UTM UNIVERSITI TEKNOLOGI MALAYSIA
SCHOOL OF COMPUTING
Faculty of Engineering

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Section : 07

Task : Step by step Basic PC Assembly

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Introduction

A PC is a modular type of computer that can be assembled using hardware components made by different manufacturers. This allows you to have a custom-built computer that matches your specific needs.

PC assembly has been divided into three parts. In part A we will give description about tools which are essential for pc assembly.

Part A

1.0 Screwdrivers

The screwdrivers used to turn the screws used in the PC assembly operation. Screwdrivers can easily fit the screws into the specific location on the PC. It can also be used to adjust the tightness of the screw. The importance of this tool is that it can ensure that the PC does not disassemble when the PC fall to the ground or being hit by hard objects.

2.0 Pliers

The pliers are used to cut or bend small wires used in the PC assembly. It can also be used to reach the small areas where cables and materials become stuck and unreachable with our bare hands. The importance is that it can produce a better electrical wiring where the wires are well shaped and neatly arranged. Good arrangement of the wires will ease the process of detecting any damage on the wires if the PC is not working.

3.0 Cable ties

The cable ties are used to bundle the cables and wires to keep them organized and prevent damage. The importance is that it can prevent from the wires being tangled. Tangled wires usually time consuming to untangle.

4.0 Thermal compound

The thermal compound is used as an interface between heat sinks and heat sources such as high-power semiconductor devices. It is used to eliminate air gaps or spaces from the interface area to maximize heat transfer and dissipation. The importance is to cool the CPU and allowing the CPU to run at a higher speed and improve system performance.

Part B

A motherboard is the primary printed circuit board in general-purpose computers. It holds and enables communication between many of the key electronic components of a device.

