Personal Desktop Computer Assembly

Introduction

Most computer users have never thought about assembling their own computer thinking the process is too complicated and/or requires a lot of technical knowledge. The truth is that setting up Ikea furniture can be more complex than assembling your own computer. In fact, the most difficult and fun part of computer assembly is acquiring the computer parts that you will be assembling.

These instructions will not go over selecting computer components since this would depend on the type of computer you would like to build. However, I will list the computer components that are required for a basic general purpose personal computer.

Necessary Components

1x Motherboard

1x Computer Processor (CPU)

1-4x Computer Memory (RAM)

1x Hard Disk Drive (HDD)

1x Computer Case (power supply)

1x Operating System Software

Note: Ensure to select CPU, RAM and HDD compatible with your motherboard.

WARNING

1. Ensure power supply is disconnected during assembly.
2. Do not work on computer assembly without sufficient lighting.
3. Assembly requires lifting heavy objects.

Necessary Tools

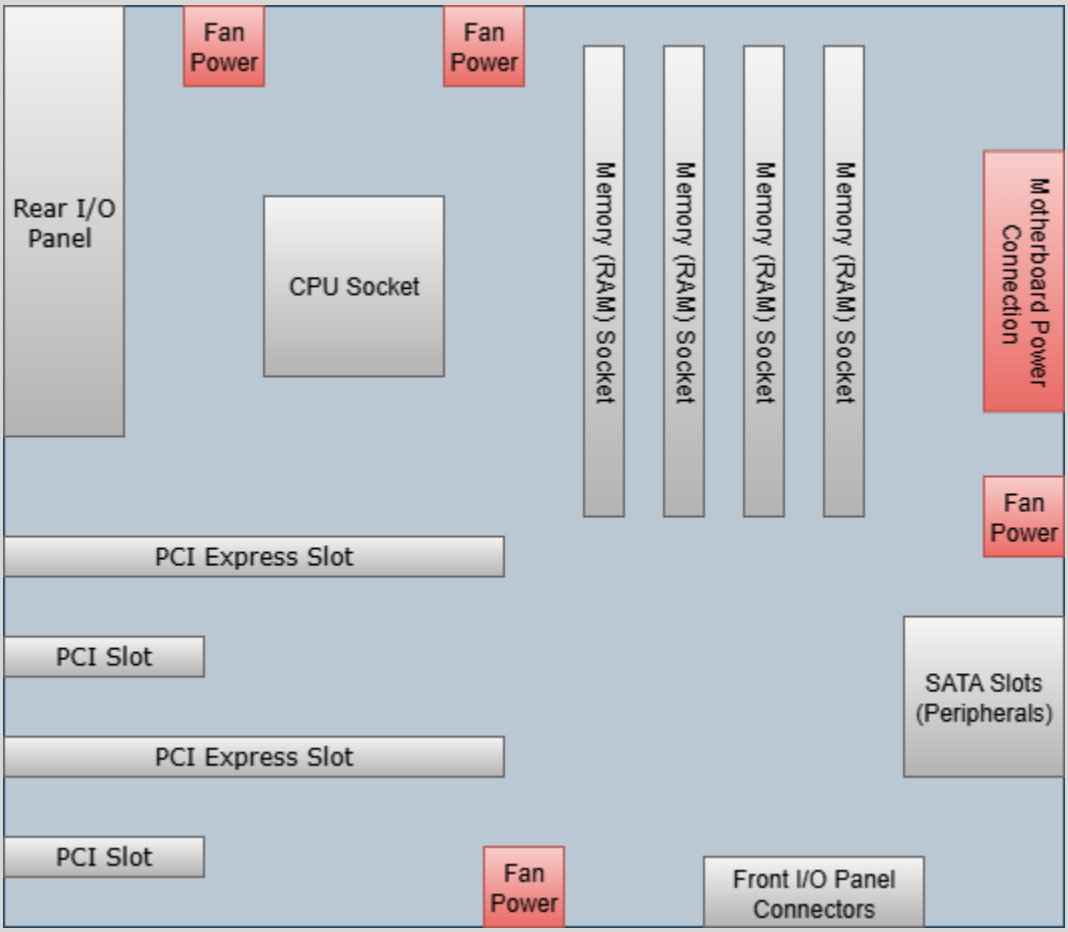
1x Phillips Head Screwdriver

1x Mini Phillips Head Screwdriver

Note: Most computer cases and motherboards will include necessary hardware.

