



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

**SCHOOL OF COMPUTING**  
Faculty of Engineering

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Subject : Technology and Information Systems (SECP1513)

Section : 10

Assignment : Step by step PC Assembly

### GROUP NAME / NUMBER : 8

|   |                                                                                     |                                                                                                                                                              |
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**PART A – List at least FOUR tools needed to assemble a PC. For each tool, Provide picture(s), explanations of its functions and its importance.**

## 1.0 Screwdrivers



The Phillips-head screwdrivers are helpful to avoid stripping the head, a long shaft also aids in keeping the handle out of the way when working in tight spaces. It is important due to computers being held together with screws and, luckily, nearly all types of screws used in computers are Phillips-head.

The flat-bladed screwdrivers usually aren't much use for unscrewing anything, but they're great for getting extra leverage and prying things apart (but only if there's no

better way to access your objective). It is important to disassemble a laptop that often requires thin “ice pick” flat-bladed screwdrivers to separate the plastic housing.

## 2.0 Zip or Twist Ties



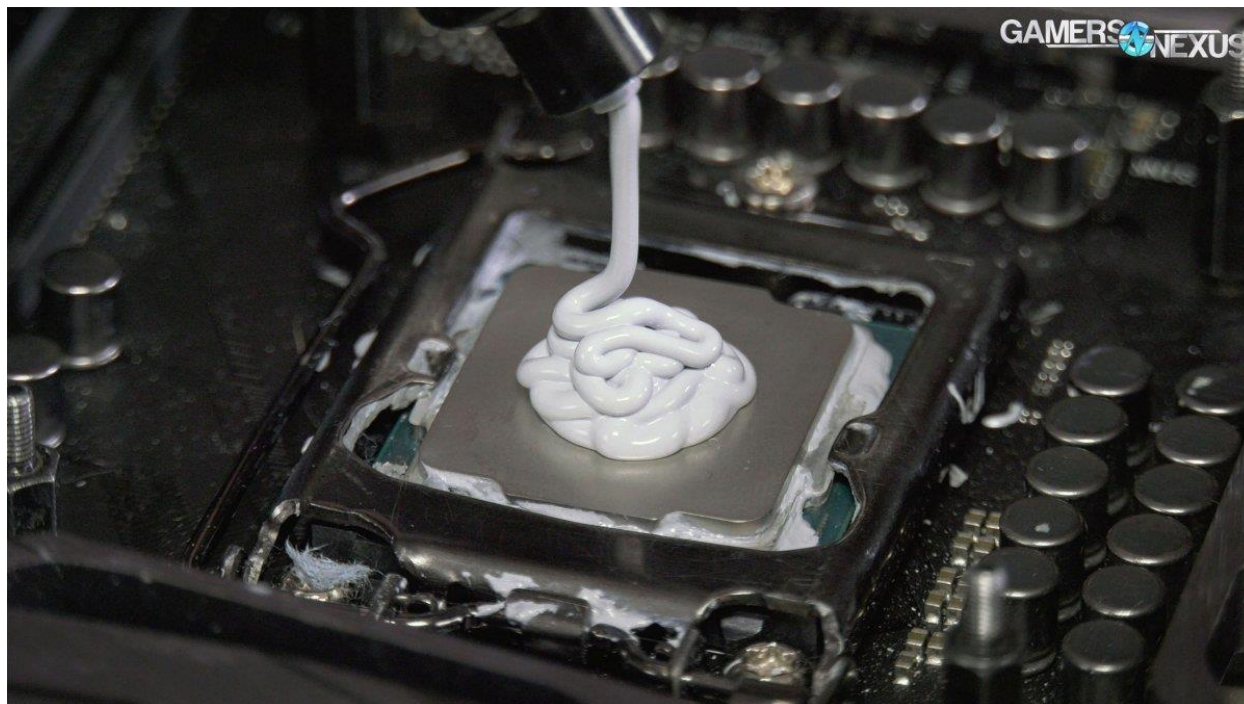
Zip ties are the best way to keep cables in place, but they’re also only good for a single use. Cables that might be moved around in the future can be tidied-up with black twist ties, which are practically invisible, nearly as secure, and far easier to remove. There are two importances of zip or twist ties which will make it easier to work in the case. Second, it can actually help in the airflow inside the computer.