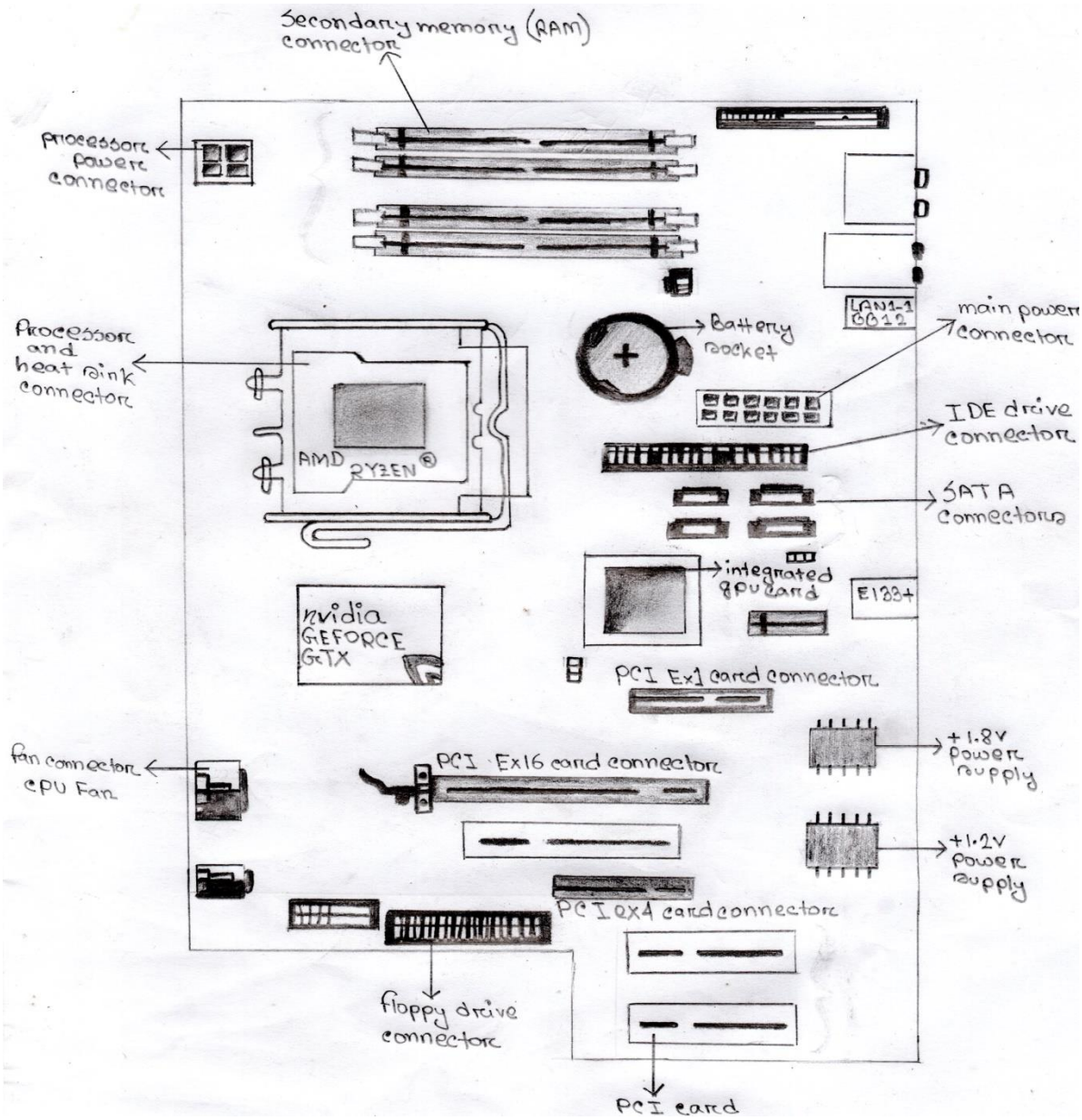
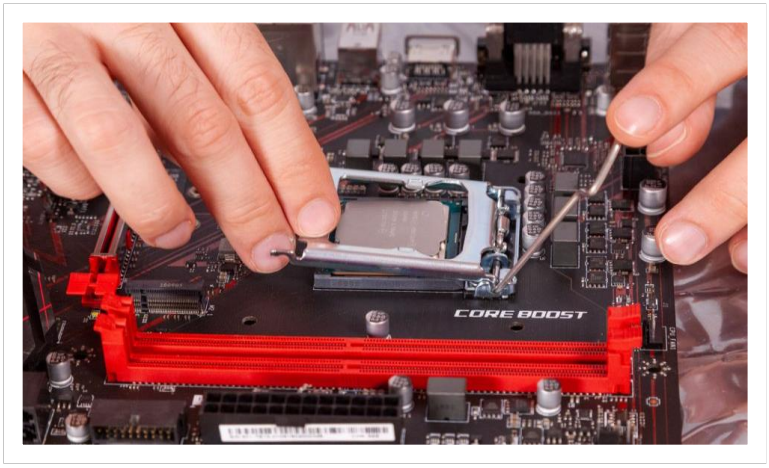


Figure: sketch of motherboard

Part C

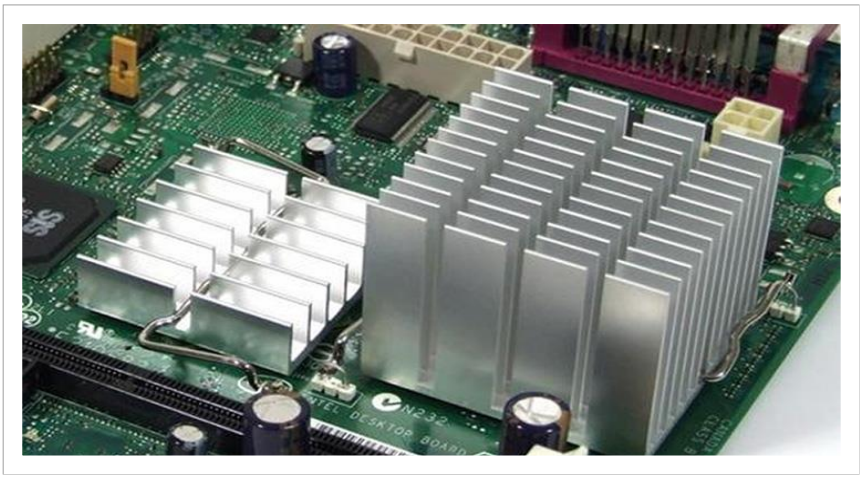
Step 1: CPU



If you're going to create Intel or AMD, the first move is to release the CPU tension lever so that you can lower the processor to the CPU socket. (The main difference here is that on Intel, the pins are built on the socket, while on AMD, the pins are on the CPU.)

