UTM UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

Semester I 2020/2021

Subject : Technology and Information Systems (SECP1513)

Section : 03

Assignment : Step by step PC Assembly

GROUP NAME / NUMBER : 9

1	Name : MUHAMMAD NAZRI IZZAT BIN HAMDAN Matric Number : A20EC0216 Phone Number : 012-3385480 E-mail : mnazriizzat@gmail.com
2	Name : NURIN SOFIA BINTI NORAZMI Matric Number : A20EC0123 Phone Number : 013-6931890 E-mail : nurins30@gmail.com
3	Name : RIDWAN BIN MONJUR Matric Number : A18CS3026 Phone Number : 011-3962 9849 E-mail : mjrrdn@gmail.com
4	Name : ASHRAFUR RAHMAN NAZIN Matric Number : A20EC4012 Phone Number : 011-6133 7480 E-mail : ashnazin22@gmail.com
5	Name : JAMEE SHAHRIYAR Matric Number : A18CS3012 Phone Number : 011-6178 5945 E-mail : jameeshahriyarfwt@gmail.com

PART A - Tools needed to assemble a PC

1.0 Screwdrivers

The screwdrivers are used to open the case screws. The Philips head screwdriver is used to screw the motherboard and IO-shield into the case. It is used to screw the power supply to the case. It is used to screw in the CPU cooler and other CPU fans into the case. Therefore the screwdriver is important and without it we wouldn't be able to attach any component into the case.

2.0 Zip ties

Zip ties are used to hold cables together and are mainly used for cable management inside the case. This is important because it will affect airflow inside the case and also make the setup look neat.

3.0 Thermal Paste

Thermal paste is applied between the CPU and cooler. It is important because it allows heat to transfer properly between the two metal surfaces. It is an essential component to allow good CPU cooling.