### 3.0 Headlamp



Headlamp will always point in the right direction, and it doesn't require an extra hand to hold it. It is important due to the PC cases being full of shadows, and screws love to roll into the darkest corners.

#### 4.0 Thermal Paste



Thermal paste significantly increases the heat sink's ability to cool the CPU, allowing the CPU to run at a higher speed and improve system performance. It is important to fill the microscopic gaps between a computer's CPU and its heat sink.

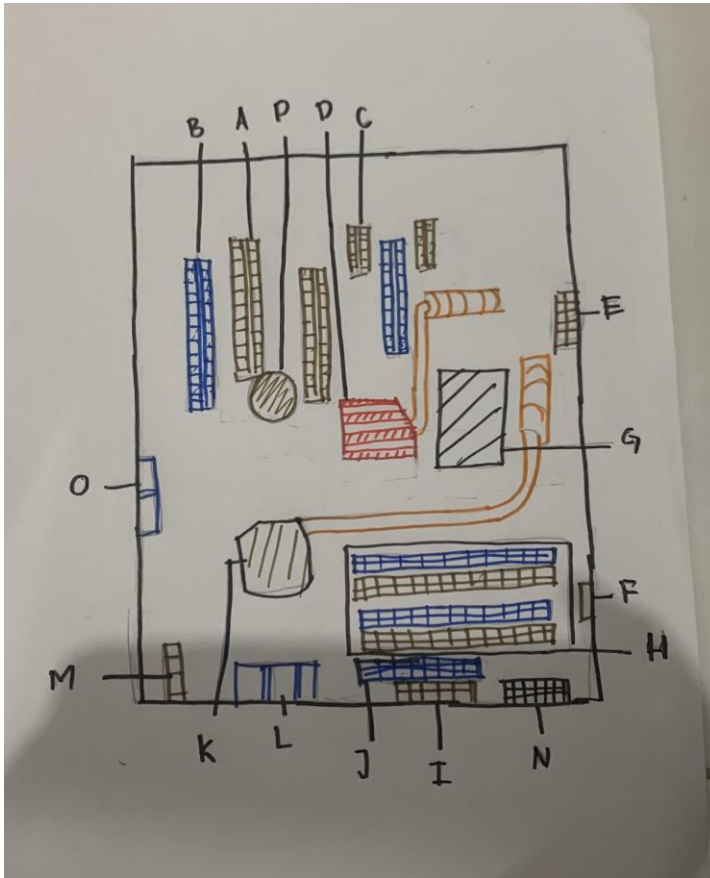
## 5.0 Pliers



Needle nose pliers have a wide variety of uses, and they often include a wire cutter, which can be used to snip the excess off of cable ties. It is also important when sometimes the heads of cheap screws get stripped and sometimes the only option is to use a pair of pliers (carefully).

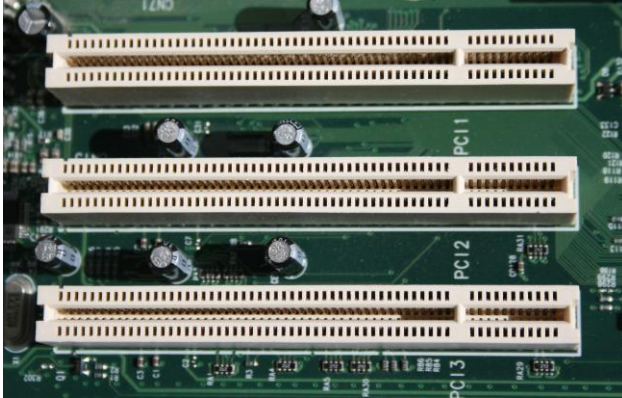
## PART B – Sketch of a mother board layout

### 1.0. Sketch of Motherboard layout



## 2.0. Pictures, explanations of its functions and example of each label

### A. *PCI Slot*



This board has 2 PCI slots. These can be used for components such as Ethernet cards, sound cards, and modems.

### B. *PCI-E 16x Slot*



There are 2 of them on this motherboard diagram, both are blue. These are used for your graphic card. With two of them onboard, you can run 2 graphics cards in SLI. You would only need this if you are a gamer, or working with high end video / graphics editing. These are the 16x speed versions, which are currently the fastest.



