**How to build a computer**

Step by step instructions for everybody

**It's easier than you think...**

I think the number one question I get asked when someone is thinking about building their own computer is..."Is it hard?" I really like that I get to say ***"No, it's mostly all plug in and power on!!"*** Once you understand what the different components are for and have a slight idea of how they work your golden!! There is almost nothing complicated about building a computer. I have even helped my mother build one (and that's saying a lot...)

**Planning your computer build...**

Building a computer does however take a little work, most of which is planning. The first thing I ask my customer is "What's your budget?". Please understand that while you will save a ***HUGE*** amount of money by building your own computer (especially a gaming computer), you are still going to spend some money if you want a competitive gaming computer. An awesome gaming computer that will be competitive for a few years and future proof for many many years can be built for $1,250-$2,500. While gaming computers are a little spendy, you can still build one hell of a computer in the $750-$1,000 range that will still be consider "future proof" for quite a few years. If alls you do is play games on Facebook, watch Youtube videos and cruise the information highway, then a budget of $350-$500 is more than enough to keep you happy for many years. Once you have decided what your computer build budget will be you can pick one of the featured builds below, or, read them all and mix and match the parts for the perfect computer for you!! I have selected 8-10 builds for Intel CPU lovers and 8-10 builds for AMD lovers. If you don't have a favorite I would suggest going with the AMD builds. They are cheaper and you definitely get more bang for your buck, especially when it comes to CPU's and GPU's (graphic cards).

**Parts Rundown**

For the complete build sheets, check the next section below titled "desktop builds". Just for a super quick reference of the parts you will need to build your own computer as well as the installation information for each part, click the corasponding linK from the list below:

* **Case**
* **Motherboard**
* **CPU (Processor)**
* **CPU Cooler**
* **Ram**
* **HDD/SSD or both**
* **Power Supply**
* **GPU (graphics card)**
* **DVD/CD Drive**

After you have collected, amassed, hoarded and bartered to get your computer build components, it is time to make sure you have an adequate workspace free of debris and junk to work in. The kitchen table is usually best, but a counter will do just fine in most cases if there is enough light. The only tools you are going to need will be a small screw driver set. You may even be able to get away with just one small Phillips screw driver.

**Assembling Your New Computer**

The first thing we do is open our computer case. Each case has a manual that comes with it, and I have never encountered one that took more than 2 minutes to glance at to figure out how to take the case apart. Most of them include very detailed views of the inside of the case, something that is incredibly helpful when you are trying to assemble your computer inside the case. The most interesting thing about assembling a computer is that much of it really is plug-and-play, unless something goes wrong, and then usually it’s only a minor setback. By looking through the manual, you will quickly get an idea of where everything should go, but there are a few things that you need to be careful of when going through the manual.

**Installing the Motherboard**

Installing the motherboard into the case is the first part of the computer installation process. This is because it is the central hub for your computer, so it’s important that you get it in first, as many of the other parts that you have will connect to it. You can try inserting it later, but it can be very difficult when anything else is already taking up room in the case.

When you take out your motherboard, you will immediately notice that it is one of a few types and sizes. You will see a few different specifications that you want to pay specific attention to at this stage of the game:

* **Processor Classification:** The classification of the motherboard refers to the type of processor that it’s made for. Basically you need to have the right motherboard/processor combination; otherwise you will run into problems.
* **Size:** You may see things like ATX, Micro-ATX, or Full-AT on the box for the motherboard. These are all descriptions of the size of the motherboard, and you will need to have one that matches up with your case (ATX to ATX for example). Smaller/larger motherboards generally won’t work with smaller/larger cases.

Let’s assume that all of the above makes sense, and that you’ve determined that all your components will fit together correctly.

Installing the motherboard is relatively simple. You find the part of the case that the motherboard will be attached to, and use one of the screwdrivers in your toolkit to screw it in. In case you don’t know where the motherboard will be attached, or it isn’t immediately obvious, your manual will help you through this step.

