UTM UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

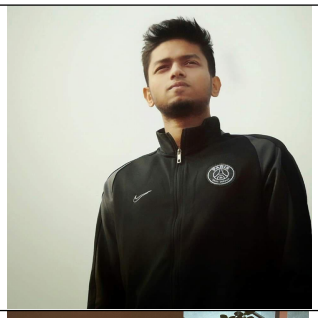
Semester I 2020/2021

Subject : Technology and Information Systems (SECP1513)

Section : 05

Assignment : Step by step PC Assembly

GROUP NAME / NUMBER : 2

1		Name : Ayaz Rahman Bhuiyan Matric Number : A18CS4039 Phone Number : +6011-21321275 E-mail : ayaz.bhuiyan@gmail.com
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PART A - Tools needed to assemble a PC

1.0 Screwdrivers

The screwdrivers are used for opening the screws in the case. The flat-head screwdriver is used to tighten or loosen slotted screws of the CPU. The Philips head screwdriver is used to screw the motherboard and IO-shield into the case. It is also used to screw in the CPU cooler and other CPU fans into the case. Thus the screwdriver is necessary and we would not be able to connect any part to the case without it.

2.0 Zip ties

Zip ties are used to hold cables together and are usually used within the case for cable management. This is essential because inside the case it will affect airflow and also make the layout flow better.

3.0 Thermal Paste

Thermal paste is applied between the CPU and cooler. In order to allow good CPU cooling, it is an essential component. The thermal paste is important because it enables the proper transfer of heat between the two metal surfaces

4.0 Anti- static equipment

An anti-static equipment consists of a rubberized mat and a wrist strap that connects to both the mat and the computer we are working on. This kit is important because it protects the equipment from static damage and protects against scratches our tabletop.

5.0 Pliers

The heads of poorly implemented screws are often stripped away. Then we have to use pliers to cut the screws. The extra remains of cable ties are removed by using pliers. They are also very useful on motherboards and hard drives when adding or removing jumpers. Thus it is really an important tool for assembling PC as they function as a versatile multi-purpose instrument.