### C. *PCI-E 1x Slot*



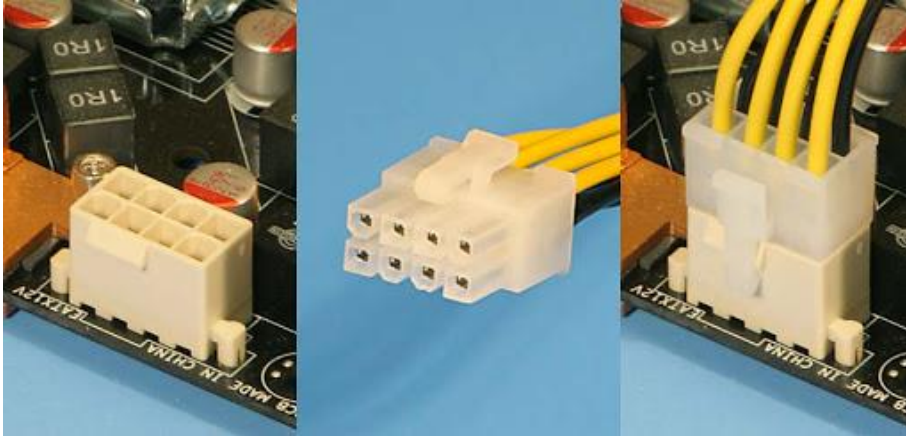
Single slot - In the PCIe 1.x generation, each lane (1x) carries 250 MB/s compared to 133 MB/s for the PCI slots. These can be used for expansion cards such as Sound Cards, or Ethernet Cards.

### D. Northbridge



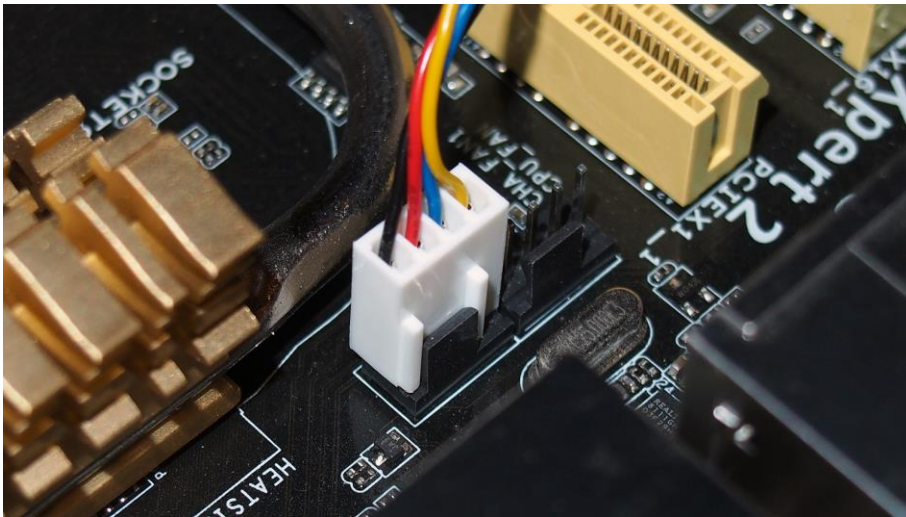
This is the Northbridge for this motherboard. This allows communication between the CPU and the system memory and PCI-E slots.

### E. *ATX 12V 2X and 4 Pin Power Connection*



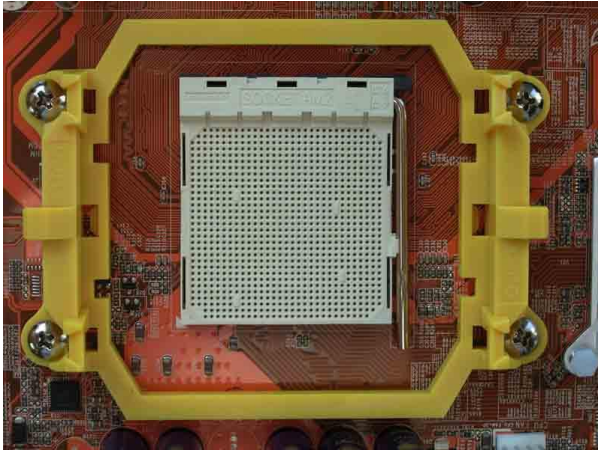
Power Connection - This is one of two power connections that supply power to the motherboard. This connection will come from your Power Supply.

