

## Checklist for Building Your Own High Performance Computer...

Read the book, "Building Your Own High Performance Personal Computer," available at: [www.thepcbook.com](http://www.thepcbook.com). Read it beginning to end before buying anything.

Analyze your needs. Are you a true Power User i.e. video editor, digital audio editor, digital photographer, AutoCAD user, or demanding gamer? If so, you will be looking at more powerful Intel Core i7 CPUs such as the Haswell-E Core i7-5960X or earlier Devil's Canyon Core i7-4790K, perhaps an extra video card, larger case and a power supply with watts to spare. Performance users can also benefit from the newest technology...simply a little less of it. A Core i7-5930K CPU may be cost effective in a performance system. One video card and a 750 watt power supply should be adequate for most but dedicated gamers require two. Business machine systems benefit from the freedom of choice that selecting your own PC components can provide. Business Machine builders look for value but spend wisely when a particular component, such as a solid state drive (SSD) or large capacity hard drives that supports their work. A Core i5-4790 CPU is adequate for business machines hosting office applications. Don't surrender your freedom and buy an "off-the-shelf" PC with a shiny plastic case and junk inside. Please don't.

Develop a budget. Where to begin... I will spend \$4,000 for a dream system, \$2,500 for a performance system, \$1,500 for a very nice business machine. By the way, a separate budget for the monitor is advisable. Plan on \$2,000 top end, \$1,000 to \$800 damn good, and \$600 to \$450 acceptable. Can these budgets be cut by 20%? Yes they can, with dedicated research, patience, and thoughtful purchases, such as, looking for combination deals and taking advantage of sales.

Research components. This can be a very arduous task as change is constant in the PC component market. Some online and periodical reviewers are biased toward advertisers but a few PC magazines, such as Maximum PC, are quite candid. Unfortunately, some manufacturers, with a marketing budget of millions, would have done better to spend the cash on research and development. I respect name brands but suspect overly optimistic claims and marketing hype. Read about the experience of others by scanning product reviews in Amazon™, Newegg™ and TigerDirect™. Join a computer forum. Stop by Barnes & Noble™ and buy a few computer magazines.

☐ Pick an Intel™ CPU and stick with it. Build your system around the CPU. CPUs are supported by a number of different chipsets or PCH (Platform Control Hub) components that are designed to support Enthusiasts, Performance and Business Machines. A motherboard ties CPU, 288-pin DDR4 or 240-pin DDR3 RAM memory and chipset together in a platform that, hopefully, maximizes user experience. I like Haswell-E Core i7-5930K with an ASUS X99 motherboard or (alter ego frugal me) Haswell Refresh Core i7-4790 with a Z97 LGA 1150 ASUS or Gigabyte motherboard using economical DDR3 RAM.

☐ Select an ASUS™ or Gigabyte™ motherboard well admired by customers. I have seen some socket 1150 motherboards at great prices recently. Truly wise computer builders stay a generation behind the power curve and save 30% in overall costs. Their system may be only %12 slower than the latest, greatest. BUT I champion the latest greatest and so may you. Enthusiasts buy what they love, accountants buy what they need.

☐ Select memory modules that reflect your nature...seriously! If you are a bold video editor with a due date looming, 32GB of Corsair™ XMP high speed memory modules may well complement your needs. If you are an eager but thoughtful graphics artist, buy 16GB of Corsair XMP RAM with a respectable frequency. Reserved and budget conscious mid-level manager? All you need is 8GB “plug-and-play” XMP RAM from Crucial™, Corsair, ADATA™, Kingston™, G. Skill™ or Micron™. Slip the modules in the proper slots (after reading the relevant chapter in my book) and enable XMP in the BIOS. A dedicated RAM cooling fan is a good idea for power users. Download the motherboard’s Qualified Vendor List before buying RAM. Remember, more RAM trumps faster RAM which trumps RAM having faster timings i.e. tCAS latency.

☐ Buy a computer case that is, essentially, a practical rectangular box without round corners. Avoid cases with huge protruding fans, an odd design, or control panel features mounted on the top of the case. I suggest you buy a full-tower case but a mid-tower suits a Business Machine well. Corsair Obsidian cases are good.

☐ A power supply that regulates power fluctuations is a must have. Buy from Corsair, Thermaltake™ or Master Cooler™ and don’t buy cheap. You buy cheap, you buy twice. I laugh at any power supply providing less than 500 watts, I laugh! I laugh!