PART B – Sketch of a motherboard layout|

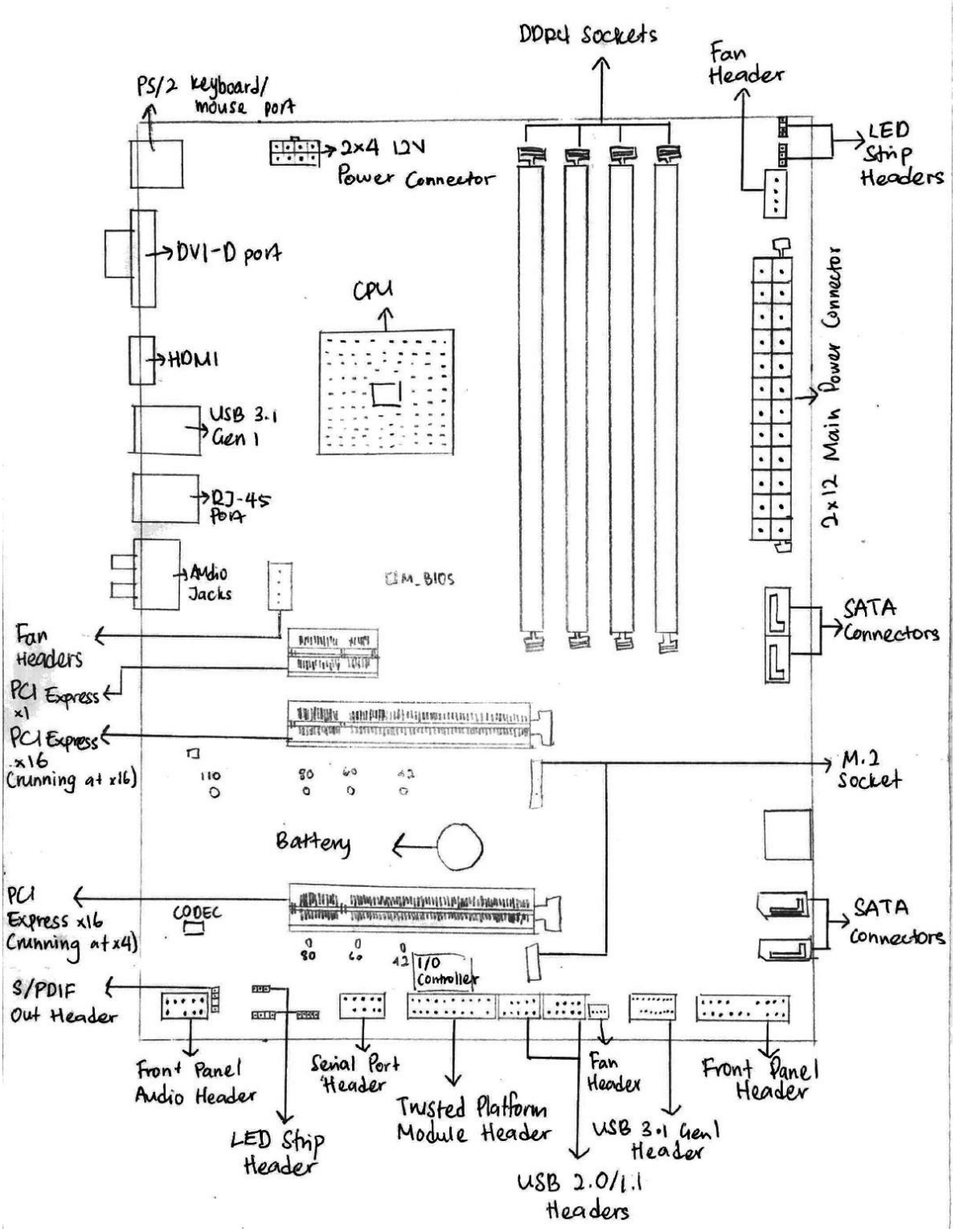


Figure: sketch of the motherboard layout

Components and Function

1) CPU – AMD Ryzen 5 1600

The term CPU mean central processing unit, which is also known as central processor, main processor or just processor. It is known to be the brain of the computer. By putting billions of microscopic transistors on a single computer chip, CPUs are built. These transistors help it to make the calculations it needs to run program stored in the memory of your device. A CPU can perform different logical, controlling, arithmetic and input/output operations as per the instructions.

2) Graphic Card – GeForce GTX 1070

A graphics card is a type of display adapter or video card mounted to display graphical data with high clarity, colour, definition and overall appearance within most computing devices. A graphics card offers a high-quality visual display by using advanced graphical techniques, features and functions to process and execute graphical data.

3) RAM – G.Skill Ripjaws V Series Black 16GB DDR4

RAM (Random Access Memory) is the hardware in a computer device where the operating system (OS), application programmes and data are stored in current use so that the processor of the device can be accessed quickly. In a computer, RAM is the primary memory. It is much easier than other forms of storage to read from and write to, such as a hard disc drive (HDD), solid-state drive (SSD) or optical drive.

4) Heat sink

Each second, a computer's CPU can perform millions of calculations. It begins to produce heat as the processor continues to operate at a rapid speed. The processor could overheat and eventually destroy itself if this heat is not kept under control. A *heat sink* is a passive heat exchanger that incorporates a fan or another mechanism to reduce the temperature of a hardware component (e.g., processor).

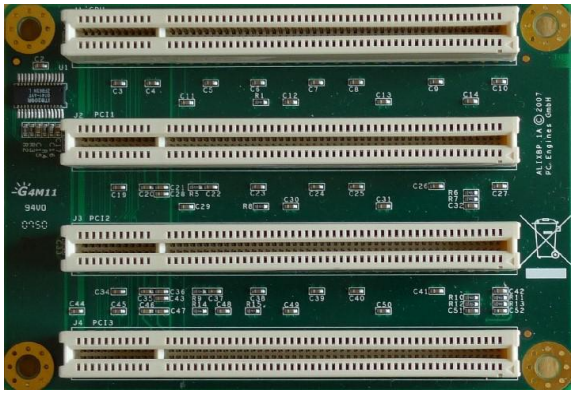
5) CD-ROM

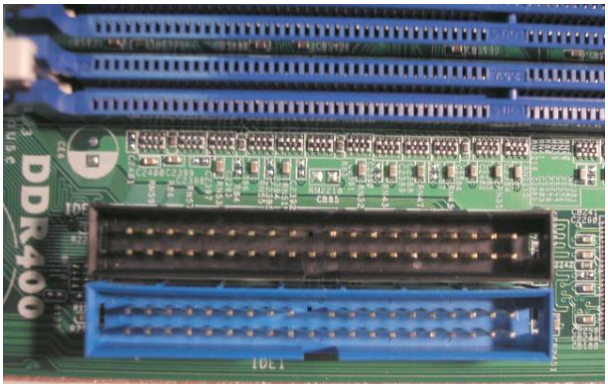
A CD-ROM (Compact Disc Read-Only Memory) is an optical disc that contains audio or software data whose memory is read-only. It is a pre-pressed optical compact disc that contains data. Computers can only read—but cannot write or erase CD-ROMs.