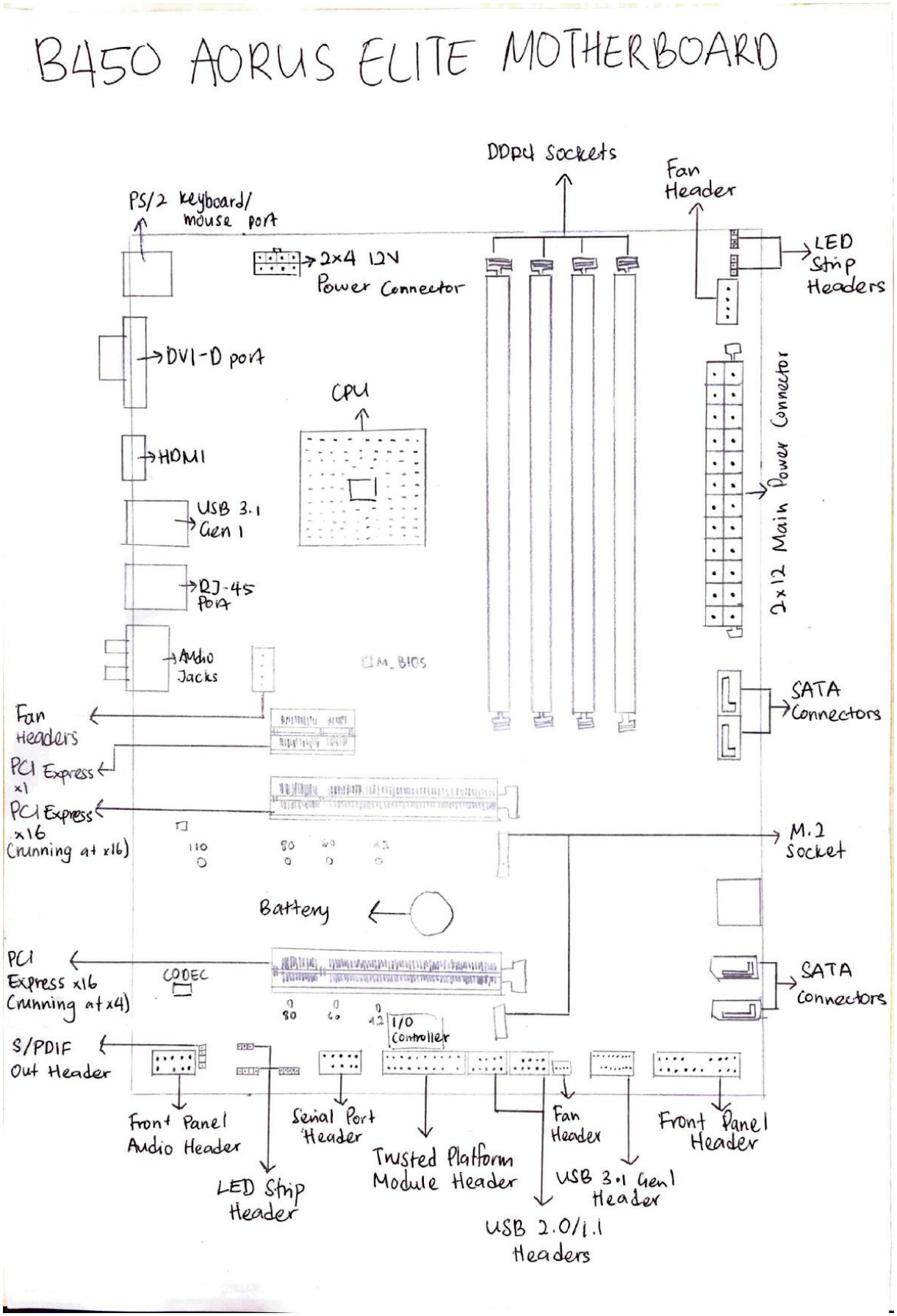
4.0 Anti- static equipment

To ground oneself while assembling a PC anti- static equipment such as the wrist band above has to be worn. This is important because electrostatic discharge from a person's fingers can damage and potentially kill the delicate components inside our processors, graphic cards and other pc components.

5.0 Pliers

Sometimes the heads of poorly made screws get stripped. Then pliers have to be used to remove the screws. They are used to cut the extra remnants of cable ties. They are also very useful when inserting or removing jumpers on motherboards and hard drives. So pliers are important because they act as a flexible multi-purpose tool.

PART B – Sketch of a motherboard layout



Components and Function

1) Graphic Card – RX 6800 XT

Graphics cards allow computers to produce graphics and images more quickly. A graphics card has its own processor, a GPU or graphical processing unit, according to Jason Cross at PC World. The video card connects to the motherboard and the monitor. This allows the card to accept information from the CPU (central processing unit) and send output to the monitor.

2) CPU – AMD Ryzen 9 5900X

CPU is the “brain” of the computer system. It is an electronic circuit in computers which carries out the instruction of a computer program by performing several operations. A CPU can perform various logical, controlling, arithmetic and input/output operation according to the instructions

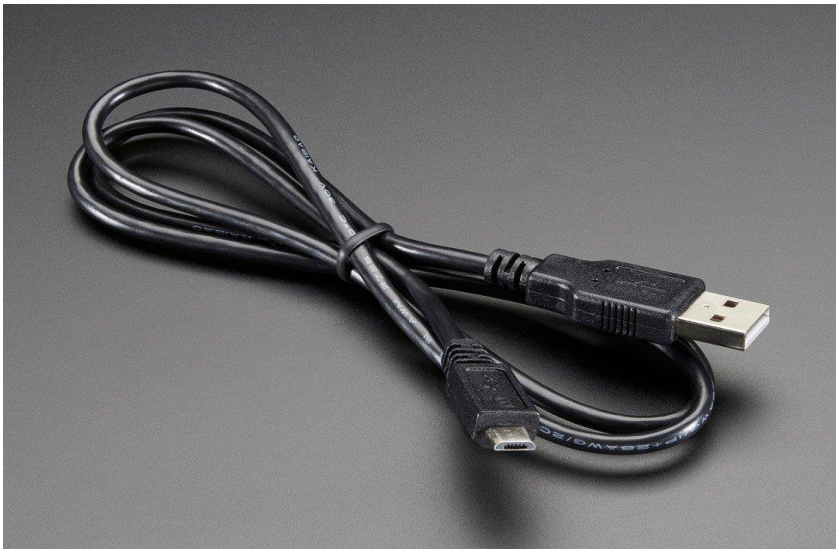
3) Heat sink

A heat sink is a component that increases the heat flow away from a hot device. It accomplishes this task by increasing the device's working surface area and the amount of low-temperature fluid that moves across its enlarged surface area.