**Installing the Panel Connectors**

I like to install these next, it gets a little tricky if you wait till the case is full. The panel connectors are the small wires that come out of the front panel of your case. These include things like the power light and sometimes a few other notification lights on your computer. There is no universal rule about where to put these pins, so you will have to consult the motherboard’s manual (yes, another manual) to figure out the proper spot for them.

**Installing the Processor**

You’ve already installed and connected something to your motherboard, but even if you connected the rest of the things in your case, your computer still wouldn’t work. To make your computer actually able to compute things, the next step will be installing the processor.

The first step is simply finding the place that the processor goes, which is generally pretty easy. You will see a large square area that is generally centrally located on your motherboard, but if you don’t see it right away remember that the motherboard’s manual will show you where it is.

Once you’ve located it, take your processor and insert it down into that square depression. The corner with the fewest pins will go into the upper right corner of the socket, and be sure to be careful when installing the processor, as the pins can bend easily.

If your motherboard has a latch next to the CPU socket, make sure to push that down when your motherboard is properly seated.

**Installing the CPU Cooler**

For this we have two options, solid or fin CPU coolers, and liquid coolers. Solid coolers use metal fins to transfer heat away from the computer processor and disperse it into the case, to be carried away by fans. Liquid coolers will also disperse heat, but they do so by running fluid near the processor that is carried away after it heats up.

Solid/fin/stock CPU coolers

Solid coolers transfer heat away from the processor by using a heat-conductive material to distribute the heat from the processor to the cooler. Heat will transfer to the cooler until it is the same temperature as the processor. This will almost never occur, as the cooler is generally connected to a fan that pushes the heat away from the cooler and cools *it* down, allowing it to take more heat away from the processor.

Fin coolers are the most popular type of solid CPU cooler, and they look like a number of metal fins that stick to the top of your processor. This CPU cooler works well because there is more surface area exposed on the cooler, allowing the fans to more easily pull heat away from the cooler, thereby pulling heat from the processor.

To install this type of cooler, you will generally apply a paste onto the back of the processor. This paste will not only help you stick the CPU cooler to the CPU, but it will also transfer heat between the cooler and the CPU, and work even at high temperatures.

Once the paste has been applied, the next step is to stick the CPU cooler onto the CPU. After a few minutes, the paste will work to solidify that connection.

Aftermarket liquid CPU coolers are a whole other animal. These coolers use a small amount of liquid to more quickly pull heat away from the CPU, helping to cool the processor down even faster. Installing them is a bit trickier, as they aren’t just a simple fan. The liquid cooler will generally have two parts to it. One part will fit on top of the processor and draw heat from the processor into the tube containing the liquid coolant. This part will need to be screwed on top of the processor, and the manual will show you just how to do that.

The second part of the liquid cooling rig is the radiator, which will generally have to be placed farther away from the processor to better distribute the heat that it throws off. This should be screwed into the case, and the manual for the case will give you places where you can put this.

**Installing the RAM**

There are a few different types of RAM that you’ll likely be working with. You might see everything from DDR2 (an older type of ram) to DDR3 (common) to DDR4 (next-gen). The higher you go, the faster you get, which ultimately will make your computer more responsive. Aside from the DDR version that you get, you will also have to choose an amount of RAM to get. This can range in sizes from a few megabytes or gigabytes to hundreds of gigabytes, although your motherboard will probably have a maximum that it can utilize. On top of your motherboard’s requirements, you will also have a maximum and minimum that your operating system can use, although it’s likely that the maximum is too high for you to conceivably hit if you are running a current OS.

Installing the RAM is very simple. To do so, you want to pull the RAM out of it’s case, locate the slot on the motherboard where you need to put it, and stick it in. There is a tab on either side of the slot that you will have to close in order to keep the RAM locked in it’s slot, so make sure to do so before going on to the next part.

