caviar Green drive in an external cradle or the 500GB SimpleTech ReDrive, at about 20MB/s compared to the others' nearly 30MB/s writes.

The My Book Elite is reasonably priced, powerful, and intuitive, and although power-users will lament its lack of eSATA and opt for their own backup software, the drive offers users easy backup and restore, full-disk encryption, and an unnecessary but awesome e-ink label. **—NATHAN EDWARDS**

Is the e-ink display really necessary? Maybe not, but we dig it.

BENCHMARKS

	My Book Elite (USB)	SimpleTech Redrive (USB)	WD Caviar Green in Thermaltake BlacX Dock (USB)
Capacity	2TB	500GB	2TB
HDTach Avg. Read (MB/s)	**30.2**	29.8	30.2
HDTach Avg. Write (MB/s)	26.1	28.0	**28.3**
HDTach Burst (MB/s)	32.8	**34.9**	32.6
HDTach CPU Utilization	12%	7%	**6%**
HDTach Random Access (ms)	21.4	**14.4**	15.9

Best scores are bolded. HD Tach version 3.0.1.0 used.

VERDICT **8**

WESTERN DIGITAL MY BOOK ELITE 2TB

+ ELITE (HALO SERIES)	– 31337 (HALO PLAYERS)
Good looks; cool display; intuitive backup software; full-disk encryption.	Write speeds slower than expected; no eSATA.

$280, www.wdc.com

The Saboteur

'Cuz what you see you might not get

Blowing up Nazi equipment gives you resources you can use to buy bombs that you can use to blow up more Nazi equipment. Everybody wins! (Except the Nazis.)

Somehow, blowing things up never gets old—especially blowing up Nazis. Sixty-five years after the fall of the Third Reich, it's still a gaming favorite.

As the titular Saboteur, Irish mechanic turned French freedom-fighter Sean Devlin, you throw a wrench into the gears of the Nazi occupation in 1940... except this wrench is actually a wad of TNT that detonates in a spectacular fireball. The game equips you with an ample pile of explosives and turns you loose in a target-rich open-world version of Nazi-occupied Paris (complete with Eiffel Tower and Louvre) and its surrounding rural areas. Much of the joy of playing comes from planting bombs on poorly guarded Nazi equipment and casually strolling out of the blast radius before it blows, then watching it crumble down, jackbooted thugs and all.

Sure, the story, which follows Sean's quest for revenge against a sadistic S.S. officer/race car driver is a little hammy and more than a little absurd, but it doesn't take itself too seriously. In fact, it works well with the roguish Indiana Jones–style attitude of the character. The voice actors play along, delivering entertaining performances with caricature Irish, French, and German accents.

There's a touch of *Schindler's List* here, too. Until you liberate them by completing a few missions, Parisian neighborhoods under the heel of the Third Reich have the color drained from them, except for important items like weapons and red swastika armbands. The effect gives The Saboteur a distinct and very cool look, as well as effectively helping you spot threats quickly in a firefight.

Sean borrows driving and shooting skills from Grand Theft Auto, wall-climbing and stealth-killing abilities from Assassin's Creed, and a knack for Nazi uniform–stealing from Hitman. All of these elements blend together surprisingly well, allowing you the freedom to approach your bombing and assassination targets by running and gunning, sniping from the rooftops, infiltrating in disguise, or simply bombing their cars. A few story missions are designed like corridor shooters, such as a battle through the inside of a burning zeppelin, but they're usually brief and enjoyable. Simplistic enemy AI and rapidly recharging player health keep the third-person Nazi-killing action fast-paced and cartoonish, and it feels great on a mouse and keyboard. Driving feels a little too "bumper car" in its lack of damage modeling or consequences for running down Parisian civilians, though, and the menus and map screen could've used some more work to improve mouse-friendliness.

It's unfortunate that the campaign of this single-player-only game doesn't finish as strong—the story deteriorates in the third act, failing to tie up loose ends, and lazily concluding Sean's revenge quest. But that doesn't interfere with the core enjoyment of blowing things up, so it's easy to let those flaws slide.

However, in a staggering failure of quality-assurance testing, out of the box The Saboteur simply won't work with ATI graphics cards. As of this writing, EA has released a beta version of a patch to remedy the problem that has shown some success in tests, but until it's finalized, cautious Radeon owners shouldn't risk sabotaging themselves. **—DAN STAPLETON**

Sneaking up behind an enemy and breaking his neck avoids messy getaway chases.