4) CD-ROM

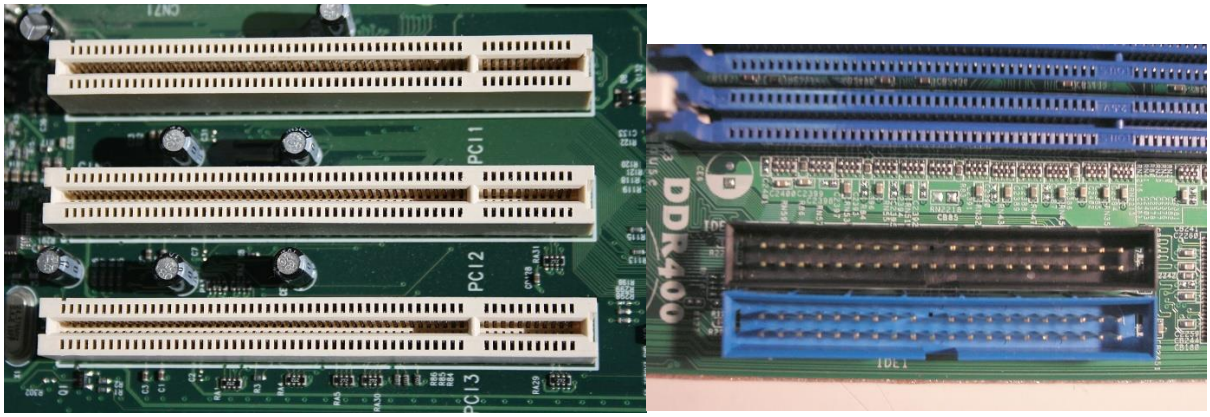
Short for Compact Disc Read-Only Memory, a CD-ROM is an optical disc that contains audio or software data whose memory is read-only.

5) USB Cable



The term USB stands for "Universal Serial Bus". USB cable assemblies are some of the most popular cable types available, used mostly to connect computers to peripheral devices such as cameras, camcorders, printers, scanners, and more. Devices manufactured to the current USB Revision 3.0 specification are backward compatible with version 1.1.

6) PC/IDE Slots



You can expand your PC internally by adding additional circuitry boards. Those boards, or expansion cards, plug directly into expansion slots on the motherboard (as shown in this figure). So, you can expand your computer system by adding options not included with the basic PC.

Integrated Drive Electronics (IDE) is a standard interface for connecting a motherboard to storage devices such as hard drives and CD-ROM/DVD drives. The original IDE had a 16-bit interface that connected two devices to a single-ribbon cable. This cost-effective IDE device carried its own circuitry and included an integrated disk drive controller. Prior to IDE, controllers were separate external devices.

7) RAM – Corsair Vengeance RGB Pro DDR4 3600MHz

Computer random access memory (RAM) is one of the most important components in determining your system's performance. RAM gives applications a place to store and access data on a short-term basis. It stores the information your computer is actively using so that it can be accessed quickly. The more programs your system is running, the more you'll need.

8) SATA Cable

Serial Advanced Technology Attachment (SATA) or Serial ATA cables are used to connect devices in computer cable assemblies, such as storage devices, for example. The SATA technology itself is a connecter interface primarily used for computer bus connections in storage applications. In this application, the cables are used to connect a mass storage device (e.g. hard disk drives, optical drives, solid-state memory drives) to a host bus adapter such as a motherboard.

9) IDE Cable

IDE, an acronym for Integrated Drive Electronics, is a standard type of connection for storage devices in a computer. Generally, IDE refers to the types of cables and ports used to connect some hard drives and optical drives to each other and to the motherboard. An IDE cable, then, is a cable that meets this specification.

10) Power Supply – Cooler Master V1300 Platinum

Power supplies have essential functions found in all models with additional operations added depending on the device type. Power supplies may need to change voltage up or down, convert power to direct current, or regulate power for smoother out coming voltage

11) Hard Disk - WD Red NAS Hard Drive

A computer hard disk drive (HDD) is a non-volatile memory hardware device that controls the positioning, reading and writing of the hard disk, which furnishes data storage. Hard disk drives are commonly used as the main storage device in a computer. HDDs often store operating system, software programs and other files, and can be found in desktop computers, mobile devices, consumer electronics and enterprise storage arrays in data centres.

