

# AWD-IT

## What do I need to know before building a computer? Part II

In the first of our two articles explaining what you'll need to build a PC, we took a look at some of the essential components, including the CPU, graphics card and RAM. In this, the second part, we'll take a look at some of the other components you'll need.

### Motherboard

Now that we have all of the components which will effectively do the work of our computer, we'll need to provide them with a means of communicating with one another. More than that, we'll need a means of securing them all into place within the case. In order to achieve both of these ends, we need an essential component – the motherboard.

The motherboard is a large circuit board, containing a number of sockets, into which a computer's RAM, Graphics card and CPU slot. At the rear of the board you'll find all of the sockets, which, when installed, form a panel at the rear of the computer, allowing you to connect your computer to USB devices, Ethernet cables, and the like. Built into the board you'll also find a few sockets, which you'll be using to connect the motherboard to the various storage and optical drives you might want to install into the computer, and any USB, headphone or microphone ports that you might have at the front of the case.

Though the motherboard is among the least glamorous of all the components you'll be installing, it's important that you buy one which matches the quality of the components you'll be putting into it. You'll need to ensure that the socket on your motherboard matches up with the chipset of your CPU. If you don't do this, then your CPU will not fit into the socket, and you won't have a computer. If you're going to be making use of SLI or crossfire technologies, then you'll need to be sure that the motherboard supports them. The same is also true of dual, triple, or quad-channel RAM.

### Power Supply

Your computer will need power in order to function. This power will need to be in low voltage, direct-current form, rather than the high-voltage, alternating current power that comes directly from your wall socket. In order to transform the latter into the former, you'll need a suitable power supply.

A power supply comes in the form of a big, heavy block that typically sits at the bottom of your case. It will provide all of the various drives with power, along with the CPU and motherboard. Your graphics cards will need a power connection of their own, since they'll be unable to draw the required amount up through the motherboard.

Power supplies are rated according to their wattage. Average gaming rigs will need smaller power supplies of around 500w, while more powerful ones might need 750w or more. Modern components are a great deal less hungry than their antecedents, and so it's possible to get away with a lower wattage.

'Modular' power supplies are those which, instead of having a lot of different cables sprawling out of one end of the power supply, have a number of sockets, into which cables can be inserted as they are needed. This allows you some flexibility, and allows you to free up some room in your case.

'Hybrid' PSUs are also available, which have permanent cables alongside sockets, allowing you to expand the PSU where necessary.

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## Storage

Naturally, you'll need somewhere in order to store all of the programs which make up your computer. Modern storage comes in two different forms:

### HDD

Hard Disk drives operate by storing your data on mechanical platters. These platters rotate at enormous speeds, and are read and written upon using a laser mounted on a moving arm, and stores data magnetically. These drives are capable of storing a lot more data than their cousins, but the speeds they can achieve are far slower.

### SSD

A newer development is the solid state drive. These are covered with tiny memory registers, not unlike the ones you find on a stick of RAM. They have no moving parts, and their lifespan is therefore much longer than that of a mechanical hard drive. They're also capable of enormous speeds, transferring hundreds of megabytes of data every second. While once these were restrictively expensive, now they can function as the sole drive on the computer.

As well as these two technologies, there are 'hybrid' drives which combine elements of each. Be sure, when buying your hard drive, that your motherboard is capable of supporting it. Be sure also that the cable you're using to connect the hard drive is of the right standard – it's no use, after all, connecting a SATA III capable storage drive to a SATA III capable motherboard if you're going to do so using a SATA II cable.

## Case

Unless you're planning to leave your motherboard exposed, you'll need to install it into a suitable case. Such a case should be large enough to accommodate all of your components, ideally with room to spare.

Over the years, graphics cards have swollen in size, and some of the current generation dwarf those of just a decade ago. For this reason, it's important to get a big case. This is especially so if you're thinking of investing in multiple graphics cards.

It's important to note that once you've gotten all of the components installed, you'll still need to supply them with power. If your case is stuffed to bursting, then there will be no room for airflow across your PC. The end result of this will be a lack of cooling, and a shortened lifespan for your machine.

## Operating System

Naturally, we'll need to install an operating system on our computer. Existing users of Windows 7 and 8 in 2016 would have received a free upgrade to 10. If you haven't any copy of windows to upgrade, then you'll need to get one.

## Peripherals

There's no use in having a monster of a PC if you don't have a means of controlling it. For both gaming and day-to-day use, this means comes in the form of the time-tested combination, the keyboard and mouse.

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## Keyboard

It might be tempting, when building a computer, to invest in the cheapest keyboard possible, and divert the money you save toward something more useful, like the graphics card. But hold on – not all keyboards are created alike, and at the higher end of the market you'll find some worthwhile features.

In the main, keyboards come in two different forms.

### Rubber Dome

If you use a standard office keyboard, then the chances are that it will be a rubber dome sort. The keys on these boards consist of a plastic cap mounted atop a rubber membrane, which will deform under pressure, and spring upward when released. At the bottom of each dome is a contact, which will complete the circuit below when the key is depressed. These sorts of keyboard are far cheaper than their counterparts, and so represent an attractive option for those building for the first time.

### Mechanical Switches

Mechanical switch keys are rather more complicated. They consist of a plastic cap mounted atop lever arms, a spring, and a plastic plunger which descends to make the circuit. The tactile experience you'll get from using such a keyboard is vastly superior to that which can be obtained through a rubber dome one. Moreover, many models of mechanical switch keyboard are modular, allowing you to replace individual keys in the event that one should break.

Unlike graphics cards, CPUs and memory sticks, keyboard devices are very resilient to Moore's law. You'll be able to play games on them ten, or perhaps even twenty years into the future. For this reason, it's worth investing in a quality keyboard, so that you might enjoy your gaming experience for years to come!

## Mouse

As well as having a decent quality keyboard, a good mouse is imperative. Perhaps even more so, as precise aiming and responsiveness can, in many games, spell the difference between victory and defeat. The accuracy of a mouse is measured in DPI (dots per square inch), with higher numbers signifying higher sensitivities. More advanced mice can also be adjusted in size, allowing you to obtain a comfortable fit for your hand. Some even come with special compartments, where you can load weights, allowing you to aim that sniper rifle with the required inertia!

## Display

Finally, you'll need a monitor to display the image on. As you might imagine, this is among the most important components, and its quality will greatly effect that of your final experience.

In considering your monitor, you'll need to account for a number of factors. These include the resolution, viewing angle, refresh rate and size. The resolution of a monitor is something of a double-edged sword – higher resolutions will mean that more pixels must be calculated, which will place a greater strain on your graphics card, which will in turn mean a drop in frame rate. Your choice of monitor will thereby have a knock-on effect on the price of the rest of our computer.



If you're looking for a smooth experience, then you'll want a monitor whose refresh rate can synchronise with the frames coming out of the graphics card. This will reduce 'tearing' effects. Nvidia's version of this technology is called 'gsync', while AMD's is called 'freesync'. Such monitors will cost a little extra, but the expense is more than worthwhile.

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