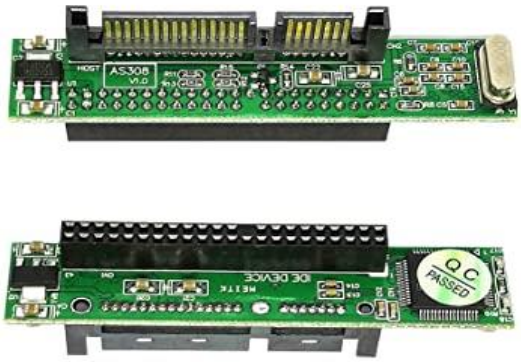
The arrow/triangle at the top of the CPU must be lined with one on the socket or socket cover. Don't try to mount a Processor with an arrow in the wrong direction, or you might destroy your chip, board, or both of them! Once your CPU and socket are correctly matched, you can drop the chip in place and place it in the socket under your own weight. If this is not the case, pick up the CPU and re-seat it. Don't push the processor into the socket, or you're almost definitely going to hurt something. Once the CPU is properly mounted in the socket, press the tension lever back down (on Intel motherboards like the one in the image above, this will also include a metal plate that holds the CPU in).

Step 2: Heat Sink



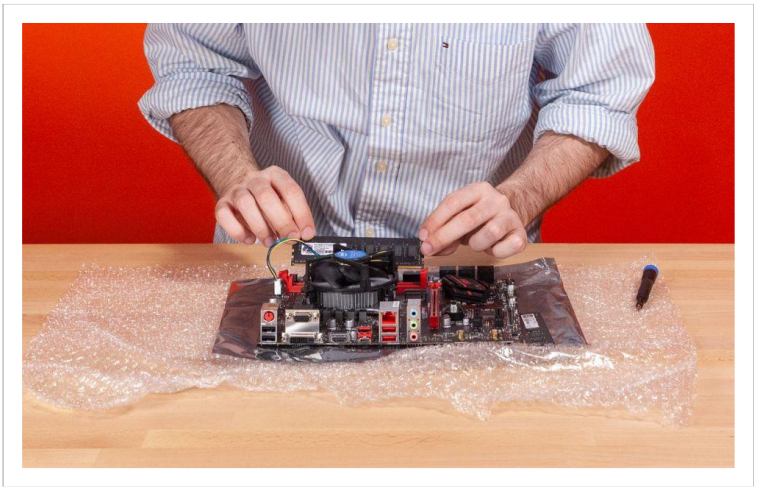
If you've finished mounting the Processor, the fan, and the RAM (plus the M.2 SSD if you have one), and you've completed a short external test to be on the safe side, it's finally time to lower your mother ship to the deep dark depths of your case. First of all, you need to fit the motherboard back plate and mount the case standoffs (screws that create a gap between the case and motherboard). Then it's a matter of slowly lowering the board to balance the back plate first, and then to the standoffs. Finally, you screw it in the board to lock it.

Step 3: IDE Slot



Typically, the motherboard would have two IDE sockets, 'Primary IDE' (or IDE0) and 'Secondary IDE' (or IDE1). Up to two devices can be attached to each IDE connector using an appropriate cable. Since the computer can only 'connect' to one device at a time, each device has 'priority,' 'High Priority' or 'Slave Priority' (Low Priority). Priority is configured on IDE devices using a tiny 'Jumper' limit (pictured top left). A thin metal clip inside the cap attaches the two pins it protects and configures the hardware.