PART C – Step by Step PC Assembly

STEP 1 – Open the case

Figure 1

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

STEP 2 – Make the case ready to be assembled

Figure 2

1. Remove any pieces or packing materials inside the case that could have been shipped together.
2. Take note of the pre-installed wires in the case. For features like the power switch, audio jacks and USB ports, these should be front panel connections.

STEP 3 – Install motherboard

Figure 3

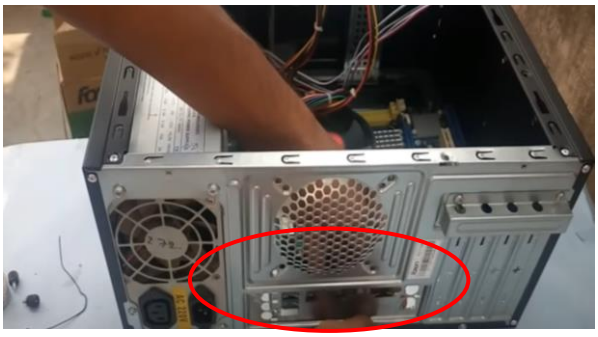


Figure 4

1. Place the motherboard in its designated place at the bottom part of the CPU.
2. Put the I/O plate (red circle in Figure 4) 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 4 – Install power supply

Figure 5

Figure 6

1. Allign the power supply with the mounting holes as shown in Figure 5.
2. Insert screws and tighten it using screwdrivers as in Figure 6.

STEP 5 – Install hard disk

Figure 7

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 6 – Install RAM

Figure 8

1. Put the RAM board in the socket as shown in the red circle in Figure 8. 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 7 – Install CPU

Figure 9

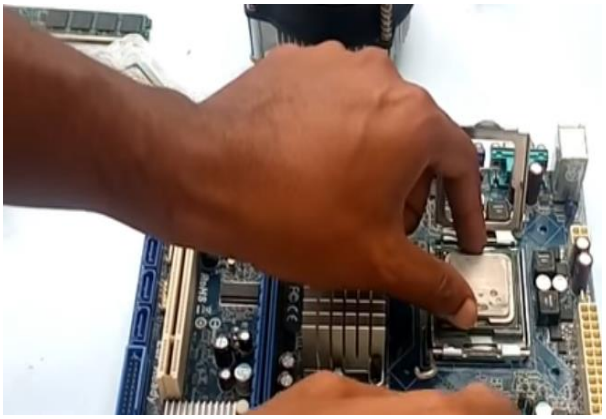


Figure 10

1. Find the corner marking that shows CPU pin 1. As shown in Figure 9, the corner is marked with an arrow (in the red circle).
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 8 – 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 11

1. By follow 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 9 – Install optical disc drive (CD ROM)

Figure 12

1. Put the drive bay until the screw holes are lined up and it is oriented correctly as shown in Figure 12.
2. Install the screws to lock it.

STEP 10 – Connect cables

Figure 13

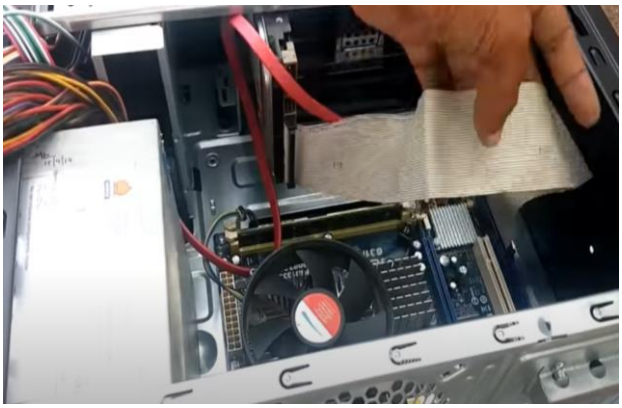


Figure 14

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 11 – Close the case and connect with the peripherals

Figure 15

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

Figure 16

Connect peripherals devices which include keyboard and mouse as shown in Figure 16.

Figure 17

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