6) USB Cable

A Universal Serial Bus (USB) is a standard interface that allows for communication between computers, such as a personal computer (PC) or smartphone, and a host controller. It connects devices like digital cameras, mouse, keyboards and printers, and connects to media devices like external hard drives and flash drive devices.

7) PC/IDE Slots





Through inserting additional circuit boards, we can extend your PC internally. These boards or expansion cards are directly connected to motherboard expansion slots (as shown in this figure). So, by adding options not included with your standard PC, you can extend the computer system. The IDE is a common interface for connection of a motherboard to storage devices, such as hard drives and CDROMs/DVDs. The original IDE was fitted with a 16-bit interface that linked two devices to a single belt. This economic IDE gadget had its own circuitry and a built-in disc drive controller. Controllers were independent external machines before IDE.

8) SATA Cable

For connections in computer cable assembly systems, such as storage devices, Serial Advanced Technology Attachment (SATA) or Serial ATA Cables are used. The SATA technology itself is a connector interface mainly used in storage applications for device bus connections. In this application, a mass storing instrument is used to connect a cable to a host bus adapter such as a motherboard (for example, hard discs, optical driving, memory units).

9) IDE Cable

IDE, a common form of link for storage devices on a motherboard, is the synonym for integrated drive electronics. Generally, IDE refers to the cable and ports types used for the connection to one another and the motherboard of some hard drive/optical drive. Therefore, an IDE cable is a cable that meets this requirement.

10) PSU

For internal components of a computer the power supply unit (PSU) converts AC mains to low voltage regulated DC power. The use of switched modes of power is universal to modern personal computers. There is a manual adjustment in some power supplies to pick the input voltation, while others automatically change to the power supply.

11) Hard Disk

A hard disc drive (HDD) is a data storage system that is non-volatile. It typically is internally mounted on a computer and directly connected to the drive controller of the motherboard of the computer. As the main storage unit in a computer, hard disc drives are widely used. Often, HDDs store operating systems, software programs and other files, and can be found in data centres on desktop computers, handheld devices, consumer electronics and enterprise storage arrays.

PART C – Step by Step PC Assembly

STEP 1 – Gather the tools/equipment needed to build the PC

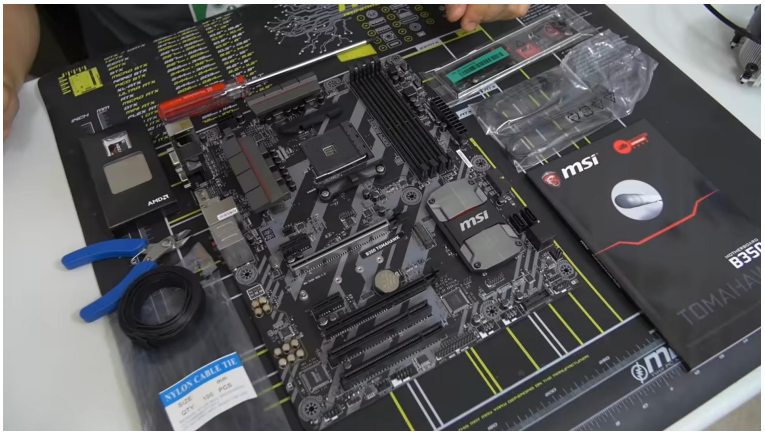


Figure: Necessary tools for building a pc

To complete the assembly of a new PC from start to finish, here's the list of every single tool, piece of equipment, and component that we need:

i. Screwdrivers **ii.** Zip ties **iii.** Thermal Paste **iv.** Pliers **v.** Suitable Surface **vi.** Motherboard Manual

STEP 2 – Open the Case and prepare for installation

Figure: Opening the case

Place the CPU casing on the table and then find screws that hold the panel. Remove the screws to slide down the panel.