Step 4: RAM

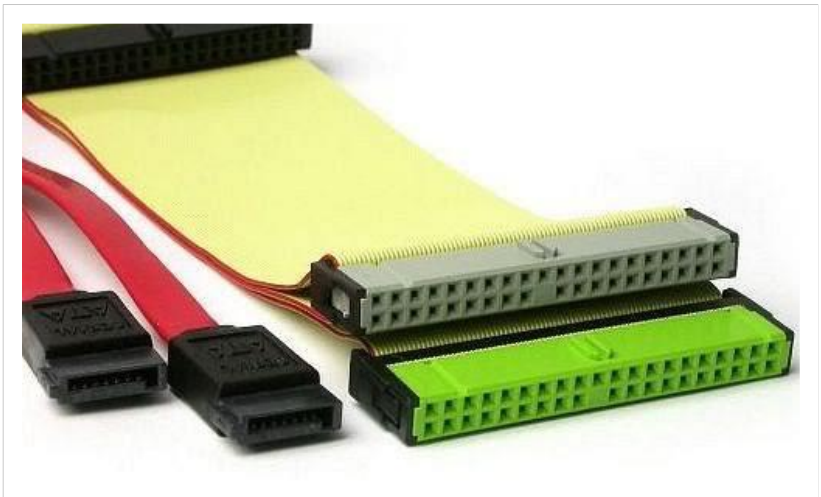


Installing RAM is a snap—literally. Next, make sure the latches for each memory slot are open. Some boards have latches on either side of the RAM slot, while others—often budget boards—have latches on one side, and the other end is locked in place. If your latches have been opened, take a look at each DIMM and position it over the slot so that the slight divot on the bottom of the RAM stick is matched with the corresponding bump on the board. Finally, press down on either edge of the DIMM until it snaps into place, allowing the locks to close on their own. The method needs a little bit of force, so if you're having trouble, make sure you're not bringing the module back in. If you are mounting two RAM sticks on a board with four slots, review the motherboard manual to make sure that you are installing your DIMMs on the correct slots. If you place them in the wrong slots, you may not get the best result possible, or the motherboard/operating system may not remember either of the sticks.

Step 5: USB Cable

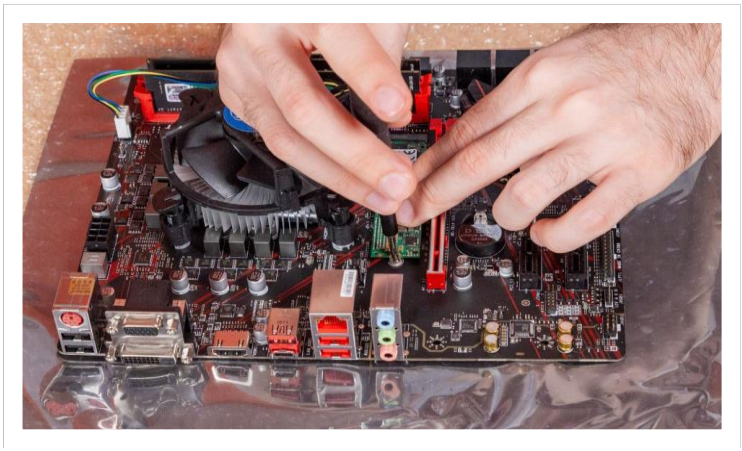
If your case has a front-mounted USB port or a card reader, you'll need to connect it to the spare headers on your motherboard. The cable is likely to be branded as USB in the case. Your motherboard may have "USB"-marked spare connectors, but the manual will tell you precisely where the pins are located if they exist. USB connectors require power, so you need to plug the cable in the right direction. Luckily, in most PC instances, USB ports have a single connector that only attaches to the motherboard in one direction. If your PC doesn't have a built-in socket, you'll need to review the case and motherboard manuals closely and make sure you install the wires properly. Assuming you are using a block connector, plug it into the spare USB pins on the motherboard. It's safer to use the nearest cable header to prevent draping cables anywhere.