#### F. **CPU-Fan** Connection



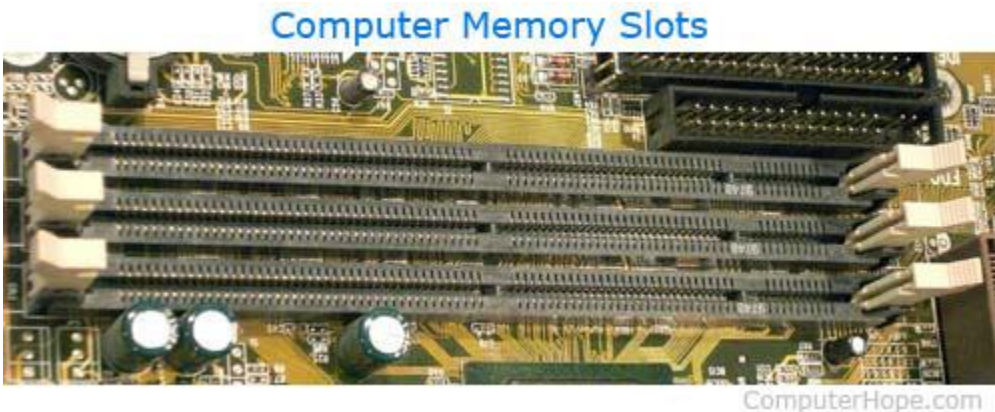
This is where your CPU fan will connect. Using this connection over one from your power supply will allow the motherboard to control the speed of your fan, based on the CPU temperature.

#### G. **Socket**



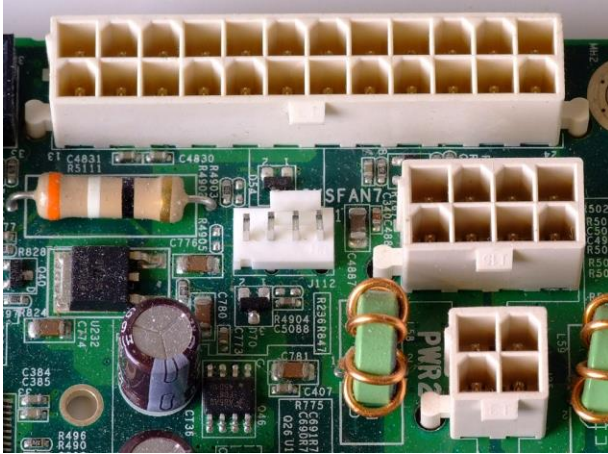
This is where your CPU will plug in. The orange bracket that is surrounding it is used for high end heat sinks. It helps to support the weight of the heat sink.

#### H. Memory slot



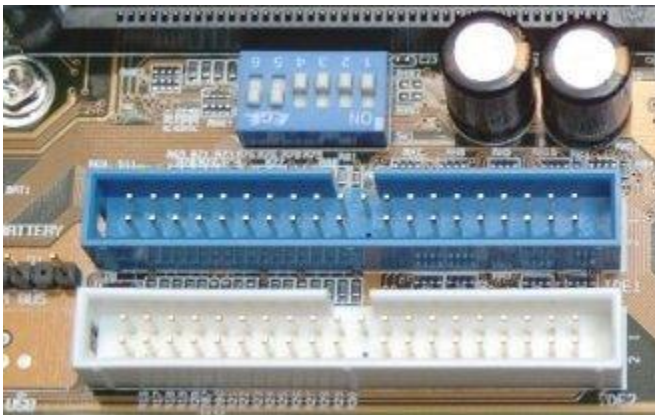
These are the slots for your RAM. Most boards will have 4 slots, but some will only have 2. The color coding you see on the motherboard diagram is used to match up RAM for Dual-Channel. Using them this way will give your memory a speed boost.

#### I. *ATX Power Connector*



This is the second of two power connections. This is the main power connection for the motherboard, and comes from the Power Supply.

#### J. *IDE Connection*



The IDE (Integrated Drive Electronics) is the connection for your hard drive or CD / DVD drive. Most drives today come with SATA connections, so you may not use this.