STEP 3 – Make the case ready to be assembled

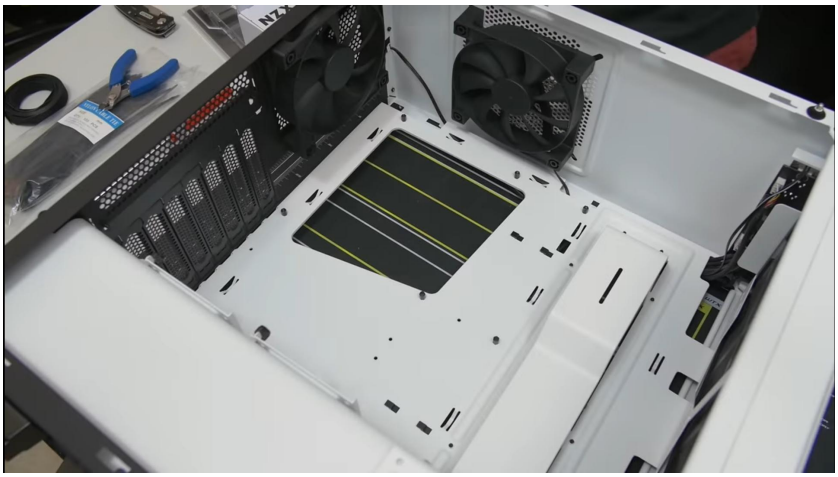


Figure: Making the case ready to be assembled

1. Inside the case, remove any parts or packaging materials that may have been shipped together.
2. Take note of the wires pre-installed in the case. There should be front panel connections for features like the power button, audio jacks and USB ports.

STEP 4 – Install motherboard

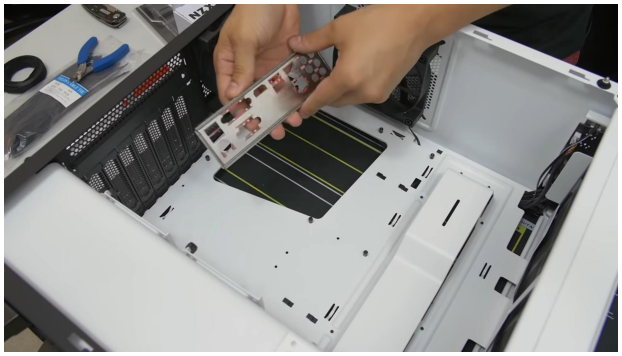


Figure: Holding the I/O plate

Figure: Placing the motherboard

1. Place the motherboard in its designated place at the bottom part of the CPU.
2. Put the I/O plate into the opening in the back of the case. The plate need to puch in from the inside.

3. Lower the motherboard into the case and make sure it position is align with the I/O plate.
4. Install the screws to make sure the motherboard did not move.

* The motherboard must only touch the screws to avoid the damage to the motherboard. You also must mount all the screws.