Step 6: IDE Cable



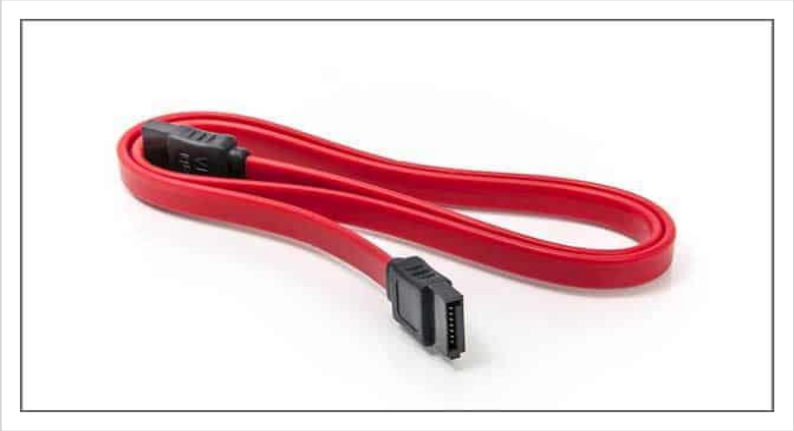
There are only two types of IDE cables available: single-device cables and daisy-chain cables. You can use a daisy-chain cable even though you're running on a single computer. Note that the cable has a red stripe. The stripe refers to the pin 1 of the IDE controller. (Pin 1 is normally labeled.) Align the red stripe on the IDE cable with the pin 1 on the IDE controller and link the cable to the controller.

Step 7: Hard Disk



There are a few forms of hard drives you need to consider. The regular SATA hard drive is 3.5 inches in height, but is also available in 2.5 inches for notebooks. These hard drives have a rotating disc inside, making them less durable but cheaper and able to carry more files. Newer drives or Solid-State Drives (SSDs) are also 2.5 inches in height. They don't have a rotating disc, allowing them to run faster than the regular hard drive. However, SSDs are more expensive and have fewer data. For best performance, it is generally advised to provide an SSD that houses the operating system and the most relevant applications, while the majority of the information on the device is saved on the normal hard drive. The third form of hard drive is M.2, which is a small, bare chip of around 1 x 3 inches. This M.2 drives appear to be the costliest choice and are only available for some motherboards. In your case, there should be a hard drive bay for a hard disc or an SSD. Since SSDs are smaller in size, you can need to buy an additional SSD bracket to fit into the bay. Slide your hard drive or SSD to one of the bay slots. The drive should be positioned with the connectors on the inside of the motherboard. The drive includes power from the PSU and a SATA link from the motherboard. They should be easy to find, since the cables are L-shaped.

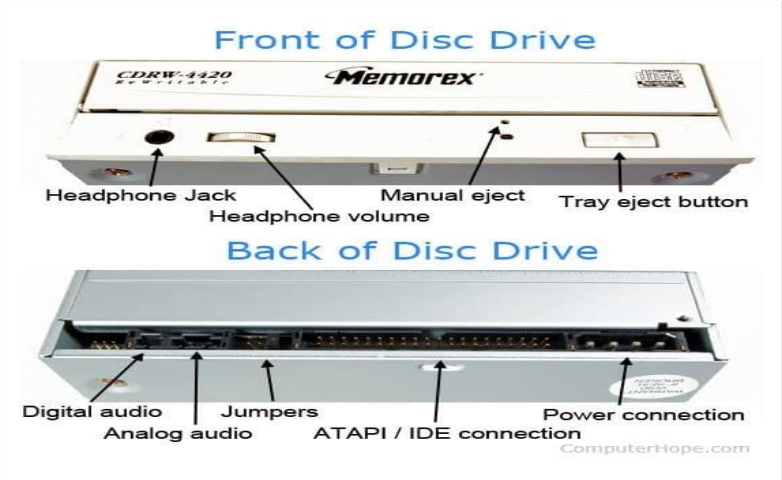
Step 8: SATA Cable



Installing SATA cables should not be a difficult job, but it is still necessary to complete the installation safely and correctly. The exact installation procedure can vary depending on the intended intent of the SATA cable.