Above: Only tools necessary

Overview of a Motherboard



- Prior to starting the assembly of your personal computer (PC), you will want to get familiar with the important components of a motherboard.
- The most important components in the motherboard will be the CPU Socket, Memory (RAM) Sockets, SATA Connection ports and power connection sockets.
- Front Panel Input/Output Connection ports will be detailed in your motherboard instruction manual since these can be very specific to motherboards.
- PCI Slots are not necessary for this build since most motherboards come with integrated graphics, therefore, we will not be installing a graphics card.

During assembly instructions, I will identify these on a real motherboard to ease identification.

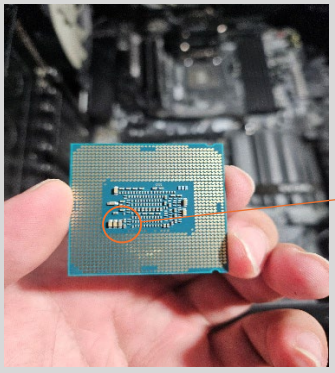
Assembly Steps

Attach motherboard to Computer Case

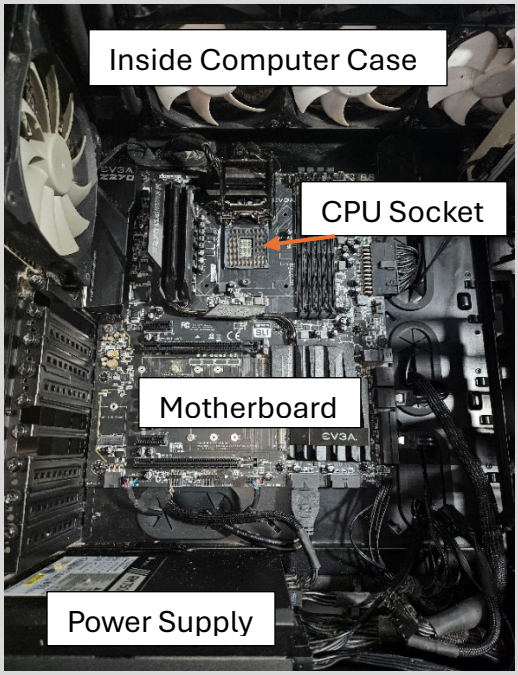
- The first step should be installing the motherboard to the computer case.
- For this step, ensure the computer case is laying on a flat surface with the opening where the PC components will be installed facing upwards.
- Install the motherboard to the computer case as instructed by your motherboard instruction manual. This step usually involves screwing spacers on the case, followed by placing the mother board on top and finally securing the motherboard to the case with screws.

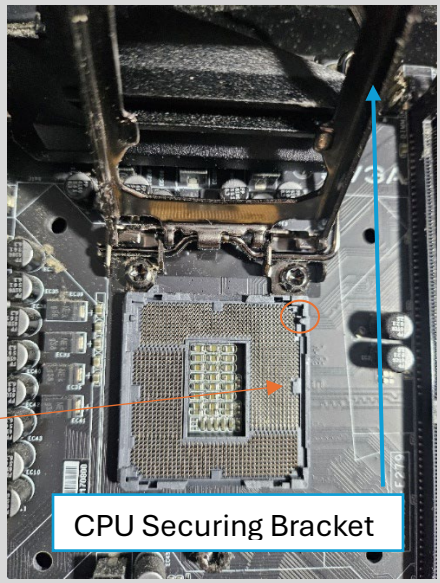
Insert CPU to CPU Socket on motherboard

- When inserting CPU to motherboard, ensure you hold the CPU by the edges.



- Open the CPU socket securing bracket and insert the CPU into the socket with the simple side facing up and the complex looking circuitry facing down into the motherboard.
- A notch will disallow free fitting.





Above: Plastic notch which will dictate fit.

