Assembling a computer

After buying all the computer components they must be put together. This process is called assembling. It must be done carefully so as to avoid unnecessary damage to the system.

Materials Required

1. Processor
2. Motherboard
3. Hard disk
4. RAM
5. Cabinet (with SMPS)
6. Floppy Disk Drive
7. CD Drive
8. Add on Cards
    1. Display Card (Not needed if On-board display is available on Motherboard)
    2. Sound Card (Not needed if On-board display is available on Motherboard)
    3. Modem
    4. Other Cards (If any)
9. Monitor (CRT or LCD)
10. Keyboard
11. Mouse
12. Speaker
13. UPS
14. Cables (Power cables, IDE cables)

Procedure

Installing the SMPS (switched mode power supply)

SMPS will be already screwed into the cabinet. Make sure that it is screwed properly.

Installing Motherboard

First of all match up the mounting holes in the motherboard with the ones on the cabinet. The mounting holes locations are standardized; but in practice, it's rather unusual to find a case and motherboard whose mounting holes exactly matches. More often we will look at the mounting holes in the motherboard to determine which mounting holes on the case we will be using.
Once we have determined which mounting holes in the cabinet we will be using, we will need to insert standoffs in the holes. There are several types of standoffs. The purpose of standoffs is to avoid the back of the motherboard from touching the metal surfaces of the case after it is installed, avoiding a short-circuit. Screw the standoffs in the mounting holes in the cabinet that correspond to the holes in our motherboard. Screw the motherboard into the standoffs placed in the cabinet.

Fixing the processor in the motherboard

Raise the locking lever, align the chip, and gently insert the chip into the ZIF(Zero Insertion Force)Socket. ZIF sockets don't need any force to insert the chip. The chip goes in only one way: One corner has a missing pin, an arrow and a cutting edge, and there is corresponding corner on the socket. Lock the chip in place with the locking lever.

The CPU goes in first. Raise the locking lever, align the chip, and gently insert it. Socket 7 is a zero insertion force socket and doesn't need any force to insert the chip. The chip goes in only one way: one corner has a missing pin, an arrow, and a beveled edge, and there's a corresponding corner on the socket. Lock the chip in place with the locking lever
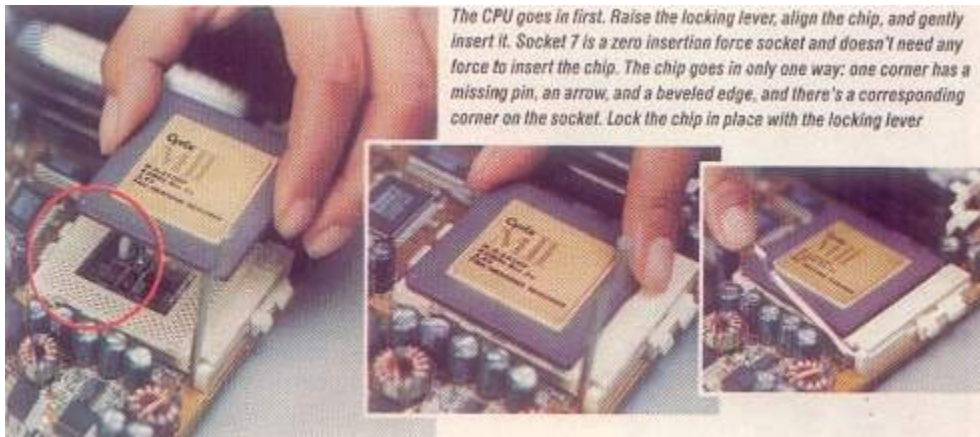
CPU coolers are composed of three parts: A fan, a heat sink, and a mounting device that attaches the cooler assembly to the motherboard directly over the processor.

Installing RAM

RAM goes in next. For DIMMs, open the white-colored locks on both sides of the socket and push the chip straight in. The locks close automatically, locking the DIMM in place. Tighten the locks manually, if necessary

Before actually installing the RAM modules in our computer, check again to make sure that the RAM you have is of the correct type and speed for our motherboard

Keep the RAM module in the slot in the proper way and press downwards. Be careful not to jerk the RAM while pushing it down. See that the lock get hold of the RAM and stay in the locked position.

The ways of inserting the RAM will vary with different kinds of RAM. There are different kinds of RAM like SDRAM, DDRAM, RDRAM, etc.

Screw the hard disk, CD drive, Floppy Drive to the cabinet.