If you are using a SATA cable to connect extra capacity to your configuration, you do not need to address the original hard disc. Insert the new hard drive into an empty bay in the PC case, preferably with space between new and current drives to allow greater airflow. Ensure that the SATA cable link ports are readily accessible and keep the drive-in place. Attach the SATA cable to the hard drive connector, then connect the other end of the cable to the motherboard, taking care not to interrupt or obstruct the connection to the current HDD. The primary drive should be wired to the lowest SATA port on the motherboard – usually SATA 0 or SATA 1.Complete the procedure by ensuring that all communications are protected, that the PC housing is locked, and that the device is powered up until it is safe to do so. You will need to format a new drive or possibly reinstall an operating system, depending on the details of the program.

Step 9: CD ROM



Until mounting a CD drive, it is important that the jumpers are properly set to secondary, primary, or cable select. The CD-ROM may have two cables attached to it and it could have an audio connection, which is the smaller of the cables. When connecting this cable to a CD-ROM drive, there should be a 3 or 4 pin cable link. (see above picture). Make sure you attach the wire plug to this cable, not the jumpers on the back of the drive. Although it could be feasible for the cable to link to these pins, this may create further problems.

Then connect the 40-pin IDE/EIDE interface cable (large grey ribbon cable) to the back of the CD-ROM drive. This cable has one side of the cable, which is red or blue, meaning PIN 1. This side of the cable also leads to where the control is attached to the CD-ROM drive.

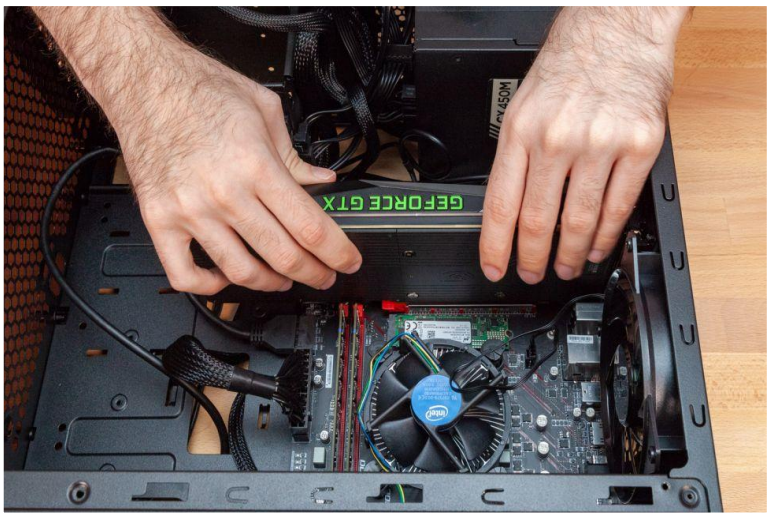
Finally, link the Molex power cable to the back of the CD-ROM drive. This cable is keyed, so it can only be attached to the device in one direction.

When the cables are attached to the drive, connect the opposite ends of the IDE/EIDE interface cable and the audio cable to their respective positions. The audio cable can attach to one of the following locations: sound card, motherboard (when onboard sound present), or DVD decoder card.

Step 10: Power Supply

The PSU is normally placed on the back of the box. Often, you'll see it at the tip, but it's generally placed at the bottom, so it can suck the cold air from beneath the chassis. When you put it in order, it's usually as easy as screwing it in place with four screws at the back of the box. Then insert the 24-pin power connector and the additional/CPU power connector into the motherboard.

Step 11: Graphics Card



It's an optional move. If you are using an Intel or AMD CPU with built-in graphics and don't expect serious games, you do not need or want a standalone graphics card. Many AMD CPUs, as well as high-end Intel versions, do not have on-board graphics, however, and would need a graphics card to connect and output to your computer. You'll actually need to remove several slots covers on the back of the case to install the GPU, so that HDMI, DVI and other ports show up, allowing you to attach your monitor(s) later. Attach the GPU to the PCIe X16 slot on your motherboard (it's the long one, and you'll want to choose the top one if there's more than one on your motherboard). If required, insert the PCIe power connectors into the card from the power supply.

Last Step

CLOSING THE CASE AND CONNECTING THE PERIPHERALS.

**********THANK YOU**********