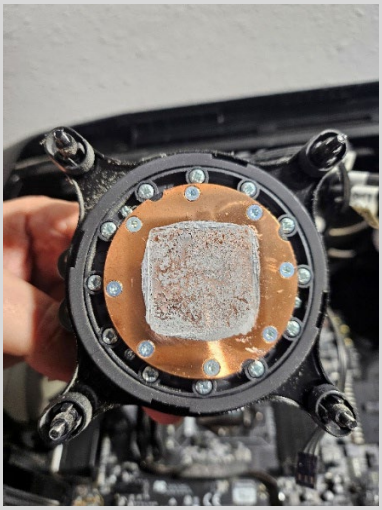
Secure CPU to socket

- Lower the CPU securing bracket.
- Do not worry about damaging the CPU while lowering the bracket. It will seem like you are adding too much pressure. It is designed this way.

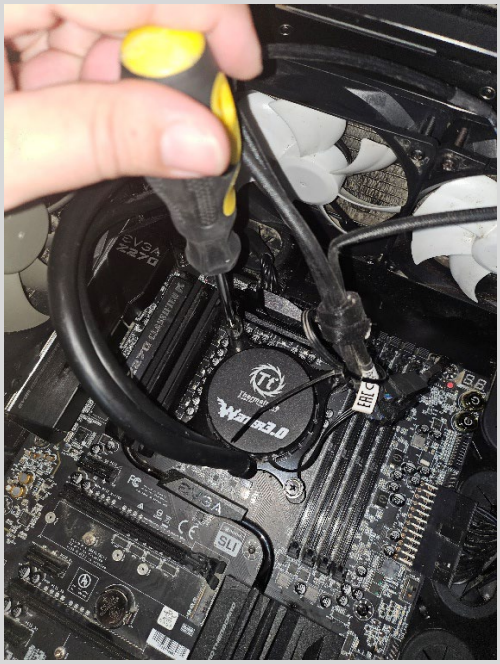
Above: Secured CPU

Install cooling system included with CPU

- Most CPU's come with small heat sinks that are designed to keep the CPU cool under operational conditions.
- Also, CPU's will come with thermal paste already applied on the heat sink. Thermal paste is a medium that is applied in between the heat sink and CPU.



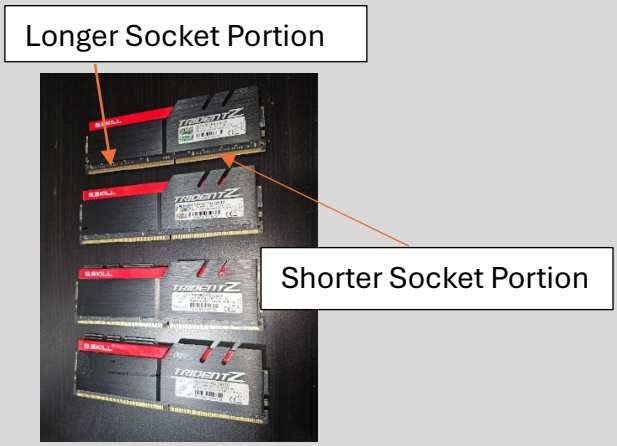
Above: Thermal paste on heat sink.



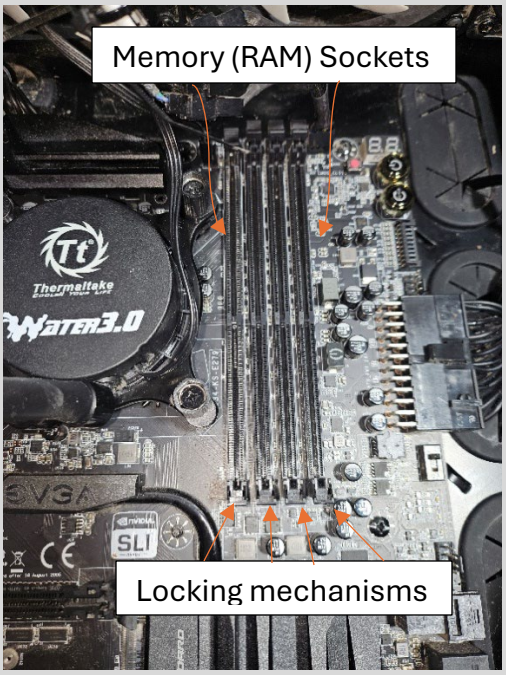
Above: attach heat sink with screws.