Power Supply

There are two main kinds of motherboards and Cabinets available today with reference to Power Supply - AT and ATX. The have different connectors. They are shown below. These wires come from the SMPS of the Cabinet.

Different Types on Power Supply Connectors

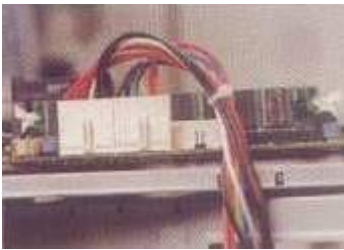|	ATX	AT
Power Spply Type	**ATX**	**AT**
No Of Pins	20	2x6 (12)
Picture		

Power Connections

Identify the type of power supply and insert it into the right place. The AT cables must be connected in such a way that the black cables of both plugs with come together(See Figure to the left.)

These are the list of cables that needed to be connected to the motherboard...

Name of Cable	Device connector of...	No of Pins
IDE	Hard disk, CD-ROM	40
Floppy IDE	Floppy Drive	34
Power Cable For Motherboard	From SMPS to Motherboard	6x2 in AT and 20 in ATX
Front Panel Display	Speaker, HDD Indicator LED, Power LED, Restart	Different for each
Backside Connections	PS/2, USB, LPT, COM 1, COM 2, etc.	Different for each
Card Connectors	CDROM Audio cable, Onboard display to backside cable, etc	Different for each

Besides the cables that are shown here there are other cables like Processor Fan power supply, Power supply for devices like HDD, FDD, CD-ROM etc which are not connected to Motherboard, etc. All must be connected properly.

Installing Hard disk

Ensure that the hard drive is set up to be the master drive on its IDE cable. Each IDE cable can support up to two IDE devices, such as hard-drives, CD-drives, Zip Drives, etc., but in order for this to work, one IDE device must be designated as a master device, and one must be designated as a slave device. You cannot have two master devices or two slave devices on a single cable. This must be later configured in the BIOS. Connect the power supply connector from the SMPS to the hard disk.

Installing Optical Drive (DVD/CDROM)

Ensure that at least one full sized 5.25" bay is open in the case. Examine the jumper settings on the top of the drive, as you did with the hard-drive. Ensure that the drive is set to 'master'. If your case came with rails, screw them to the sides of the CD drive and insert it into the front of the case until it clicks into place. Otherwise, slide the drive into the front of the computer until the faceplate of the drive is flush with the front bezel of the case and the screw holes along the side of the drive line up with the case. Then, screw it in securely on both sides. Attach the power cable (same as the hard-drive power cable) to the drive. Attach your secondary IDE cable to the drive. Note that generally this should be a regular 40-wire IDE cable, not the 80-wire UDMA IDE cable that is used for the hard-drive. Some DVD drives will use the 80-wire cable, however.

Set the jumper on the CD-ROM drive. Here you have a choice. You can either:

- Attach the CD-ROM to IDE connector 1 and make the CD-ROM a slave. In this case, you will set the jumper on the CD-ROM to "Slave" and attach the CD-ROM drive to the same IDE cable as the hard drive. Or,
- Attach the CD-ROM to IDE connector 2 and make the CD-ROM a master. In this case you will set the jumper on the CD-ROM to "Master" and attach the CD-ROM drive with a separate cable to IDE slot 2. In order to use this method, you will need a second IDE cable.

Connect the power supply connector from the SMPS to the CD Drive

One somewhat tedious but vital step in assembling your homebuilt computer is to connect the front-panel switches and LED's from the case to the motherboard. Each switch and LED on the front panel has a connector attached to it that must be connected to the appropriate pins on the motherboard. Unfortunately, there's not a lot of consistency here: To determine the correct pins to attach the connectors to, you will have to consult the motherboard manual or look for the tiny lettering on the board adjacent to the pins.

Time to Double-Check

Before firing up our new computer, take a few moments to double check the following items:

Check all the fans to make sure they are properly connected. Starting up your computer with the CPU fan disconnected may kill our processor!

Make sure that all wires and cables are safely tied away from the fans. Neatness counts. Use plastic cable ties, not metal twist-ties.

Check that all of the power and data cables are securely connected.

Check that all expansion cards and RAM modules are securely seated.

Close the cabinet. Connect the input output devices to the back of the cabinet. Give power connection to the SMPS in the cabinet

Turn on our newly assembled computer. See whether it is conducting the POST. It will give a beep sound after conducting the POST to tell us all the components are connected correctly and properly working.