VERDICT 6

THE SABOTEUR

+ FRENCH KISS	− JERRY LEWIS
Fun with explosives; fast-paced action; black-and-white graphical filter.	Huge ATI crash/ v-sync bug; weak third act.

$49, www.pandemicstudios.com/thesaboteur, ESRB: M

Dragon Age: Origins

Fantasy role-playing games, bow before your new king

This is more or less your default camera view—though, more often than not, giant lightning balls don't cloud your vision.

Dragon Age: Origins is the first in a new franchise from role-playing powerhouse BioWare, and while its swords 'n' sorcery setting may, at first glance, appear to be the result of an especially fruitful attempt at robbing J.R.R. Tolkien's grave, don't let that fool you. Dragon Age may very well contain one of the finest, most compelling videogame worlds ever created.

But that on its own isn't what makes Dragon Age great. Rather, the game's heart lies smack-dab at the intersection between setting and character development. It's a fine line that many sprawling RPGs attempt to walk, yet BioWare has managed to cross the proverbial tightrope with startling ease. Chalk it up to years of experience with similar games, but with Dragon Age, BioWare has truly perfected its craft.

The story initially appears to be something of a straight line but quickly spins out into a complex web, with you at the center. It's a surprisingly personal experience—especially when contrasted with other story-based RPGs—that begins with your choice of an origin story. Depending on your race/class combination, you'll encounter any one of multiple, wildly different opening scenarios. Your origin, then, follows you through the rest of the game. Human, elf, or dwarf, male or female, rich or poor—the whole game changes in ways both big and small to reflect your humble (or not-so-humble) beginnings.

Dragon Age's supporting cast is equally diverse and well developed. We won't spoil anything, but let's just say that you'll be forced to make some incredibly difficult choices over the course of the game. At different times, it's both tear-jerking and goofy grin–inducing, but regardless, you will feel something when you play Dragon Age. Through the overarching plot and endearingly humorous mini-conversations your party conducts while strolling around, characters take on lives of their own. We could spend countless pages discussing our interactions with the game's cast. Needless to say, we loved it.

But what's a fantasy epic without a healthy dose of sword-swinging and spell-slinging? Fortunately, Dragon Age gives turn-based action a much-needed kick in the pants, literally coating combat in blood with a multitude of techniques and hard-hitting magic. Don't think, however, that battles are mindless affairs.

In reality, Dragon Age's battles can be taxingly tactical, and while the PC version's exclusive pulled-back camera view makes the action much more manageable, Dragon Age is hard, but never unfairly so. Experiment with strategies and you'll be rewarded. The game also alleviates some of your stress by allowing you to automate party members with customizable tactics. Meticulous micromanagement, however, wins the day more often than not, and if you're not into that kind of thing, you'll probably want to play on easy. For those whose brains have been starved by recent RPG offerings, though, Dragon Age's combat system is just what the doctor ordered. Just bear in mind that between the game's complex combat and meager tutorial, neophytes need not apply.

After nearly 50 hours with Dragon Age, we couldn't bear the thought of finishing the game. To us, it was like some kind of amazing dream, and we simply despised the idea of waking up. **—NATHAN GRAYSON**

Battles are surprisingly action-packed for turn-based affairs.

MAXIMUM PC KICK ASS!

VERDICT 9

DRAGON AGE: ORIGINS

+ DRAGONS	− DUNGEONS
Well-written characters and story line; challenging but not frustrating tactical battles; hours upon hours of content.	A huge graphical leap backward from Mass Effect; unabashedly tailored toward experienced RPG players.

$49, www.dragonage.com, ESRB: M

LAB NOTES

First Look at USB 3.0

SuperSpeed USB finally arrives; eSATA doom likely

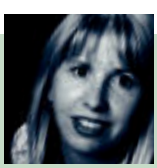
NATHAN EDWARDS
SENIOR ASSOCIATE EDITOR

Just before this issue went to press, we got our hands on WD's My Book 3.0. It doesn't have an e-ink display or capacity meter, like the My Book Elite (page 89), but it does have USB 3.0 support. The $200 1TB version ships with a USB 3.0 x1 PCI-E adapter card—useful, if you're not one of the four people who already have USB 3.0 support on your motherboard. In our preliminary tests, we saw average read speeds of nearly 87MB/s over USB 3.0, with average writes around 66MB/s—much better than USB 2.0, which tops out at around 30MB/s for both.