- Hard disks and SSD disks are in a price fight. You win. Look for a hard disk that spins at 7200 RPM and has a 64MB cache. Stay clear of anything else. Buy one SSD for speed but don't put all your money on them just yet. Buy Western Digital™ Black, Blue or Green drives. Samsung™ SSDs are among the best. I like Corsair and Kingston™ too.
- Optical drives are cheap. I like a quality Blu-ray™ drive. LG™ keeps coming up with reasonably priced, quality drives. Can't beat that.
- If you do not intend to overclock, buy a metal heatsink. If you intend to overclock the CPU buy a liquid CPU cooler. See the links list at [www.thepcbook.com](http://www.thepcbook.com) for what you need. There is also a link for great thermal paste there as well.
- Buy three or five extra fans for your case. Ventilate! Ventilate! Ventilate! A cool case will save you money in the long run. Motherboards or hard drives that fail after a few years may have suffered long with a hot poorly ventilated case. Mid to large cases use 120mm fans and large cases may use 140mm fans. Do not build a system without reading my [chapter about case ventilation](#).
- Buy an illuminated Logitech™ G910™ USB gaming keyboard and USB mouse. Sure it cost a little more (actually a lot more) but DAMN if they are not a JOY to use. Less expensive Logitech keyboards are also excellent.
- The Windows 10 Pro™ operating system is about the best mankind can hope for. Linux frustrates me and that Fruit system just don't quite cut it.
- Video cards are not needed if you buy Skylake S and hook everything up to a basic business computer monitor. However, if you like high-resolution and speed, you must pay for high-resolution and speed. Simple as that. A quality video card is not inexpensive. But a fast GPU using OpenCL is an asset to photographers and video editors. I like Nvidia™ and I am not ashamed! Buy a card with at least 2GB VRAM, 4GB VRAM for gamers and power users. The card must have a DisplayPort plug...must. DP is the future. I like my EVGA GTX 970 but the EVGA GTX 980 is to die for.

Buy all components within the return period, assemble, and leave the machine running for 30 days by adjusting the power settings in Windows, Control Panel > Hardware and Sound > Power Options > Edit Plan Settings > “Put the computer to sleep” > “Never.” It’s like this, if you fly out of LAX and the plane stays aloft for 30 minutes, you are pretty much home free. If you leave a new computer on for 30 days and the components do not crash, you probably have a keeper.

Keep boxes, wrapping, invoices, spare parts, manuals, serial numbers and Windows installation DVDs in a safe place...or you will be s-o-r-r-y!

Download and install all Windows updates after installing the Windows OS. Download, install, purchase, and activate Norton™ Anti-Virus and Malwarebytes. This is not an option soldier! We are fighting a war against piracy online and you are in the war like it or not.

Keep your machine in a safe place, supervise its use by children, don’t put unknown USB memory sticks or DVD’s in it, and do not open an email from the Prince of Bangladesh who wants to give you twenty grand. You can build, maintain, troubleshoot and upgrade your PC. Take my geek test after you read my book see: [www.thepcbook.com/geektest.html](http://www.thepcbook.com/geektest.html) | Double Dare you! And, please, with sugar on top, buy components using the link at [www.thepcbook.com/bestvalue.html](http://www.thepcbook.com/bestvalue.html).

Here is a really nice system, useful for beginning your research. You will be able to find better deals if you wait to buy components on sale or as part of a package deal: Intel Core i7-4790K CPU (\$310) or Core i5-4690K (\$240) or bargain Core i5-4590 (\$200), 16 GB DDR3 1866MHz Kingston HyperX Savage with XMP (Extreme Memory Profile) RAM memory (\$140), ASUS Z97-A ATX LGA 1150 motherboard (\$157) or the very well respected ASUS Sabertooth Z97 LGA 1150 (\$240), Corsair Hydro™ 100i (\$120) liquid cooler for heavy-duty applications or Silverstone TEK Low-Profile heatsink (\$40), EVGA GTX 960 2GB video card (\$210) or the bitchen EVGA GTX 970 4GB video Card (\$330), Roswell Mid-tower case (\$50) or Corsair Obsidian 450D (\$118) or Corsair Obsidian 750D Full Tower (\$150) for future expansion, Master Cooler Power Plus 500 watt power supply (\$100) or Corsair 850 watt 80 Plus Gold (\$150), Western Digital 2T Green hard Disk (\$80), LD Blu-ray read/write optical disk (\$54), Windows 8.1 64-bit (\$139) and two

high-quality extra case fans Antec 761345-75120-9 (\$18 for two). This ranges from \$1188 (better quality than Big Box system offerings at a similar price) to \$1731 for a truly superior system.

Non XMP RAM will cost up to 50% less but require BIOS entries for optimal performance. Always consult the motherboard's manual and website for a listing of qualified DDR3 or DDR4 RAM vendors. Desktop RAM is Non-ECC, Unbuffered.

Good luck and good night!

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