#### K. Southbridge





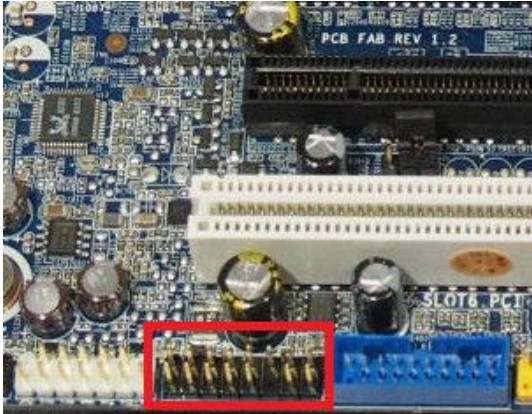
This is the controller for components such as the PCI slots, onboard audio, and USB connections.

#### L. ***SATA Connections***



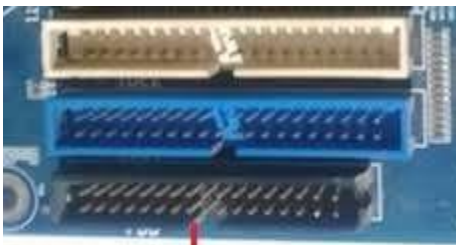
These are 4 of the 6 SATA connections on the motherboard. These will be used for hard drives, and CD/DVD drives.

#### M. ***Front Panel Connections***



this is where you will hook in the connections from your case. These are mostly the different lights on your case, such as power on, hard drive activity etc.

#### N. *FDD Connection*



34-pin connector for FDD

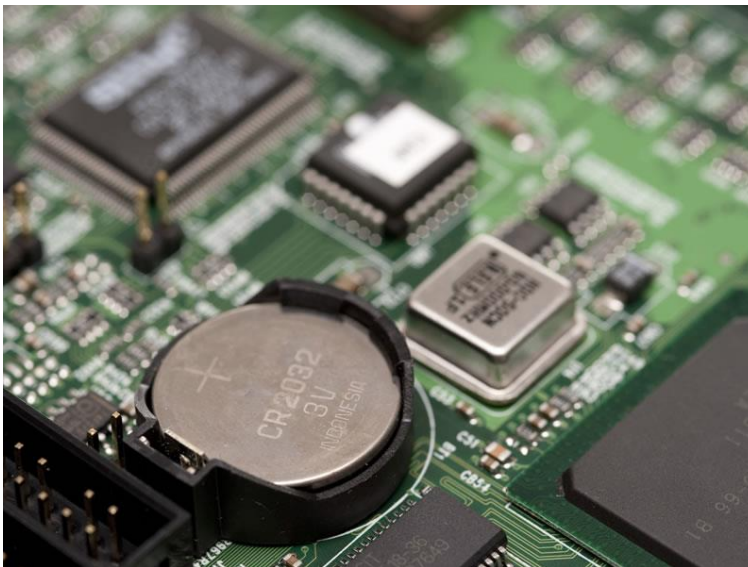
The FDD is the Floppy Disk controller. If you have a floppy disk drive in your computer, this is where you will hook it up.

#### O. *External USB Connections*



This is where you will plug in external USB connections for your case or USB bracket.

#### P. CMOS Battery

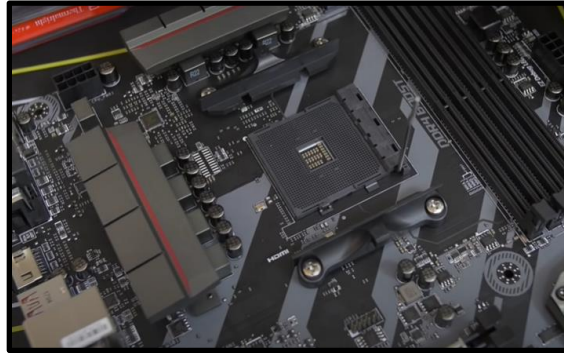


This is the motherboard's battery. This is used to allow the CMOS to keep its settings.