STEP 5 – Install power supply

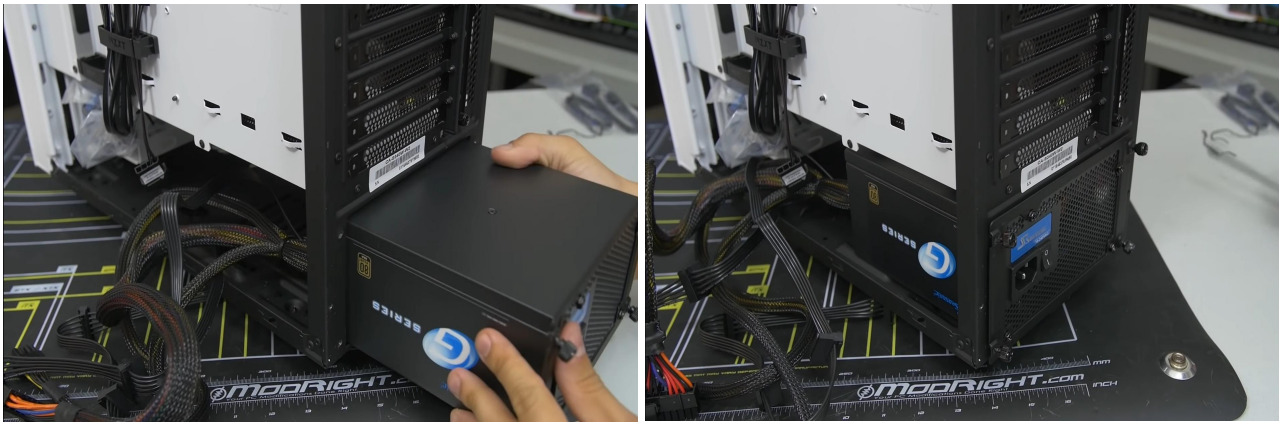


Figure: Installing power supply

1. Align the power supply with the mounting holes as shown.
2. Insert screws and tighten it using screwdrivers.

STEP 6 – Install front panel connectors

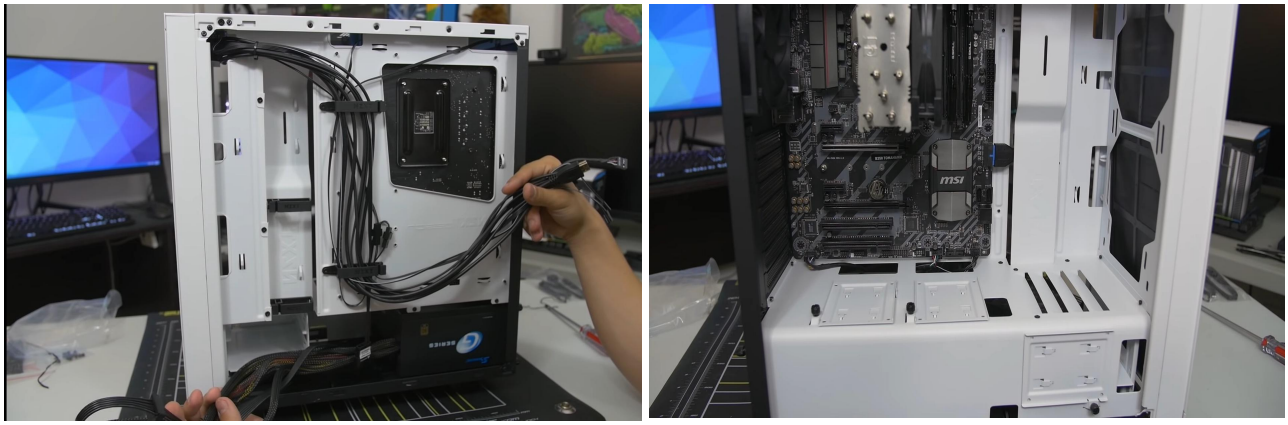


Figure: Setting front panel connectors

At first we need to check our motherboard manual to know where to connect the front panel cables. By knowing exactly where everything plugs in and pretending to connect everything, you get a

sense of how loose the cables will be once they're plugged in and can therefore plan ahead to tuck the cables away more neatly somehow.

STEP 7 – Install CPU fan

CPU fan is a combination of heat sink and fan. It helps to blow hot air off the processor and keep it cooler.

Figure: The fans have been installed

Most of the fans will have either three or four-pin connectors, so we'll need to look for the corresponding headers on your motherboard. Our motherboard's instruction manual should have a diagram of where they all are.

STEP 8 – Install hard disk

Figure: The hard disk has been connected

1. Slide the hard disk into the place until the holes in the case are align with the screw holes at the side as shown in Figure 7.
2. Install the screws to all the sides needed to be screwed.

STEP 9 – Install RAM

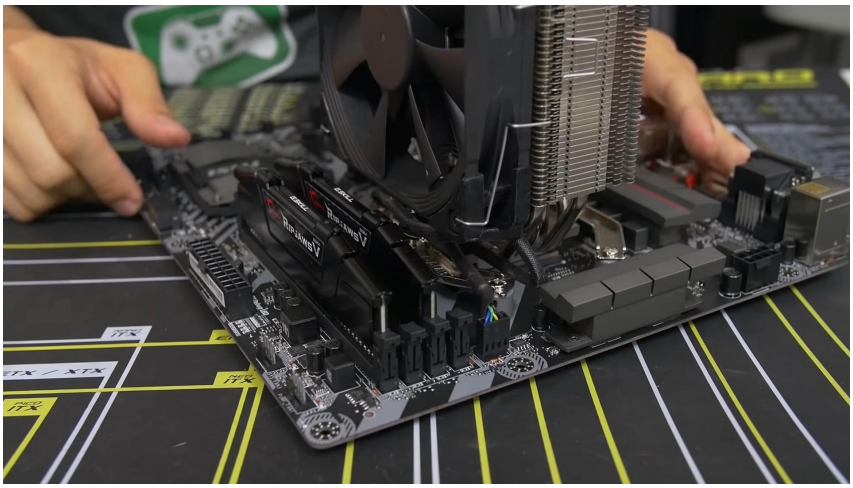


Figure: The rams have been installed

1. Put the RAM board in the socket as shown in the Figure. Make sure the notch in the board is in the correct location. If it is not, turn it around 180 .
2. To set it into the socket, press firmly on both ends of the board. Ensure that the tabs lock in place.