Like SATA 6Gb/s, USB 3.0 won't be used to its full potential by mechanical hard drives—it'll take SSDs, faster than any we've yet seen, to approach USB 3.0's theoretical bandwidth limit of 640MB/s. Regardless, by moving the bottleneck back to the drive speeds, USB 3.0 just put eSATA on the endangered species list.

NORMAN CHAN
ONLINE EDITOR

Centimeter-thin TVs and iPhone-controlled helicopter toys are neat, but I was disappointed not to see any new 30-inch monitors at this year's CES. Display makers seem to be abandoning that format, opting to sell multi-monitor solutions such as Samsung's six-panel Eyefinity setup. Still, I'd rather use a new kick-ass 2560x1600 display than an array of 1080p screens—the bezels can't be ignored!



KATHERINE STEVENSON
DEPUTY EDITOR

Things are looking promising for bargain hunters in the über-portable notebook space. As my review of the Toshiba Satellite T115 (page 84) shows, CULV processors are now infiltrating the space previously dominated by the anemic Atom—with satisfying results. And news of Alienware's sub-$1,000 11.6-inch M11x notebook with discrete graphics gives gamers hope that they can have easy mobility and gaming in an affordable package.

WILL SMITH
EDITOR-IN-CHIEF

This month, I braved the electronics wastelands of the Consumer Electronics Show in Las Vegas—you can check out my favorite things from the show in The List on page 14—before heading back to the home office to clean up my desk, for the last time. What did I find? An original GeForce 5800 "Leaf-blower Edition," one of my fabled throwing pigs, and a whole lot of dust bunnies.

ALEX CASTLE
ASSOCIATE ONLINE EDITOR

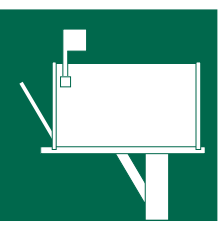
A whole bunch of set-top media PCs are on the way this year, including the very awesome-looking Boxee Box. I'm tempted, but still unconvinced. If the manufacturers want my money, they're going to need to show me something that their box can do that my spare 2-year-old laptop (and XBMC) can't.

GORDON MAH UNG
SENIOR EDITOR

I've finally upgraded to HDTV at home (yeah, I'm a cheap SOB, so what?) and am in the process of spec'ing and building a Home Theater PC. My plan is to ditch that monthly cable bill in favor of terrestrial-based ATSC combined with streamed Netflix, Hulu, Vimeo, and YouTube video. I'll report back in an upcoming issue.

We tackle tough reader questions on...

Microsoft and PC Gaming
PC Mover
The Great Star Trek Debate



But No One Plays PC Games

In regard to Will Smith's February column, "Why Microsoft Needs PC Gaming," I would challenge some of the assumptions. I question whether PC gaming "has traditionally been one of the key factors that keeps Windows users on Windows." I would argue that familiarity is what keeps Windows users on Windows. After all, what percentage of Windows users are serious gamers? I would be surprised if that number was 10 percent. Secondly, Office is not about to become a "commoditized cloud app."

Lastly, Microsoft is not funding development of games for the PC that appeal to a wider audience because it would prefer that audience to buy an Xbox 360. In this way, it gets to sell both hardware and software to the consumer for a higher overall profit.

—James Trent Corbett

Editor-in-Chief Will Smith responds: You'll note that I didn't say PC gaming is the *only* factor that keeps Windows users on Windows; I simply said it was important. And if you look at the gaming options available on other desktop computing platforms like OS X and Linux, they range from slim to virtually none. I'll agree with you that familiarity is a prime motivator for people to continue running Windows, as is the investment they've made in Windows-compatible hardware and software. However, as many of the most common Windows apps, like Office, begin competing with online cloud apps, people become less attached to Windows. While Zoho Office, Google Docs, and Microsoft's own online version of Office won't replace desktop clients for power users, they're more than sufficient for students creating papers and basic home use today, and they'll only improve.

Your third point supports my argument precisely. While Microsoft has made great inroads into the console gaming market, I wonder if that expansion has left the company's massive Windows and Office business vulnerable to erosion. Only time will tell.

PCmover Move, Moved Back?

In the Lab Notes section of the Holiday issue, Gordon Mah Ung said he was going to use PCmover to do an upgrade to Windows 7 and report on it in the next issue. But I haven't seen his report in the January or February issues. I also checked the website—not there either. What happened? I have a number of machines that I maintain at a nonprofit and I sure would like an easy way to upgrade them.

—Mitch Brodkin

Senior Editor Gordon Mah Ung Responds: Sorry, Mitch. Two kids, Christmas and New Years, and insufficient storage for migrating all the data from my Win XP notebook to a newer Win 7 notebook got in the way. I do, however, promise to get it done for the next issue—for real this time.

