

# AWD-IT

## Knowing your motherboard from your graphics card

In the world of high-end PC gaming components, it's the graphics card that gets most of the attention. We're all looking to push as many pixels as possible, keep those frame rates sky-high, and turn all of the settings to 'ultra' in our favourite games.

But as much as we might focus on the latest offerings from NVidia and AMD, the truth is that even the most eye-watering graphics card is useless unless supported by the other elements of your rig. If you skimp on items like RAM, opting for 8GB rather than 16GB, then you might free up additional funds for a better graphics card – but the results won't be pretty when your system runs out of memory.

These sorts of situations are called performance bottlenecks – where a computer's performance is held back because one component isn't at the same level as the others. Imagine a Ferrari engine mounted onto bicycle wheels. On paper this makes for a fast method of transport; but would be at best impractical, at worst downright dangerous. Your PC can be undermined in the same way by that one inappropriate component.

Perhaps the most overlooked of all components is the motherboard. The importance of this component is hinted at by its name; it's the circuit board through which all the rapid-fire calculations flow. Buy the wrong motherboard and you'll likely impact your PC's performance. You might even be unable to assemble the thing in the first place!

Let's look at the considerations you might make before ordering your new motherboard – beginning with the most important, and moving on to those optional extras that'll make the difference in high-end gaming.

### Compatibility

The motherboard is where all of the components of your PC slot. But not all PC components are built alike – and this is for good reason. Competing CPU manufacturers like AMD and Intel build their products in a certain way, and there are several different RAM standards that are compatible with matching motherboards.

The best way to proceed, then, is to first choose a CPU. Intel CPUs are described in terms of the number of pins in the socket – LGA 1151 being the one used by the current generation of Intel gaming CPUs. As you might imagine, you won't be able to fit an LGA 1151 CPU into an LGA 1150 socket – and trying could damage both components! AMD create their CPUs according to their own standards – so select a motherboard to match.

Similar considerations must be made when it comes to RAM. If you take a look at the bottom of a stick of RAM, you'll see a notch around a third of the way along. This notch is placed slightly differently according to the type of RAM, in order to prevent you from mistakenly installing a stick of DDR4 into an incompatible DDR3 motherboard.

RAM is designed to run at different speeds, which synchronise with CPU's clock cycles via the motherboard. Check that your motherboard can run at the speed of your RAM. Motherboards can only support a given amount of RAM, but in most cases this number is absolutely enormous, and so not worth worrying about.



### How many graphics cards?

If you're looking to invest in a multiple-card setup, then this must be factored into your choice of motherboard. Motherboards come with different numbers of PCI-express sockets. A smaller motherboard might have just one, while larger and more expensive ones can have as many as four.

Moreover, as well as being physically able to accommodate multiple cards, a motherboard must be built to support either NVidia's Serial Link Interface (SLI) or AMD's Crossfire – and so your choice of graphics card manufacturer will also limit your motherboard choice.

### Size Matters

You'll need a motherboard that fits inside your case. While full size ATX motherboards are the preference of some gamers, micro-ATX boards and mini-ITX form factors are becoming increasingly popular, giving more choice in terms of size and aesthetics when it comes to selecting the right case. That said, it's almost always better to buy a case to accommodate your motherboard, not vice versa.

### What else?

We've narrowed our motherboard options according to our choice of CPU, RAM, and graphics card(s). But we'll also need to consider less concrete factors, such as the reliability and overclocking abilities of a motherboard.

If you're looking for a system that will push the envelope in high-end gaming, then you'll want one with a BIOS that's easy to navigate and make changes to. Premium motherboards that are built for gaming make it easy (and safe) to overclock your CPU. You'll also want to consider the extra ports that such boards offer for high-speed storage drives and USB devices – so be sure to look for support for 6GB/s SATA, and USB 3.0, or even USB 3.1

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