If you can’t find the place to install the RAM, you can find the location in the motherboard’s manual.

**Installing Graphics Cards**

Installing a graphics card is a little harder than installing the RAM, but not overly difficult either. The graphics card will be the first thing that you install into the case itself that you can interact with from outside the case. Traditionally the placement of the graphics cards has always been at the bottom of the rear of the case, but if you can’t find an opening you may want to consult your case’s manual.

Once you’ve located the slot, the next step is to remove anything that is in the way of the graphics card. Many cases will have plastic dividers that seal up the outside of the case when nothing is in the graphics card slot. If there is one of these in your case, make sure to take it out so that you can put in your graphics card properly.

To put in the graphics card, you’ll want to plug it into the slot provided on the motherboard (if there is more than one, use the top slot). Once the graphics card is properly seated in its port, the next step will be to connect it to the motherboard (seeing a trend here?). This will let it send and receive data from the rest of your computer.

Later on, when you are ready to turn on your computer, you will want to hook up the outside port to your monitor so that you can actually see what’s going on, but until then, the installation of the graphics card is as simple as that!

**Installing the Hard Drives**

If you want to actually install an operating system, you’re going to need a place to put it. Enter the hard drive. Today, you can get two types of hard drives: disc drives and solid state drives. Disc drives are bigger, but they are slower and use more power. Also, they are more prone to failure. Many people now use these drives for storage.

Solid state drives (SSD) are more often used for the hard drive that holds the operating system. The SSD will be faster and make your computer more responsive, but they are generally smaller on a $/GB basis.

The installation of either drive is very simple; all that you need to do is to locate the space where it is going to go (generally a large metal box with an open back), and slide it in. Once it is sitting there comfortably, you’ll want to screw in a few screws to hold the drive in place and plug it into the motherboard (consult your motherboard’s manual for proper placement of the connector).

**Installing DVD/CD Drives**

If you want a DVD/CD drive, it’s very simple to install one. The drive will go into your computer in a very similar way that the hard drive did, but you will need to remove the panel in the front of the case that shields the drive bay. This is relatively simple to do with a flathead screwdriver, and once the panel is off the installation of the drive will be very straightforward.

All that you will have to do is slide the drive into the drive bay, screw it in like you did with the hard drive, and plug it into the motherboard.

**Firing It Up**

This is the biggest part of the procedure, not for the complexity but because it’s the first time that you will test everything in your new computer for the first time. Connect your monitor to the back of your computer in the same place that you plugged in your graphics card. Once you’ve closed up your computer and installed the CD with your operating system, press the power button on the front of the computer and see what happens.

If nothing happens, it’s likely that you have a problem with one of the connections inside your computer. Check to make sure that everything is connected properly and that everything has power running to it, and then try again. If nothing happens after that, you’ll need to consult your motherboard’s manual and begin checking each part of the system one-by-one, as you could have a damaged or faulty component.

**Installing the Operating System**

So you have a working computer? Great, now it’s time to install an operating system and get to work playing with your new toy. Installing an operating system will be relatively simple. If you’ve already put in the CD with your new operating system, then the only step is to run through each of the steps in the installation program and make any changes to the default settings as it’s necessary.

**Common problem areas/errors…**

You may run into problems during this installation, but they aren’t going to be anything too serious. Here are a few problems that you might have:

* I’ve checked everything and nothing is working!
  + You may have a problem with one of the components. Make sure to run through each component, checking them for problems as you go. Most of the time you will get an error on startup that will tell you what’s broken.
* Something is broken/not working, what do I do?
  + Well the first thing to do is to check to see if it’s something that was wrong when you got the part. If so, then you can send it back to the manufacturer for a new part.
* Even though everything is connected properly, my computer isn’t getting power!
  + Did you plug your computer in? Seriously, this is a mistake that many people make, even when they get all the complex stuff taken care of.

**Be sure to check out our FAQ section too!**