What Pad for My Mouse?

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to *Maximum PC* for a year now. However, I don't believe there have been any showdowns between gaming mice and mouse pads. There are many different manufacturers for each and confusion can develop quite quickly when comparing mice and the surface you want to use with them.

Maybe sometime in the near future you could do an article or two about gaming mice and mouse pads. After all, what good is a great mouse without a nice surface to use it on?

—Brent Paul

I AM A LONGTIME FAN OF STAR TREK, BUT UNLESS THINGS CHANGE, THIS IS ONE FAN WHO IS DONE

Editor-in-Chief Will Smith Responds: While we've reviewed quite a few gaming mice over the last few years, mouse pad reviews are something entirely different. We don't buy into the hype over spendy mouse pads. Now, don't take that as an endorsement of the cloth-coated neoprene pads that come with your average Dell. Instead, we like the super-thin stiffer surfaces, which minimize wrist tension while maximizing durability. Whether it's made of plastic, metal, or something else, these thin pads will work equally well for all but the hardest of the hardcore competitive gamer.

Star Trek: The Angry Letter

You missed the mark on #48 in the "Best of 2009" article (January). The reboot of *Star Trek* was tragic; the special effects were great and the actors did a good job, but the story *sucked*. C'mon, an alternate reality based on the fact that Spock wasn't fast enough to save Romulus with a black-hole device, and ends up back in time with the bad guy?!

Yes, I understand that Nero is pissed off that his planet and most of his people are gone forever. So what does he do? He travels back in time (more than 100 years) and pursues a vendetta against Spock.

He doesn't think about saving his planet. He doesn't think that with all this advanced technology, he can rule his people and take over both the Federation and Klingon Empire, along with anyone else in the galaxy. That is what any self-respecting Romulan would do.

So J.J. Abrams screwed up *Star Trek*.

I am a long-time fan of *Star Trek*, but unless things change, this is one fan who is done. I know that I am not the only one who feels this way. Gene Roddenberry would not have allowed this.

—Craig Mummert

Lt. Commander Norman Chan Responds: The *Star Trek: Countdown* prologue comic book established the reasons behind Nero's deep hatred for Spock. In addition, after traveling 154 years to the past, Nero actually spent 25 years in a Klingon prison seething and plotting his revenge, which explains his dedication to that cause. Furthermore, destroying the Federation was exactly what he had in mind, as he would have more than 100 years to exact his vengeance on Federation and Klingon worlds before preventing the destruction of Romulus.

The fact that J.J. Abrams's alternate universe was an extension of canon as opposed to a straight rewrite is a testament to his reverence for the *Star Trek* universe. The exceptional quality of the film and subsequent overwhelmingly positive reception speak for themselves.

Commander Gordon Mah Ung Chimes In: I wouldn't go so far as to say that it "sucked"—I actually enjoyed it—but I agree to some extent with Ensign Mummert that the movie had issues. Why would Spock ignore a massive change to the timeline when so much of the *Star Trek* universe hangs on making sure timelines are not altered? (See *TOS*: "City on the Edge of Forever," *TOS*: "Tomorrow is Yesterday," *TNG*: "Yesterday's Enterprise," *DS9*: "Past Tense, Star Trek: First Contact.") I'm sorry, but timeline continuity is as important as the Prime Directive and this isn't something as simple as transparent aluminum. J.J. Abrams might as well have mixed in a few Ewoks, Colonial Vipers, and Buck Rogers, to boot.

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LGA1156 MOBO

Asus Maximus III Formula

It was a close contest, but we think Asus's Maximus III Formula edges out the long-standing P55 king-of-the-hill GA-P55-UD6 in a few key areas. First, its audio subsystem is far richer. The MIIIF also automatically overclocks higher. Tweaking RAM to its fullest potential while keeping the system stable is also made far easier with the MIIIF's MemPerfect utility. Finally, there's the nifty remote monitoring and overclocking of the system via a USB-connected machine. Right now you can even monitor POST codes using USB, but perhaps in the future, you'll be able to use the remote function to run diagnostics too if you are having issues. See our full review and benchmarks on page 74. www.asus.com

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http://masseffect.bioware.com

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www.teamfortress.com

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www.modernwarfare2.com

Zombie Driver
www.zombiedriver.com

For even more Best of the Best entries, such as routers and budget components, go to http://www.maximumpc.com/best-of-the-best

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