## **PART C - “Step by Step PC Assembly”**

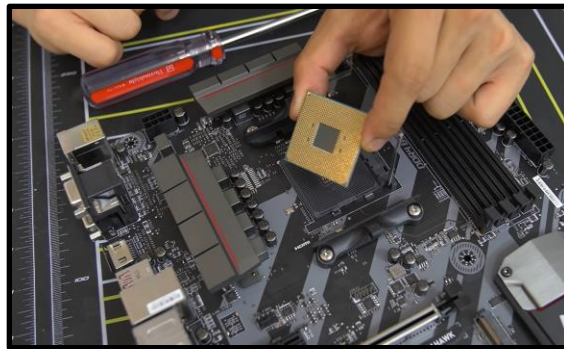
### Step 1 - CPU installation

- Lift up the bar of the CPU socket



Picture 3.1 CPU socket

- During the installation, make sure to grab the edges of the CPU and DO NOT touch the golden pins on the bottom of the CPU.



Picture 3.2 CPU golden pins

- Insert the CPU into the CPU socket. Ensure that the golden pins of the CPU are slutting into the holes of the CPU socket. Then, lift back down the bar of the CPU socket to nicely tighten up the CPU.

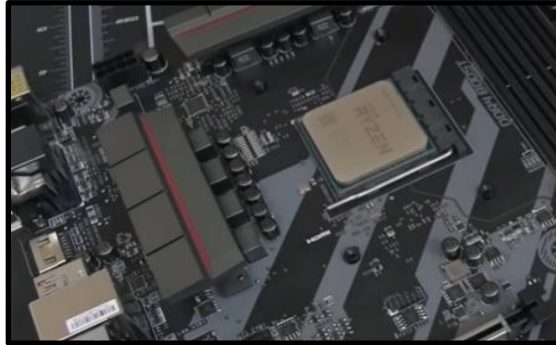


Picture 3.3 CPU installation



## Step 2 - CPU Cooler Installation

- Before installing the CPU Cooler, unscrew each of the two screws on the either sides.



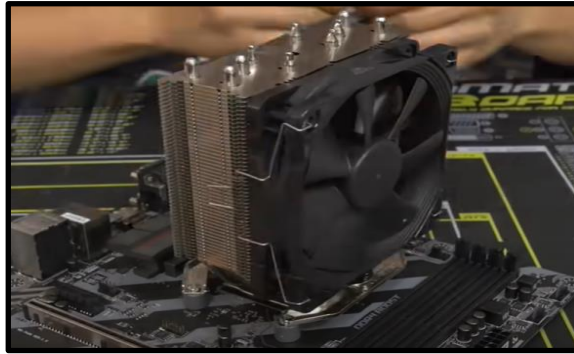
Picture 3.4 Unscrew the sides

- Make sure to always apply a thermal paste during the installation of the CPU cooler to significantly increase the heat sink's ability to cool the CPU, allowing the CPU to run at a higher speed and improve system performance. When applying a thermal paste, simply squeeze out a grain of rice size onto the middle of the CPU.



Picture 3.5 Apply a thermal paste

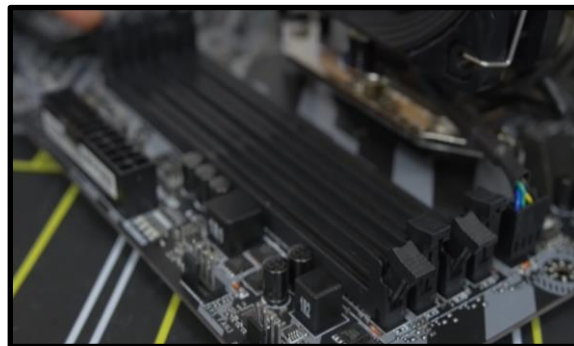
- Then, install the CPU cooler and heat sink nicely and tidy.



Picture 3.6 Install CPU cooler and heat sink

### Step 3 - RAM Installation

- Check carefully as each RAM has its own particular dimm slot. After deciding the position, pull down the side latch of the dimm slot where it will be the installation of RAM.



Picture 3.7 Pull down the side latch

- Then, apply force downward on the RAM into the dimm slot until both the side latch that we pull down earlier, snap back into place.



Picture 3.8 Install RAM

#### Step 4 - Prepping the Case

- Take off both the side panel of the CPU cabinet. When taking off the side panel, it is advisable that do not peel off the plastic wrap until the whole building is done as the side panel might be scratched if you do so.