Insert Computer Memory into Sockets

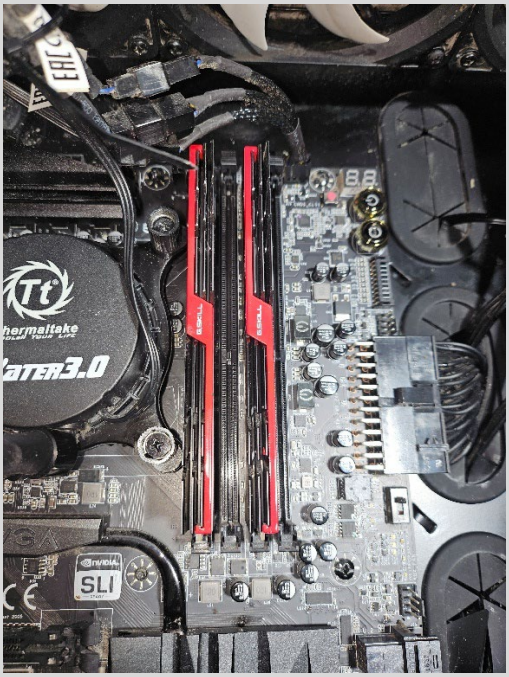
- Ensure that you open the small locking mechanisms on the motherboard RAM sockets before inserting the memory.
- Make sure that you are inserting them correctly, one side of the part of the RAM that needs to be inserted is shorter than the other.
- Insert the memory until it locks into place, the locking mechanism should lock into place if inserted properly.
- Most likely the RAM you bought is Dual Channel. If you only purchased two of them, don't insert them next to each other, have an empty slot in between them. (4 slots in most motherboards)



Above: Computer Memory (RAM)



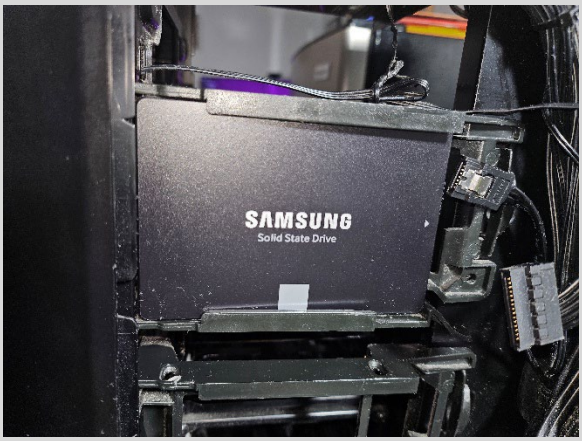
Above: RAM Sockets on Motherboard



Above: Memory installed (Dual Channel)

Install Hard Drive Disk

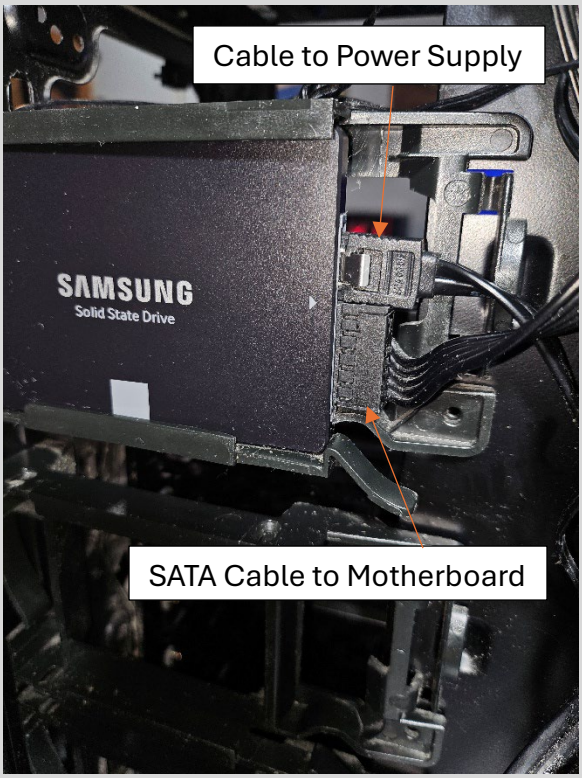
- Slide the hard drive into a hard drive bracket, securing with 1 or 2 screws (provided with case).