* When the tab is not aligned, pressing the board in could damage both the RAM boards and the motherboard.

STEP 10 – Install CPU fan

CPU fan is a combination of heat sink and fan. It helps to blow hot air off the processor and keep it cooler.

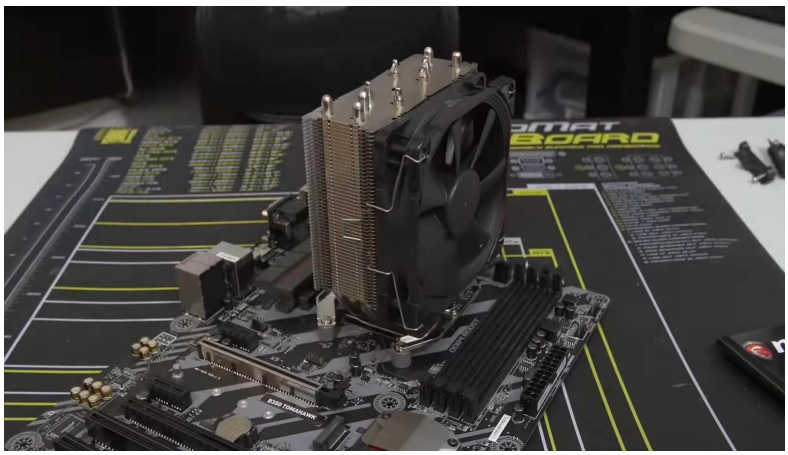


Figure: The cpu fan has been placed with thermal paste

1. By following the instructions given with the compound, place the thermal compound on the CPU.

2. When the mounting tabs aligned, set the fan assembly to the CPU.
3. Use the screws to lock the CPU fan as shown in Figure 11.
4. Attach the power connector of the fan assembly to the motherboard.

* If the thermal compound is not applied, there will be inadequate cooling and bring damage to the CPU or the motherboard or both.

STEP 11 – Install CPU

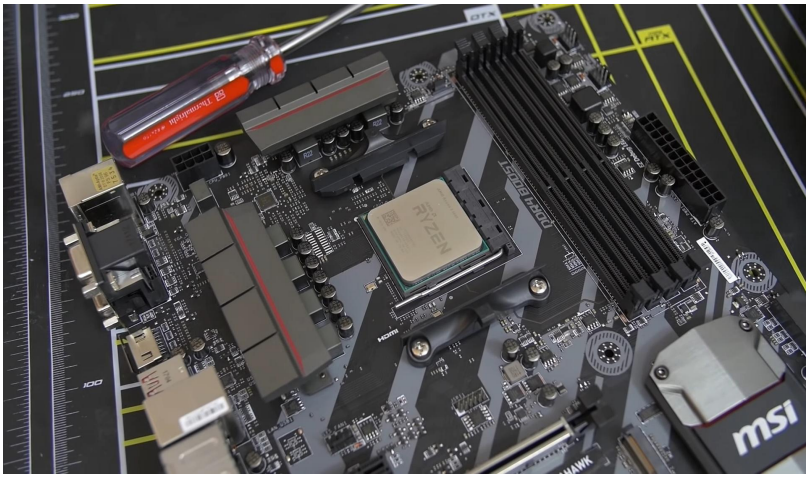


Figure: The processor has been successfully locked

1. Find the corner marking that shows CPU pin 1.
2. Pull up the metal rod that hold the processor and put the CPU as in Figure 10.
3. Find the marking on the CPU and align it with the marking in the CPU socket.
4. Push down the metal rod to lock the processor.

STEP 12 – Install optical disc drive (CD ROM)

Figure: Installing the CD ROM

1. Put the drive bay until the screw holes are lined up and it is oriented correctly.
2. Install the screws to lock it.

STEP 13 – Connect the cables

Figure: The cables have been connected

1. Connect the one end of the SATA cable to the drive and the other one to the available SATA port on the motherboard as shown in Figure 13.
2. The IDE cable will connect some hard drives and optical drives to each other and to motherboard as IDE cable have three connection points (Figure 14).
3. Data cables such as USB cable and VGA cable connects the drives and devices of the front to the motherboard.

STEP 14 – Close the case and connect with the peripherals

Figure: Setting up the case

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

Figure: Peripheral devices are connected

Connect peripherals devices which include keyboard and mouse as shown in Figure.

Figure: Monitor connected with the CPU

Finally connect the CPU with monitor by plugging into display ports as shown in Figure 17.