Picture 3.9 CPU cabinet



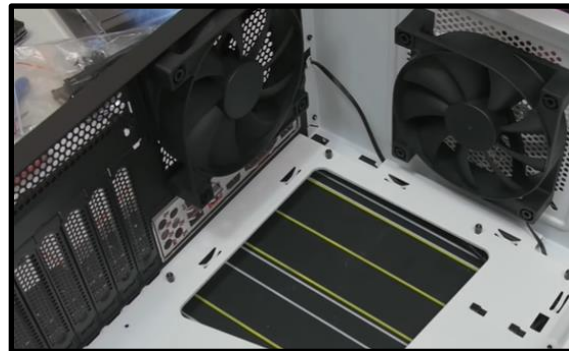
Picture 3.10 Remove side panel

#### Step 5 - Motherboard Installation

- Before installing the motherboard into the CPU cabinet, attach the motherboard io shield at the side of the CPU cabinet.



Picture 3.11 Motherboard io shield



Picture 3.12 Inside look of CPU cabinet

- After done attach the motherboard io shield, install the motherboard into the CPU cabinet by fitting the port nicely all over the motherboard io shield.



Picture 3.13 Fitting the port on motherboard io shield



Picture 3.14 Install motherboard

#### Step 6 - Power Supply Installation

- It is recommended to install the power supply with the fan facing downward if there is a ventilation slot at the bottom of the CPU cabinet. When installing the power supply, group the massive cables together, and push them through the CPU cabinet. Then, screw up the power supply tightly.



Picture 3.15 Ventilation slot



Picture 3.16 Install power supply

## Step 7 - Connect Front Panel Connectors to the Motherboard

- The CPU cabinet itself contains front panel connectors which are responsible for power button, reset button, USB port, audio jack, etc.. Route all of the panel connectors through the various cutouts in the CPU cabinet. Note that always route each of the connectors through the cutout closest to its appropriate header in the motherboard.



Picture 3.17 Front panel connectors



Picture 3.18 Route panel connectors through cutouts in CPU cutouts

- Then, connect each of the connectors to the motherboard carefully and accurately.



Picture 3.19 Connect connectors to the motherboard



### Step 8 - Fans Installation

- Some of the CPU cabinets have their own built up fan slot in it, while others don't. Skip this step if the CPU cabinet does not have any fan slot.
- Simply install the fans on the fan slot given, and connect the connector to the motherboard.



Picture 3.20 Install fans (optional)

### Step 9 - Hard disk & SSDs installation

- Install the hard disk in the only drive cage in the CPU cabinet. Mount the hard disk, and screw it up tightly. If the hard disk is not mounted properly and securely in the CPU cabinet, then all the moving parts will make a lot of vibration and noise which is quite unsettling.



Picture 3.21 Drive cage



Picture 3.22 Install hard disk

- Then, for the first slot, connect the SATA cable from ur power supply to the hard disk. For the second slot, connect it with the cable provided to the SATA ports on the motherboard. Note that the cable for the second slot is provided together with the motherboard which can be used to connect either hard disk or SSDs.



Picture 3.23 Connect SATA cables from motherboard



Picture 3.24 SATA port at motherboard and power supply

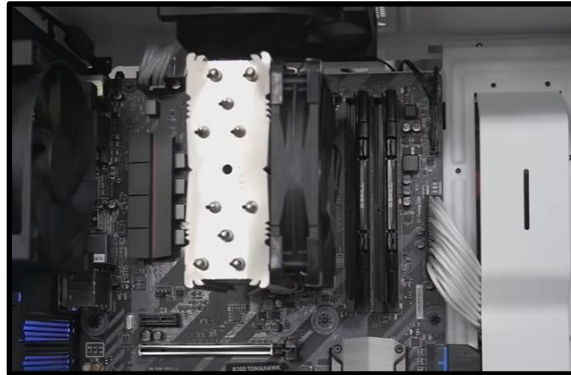
- For the SSDs, connect the other cable between motherboard and the SSDs.