Above: Hard Drive inserted into bracket.

- Insert a SATA cable between the mother board and the hard drive. You should plug the SATA cable into the lowest numbered SATA connection on the motherboard (there are several).

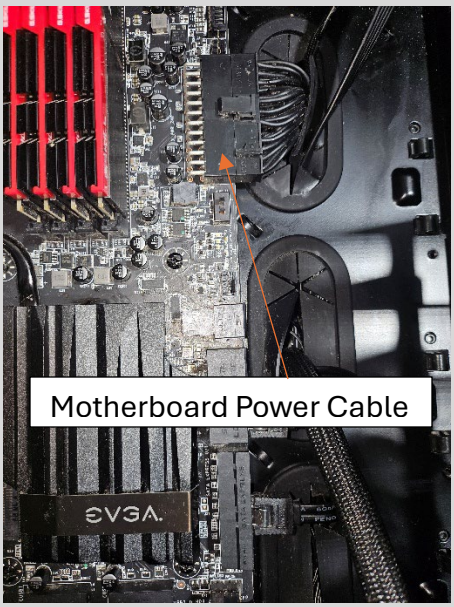
- Connect the hard drive to the power supply. (cables are included with power supply).



Above: Hard Drive cables connected.

Connect to Power

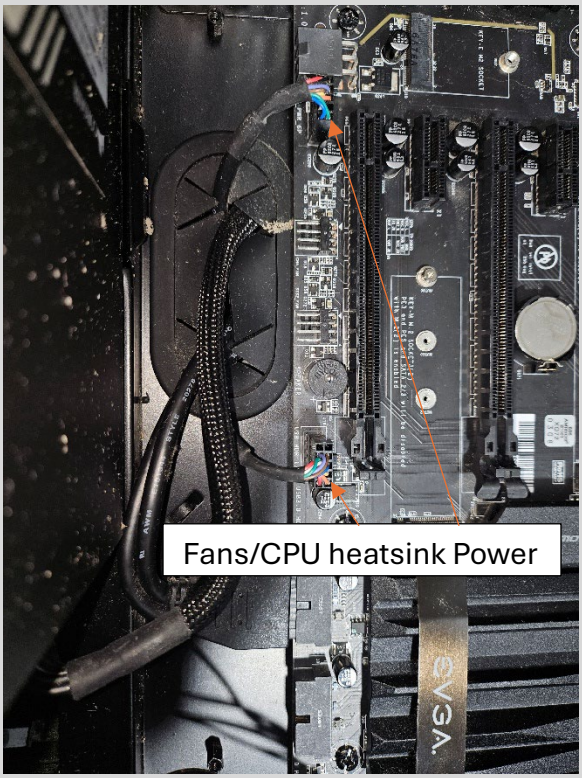
- Connect the power supply to the motherboard using the large power supply cable. (it should be marked)



Above: Motherboard connected to power supply.

- Manage the cables how you wish, most computer cases have an area to route and hide cables in a section of the computer case behind the motherboard.

- Connect all the computer case fans to the motherboard. The CPU cooler/heatsink will also connect to a fan power connector on the motherboard.



Above: Fans connected to power supply.

- In order to connect the front panel input/output cables from the computer case to the motherboard, you will need to follow the instructions included with the motherboard.

Completion

Finishing Touches

- At this point, we are done assembling the computer, all we need to do hardware wise, is to tuck all the cables neatly, ensure we connected everything right and close the computer case.

- You will also need to connect computer peripherals like a mouse, keyboard, speakers and anything else you desire.
- However, all we have now is an assembled PC that can't really do anything until we install an operating system.
- You will have to refer to the instructions for the specific operating system you wish to install on your PC. Nowadays, operating systems come in USB sticks which I recommend so that you will not need to purchase a CD drive. All Computer cases come with USB ports.

Conclusion

After following these instructions, I hope you are able to at least have a good idea about the process involved with assembling your own computer. You can expect to feel a lot of uncertainty up until you finally see your brand new self-assembled PC running smoothly.