Picture 3.25 Install SSDs

#### Step 10 - Plug in Power Cables (IDE cables)

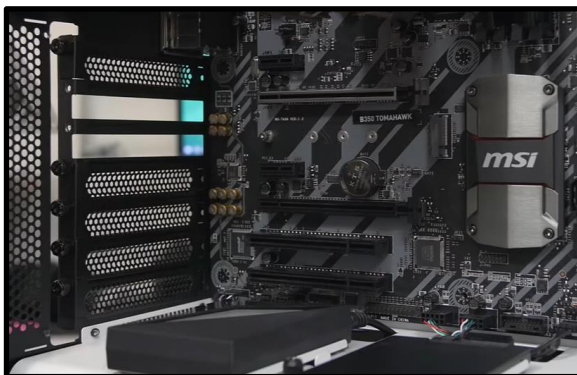
1. There are various types of IDE cables, and in this case, which are 24 pins and 8 pins. Connect 2 of them into the respective motherboard.



Picture 3.26 Plug in power cables

#### Step 11 - Graphics Card Installation

- Pull down the latch, then install the graphics card and also the IDE cable.



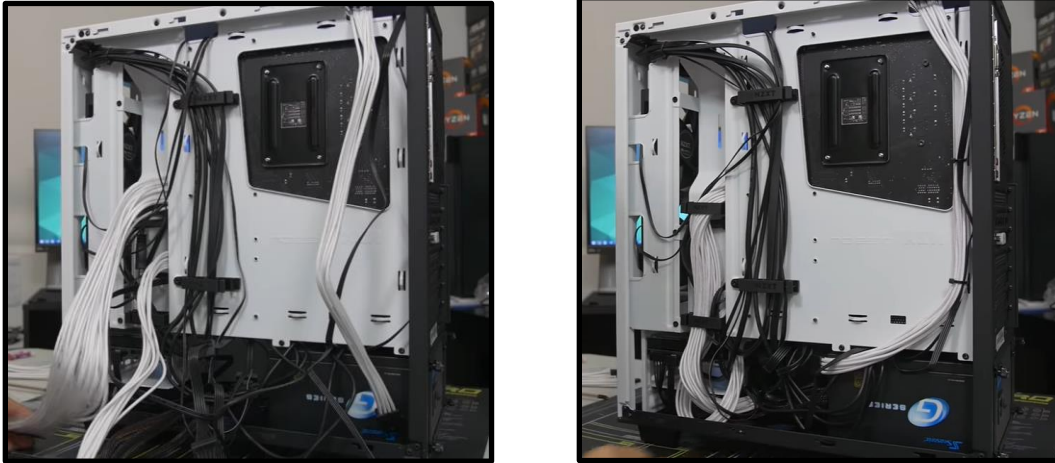
Picture 3.27 Pull down the latch



Picture 3.28 Install graphics card and IDE cable

## Step 12 - Cable Management

- The cable management, which is the last step, tidy up all the cable using zip ties and we are all done!



Picture 3.28 Cable management

## Last Step - Closing the Case and Connecting the Peripherals

- Place the side cover back on and secure the side panels with case screws.



Picture 3.29 Full look of the PC

- Connect peripheral devices which include keyboard, mouse, wireless network dongle, printer and webcam with your CPU by plugging into USB plug.



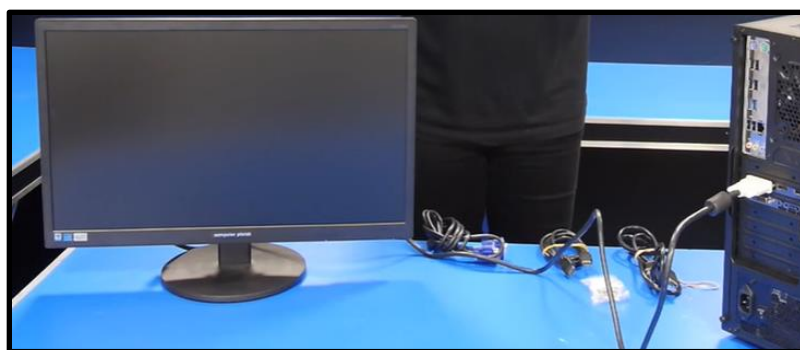
Picture 3.30 Plugging peripheral device into USB plug

- Then, connect speakers and microphone into 2.5mm sockets.



Picture 3.31 Plug in speakers into 2.5mm sockets

- Finally connect the CPU with monitor by plugging into display ports



Picture 3.32 Connect CPU with monitor