

# Build a PC

Building a PC is really very simple and doesn't even require you to know how the parts work in order to build one. Don't let others talk you out of it or try to make it sound difficult. In all honesty you can have a new PC sitting on your desktop within 5 hours and that's with going to the store for parts. Of course this is if all your parts are in working order and compatible.

## Build a PC – Electricity - Getting To Know Electronics and Electricity

Dealing with the PC can become a little bit of a danger when you're not looking. Most of the danger seems to reside in you just destroying the PC rather than it destroying you. We need to pay attention to electricity and electronics, what does it mean to you? We will try to answer this and make sense of it all. Make sure you read a little on Electrostatic Discharge at the very least.

### Electrostatic Discharge (ESD)

This is such a big killer in the PC system and anything electronic. You do not want this problem so please take it seriously! When working with any part of the PC except the Monitor you should make sure you wearing a wrist strap. This cuts down on ESD and promotes good health on your PC. When walking across the carpet in your house on a hot summer day you may let out a discharge on the doorknob or even electrocute the dog. I personally like to rub my feet back and forth real fast then touch the wife just for kicks. Of course this can be a bad thing if you touch a CPU and discharge electricity over it, now its history, how much did it cost?

The most dreaded form of ESD is actually lightening. Though it seems harmless it can cause much damage even in a low scale environment such as you home. Your computer case actually has a chemical on the surface of copper fittings to direct ESD safely away. The system case again is very important to your system. When the case is opened up is when your problems begin. Here are some interesting facts about ESD that you should be aware of.

- Most parts in a PC system use 3-5 volts of electricity
- ESD of 30 volts can fry your components
- You can't feel a charge unless its 2500 volts or higher
- A ESD you can feel such as touching the doorknob is around 3,000 volts.
- If you actually see the ESD which most times you can, this carries 20,000 volts.

-As you can tell you can fry your equipment without even knowing it! Wear a strap when possible and be careful in those dry environments.

### Combat ESD

There are other ways to get rid of the ESD problems.

- Antistatic Carpet treatment. This can be bought in aerosol cans for the household. Not a bad idea really.
- ESD bags, most of your electronic parts are stored in these bags and can really help out.
- Ground Pads, this is good if you build PC's or work with electronics much. You can simply touch the pad to discharge ESD prior to handling.

- Humidifiers, are a good route to go with in a dry environment. The air needs to be above 50% humidity when possible.

## **The Real World**

The toughest part of building a PC is not the physical building, it's learning all the information to pick the right parts. Technology is always moving and it's a good idea to read up on new tech from Intel and AMD. All the well known manufacturers these days sell known brand names, I wouldn't recommend a non brand name when it comes to a £1000+ PC, quality speaks for itself, you notice it in TV's and you can notice it in PC's too. Some well known manufacturers are Asus, Abit, Gigabyte, MSI, Corsair, OCZ, Maxtor, Western Digital, Sapphire, XFX, NEC, Sony, to name but a few. Nearly all components prices are of a similar value these days, they all have their different quirks, and rightly so, it's up to them to make themselves stand out from the competition. Researching different manufacturers' equipment using a simple google.com search does wonders for building up a knowledge base. If you want to build and sell PCs as a business, I would suggest you use top notch components and sell your PCs for what its worth. As a buyer take note that a cheap PC is just that, cheap! As a buyer or seller you do not want a return or to be burdened with countless problems.

## **Paying For Performance**

When browsing for a PC you will notice the price of items vary steeply, for example the latest Intel CPU could be £400, but a slower Intel could be £160, you're basically paying for speed. It's nearly the same case in all types of components. Hard Disks you get more storage, Graphics Cards you get faster frame rates in games, CD-ROMS you get faster speeds. While some components have a small price difference for speed improvements, the main components, the CPU and Graphics cards, have a big price difference for the performance gained. This is well known, but not to fear, prices are dropping all the time as new tech is released. Its up to you to decide how much you are willing to spend, and what type of work you will be doing on the PC. Search forums, phone companies etc to see what system they recommend for you. An example might be, if you just want to watch DVDs, type letters, search the net, and play the odd flight simulator, you don't need a £2000 PC to do all this. A PC with a mid range graphics card with a mid range CPU will last you a long time to come, and the beauty of building your own PC is that if you start doing more demanding tasks you can just simply upgrade.

## **Getting Started**

First you need to get an idea of what combination of parts you want to go with? There are many features to add to system and you want the best out there to date. We have put together a decent guide of what you should look for before putting together a PC.

## **Build a PC step 1 - Remove Side Panels And Prepare Case**

To remove the side panels and prepare the case is fairly simple. Look at the back of the case and you will see some screws holding the case's sides on. Be careful not to unscrew the power supply by accident. When removing the cover be careful of any wires that may get caught on case itself. Not to hard is it?

## **Inspect Case And Parts**

Cases these days come with screws to attach components to it, such as hard disks and the motherboard.

They also come with detailed instructions on how to assemble the power supply and info on the removable motherboard tray (if the case has one). Inside the case you will see connections coming from the bottom/top of the case, these are the power/reset/hard disk light/power light connectors. Also either coming from the top/bottom of the case will be more connectors, these are front USB/Sound/Firewire ports. These connectors will be fitted later on so just move them out of the way for now.

### **Pop Out Drive Covers**

On the front of the case there is a set of covers that are for your drives. If you only have one CD-ROM and one Floppy then pop out one big one (5 1/4") and one little one (3 1/2"). This is simple and you can match them up to your drives if needed. If you pop out too many don't worry they go back in. On some case's there are metal plates that protect the backside of these covers. If it is like this in your case then get a flat head screwdriver and work it back and forth until it gives. Not to hard is it? Be sure to read the case manual as some cases screw the drive covers in and you don't want to damage them trying to pull them out.

### **Match Motherboard Up**

New cases come with a pre-fitted I/O plate (the back of the case where peripherals plug into), nine times out of ten this plate will not fit your new motherboard. Motherboard manufactured include a I/O plate to fit the motherboard so that will need to be fitted. It's a simple case of matching it with the motherboard so it's the right way up, and pushing/un-screwing the old one and putting the new one in its place.

### **Install Motherboard Standoff's**

The standoffs are little screws with a male and female end. One end screws to the motherboard tray and the other end lines up with the motherboard holes so screws can secure the motherboard to the case. Screw the standoffs in the right place and set motherboard on top making sure they all match. Make sure no stand offs are in the wrong place as this could cause damage to the motherboard. If all is good then take motherboard out of case. We need to add some components to it before screwing it in.

### **Install power supply**

Some cases come with a PSU (power supply unit) installed, and some don't. It's usually the higher quality cases that don't include a power supply for various reasons. Every case has a different way of installing the PSU, some have removable PSU brackets that require you to install the bracket to the PSU 1st then the bracket to the case. The case will tell you what is required and it's recommended you read through it first.

### **Build a PC step 2 - Setup Motherboard**

Now we have the job of setting up the motherboard. This is not that complicated but should be done correctly or you will have potential serious problems. Make sure motherboard is on a level surface and on a static bag if possible.

I am sure you have skimmed the motherboard manual and are trying to figure out this jumper stuff. The latest motherboards will require you not to set any jumpers, its all done through the bios. Older motherboards however will have jumpers that could need setting. A jumper is basically a small cap that is coloured. Sometimes they are black, red, yellow, you get the point. What they are for is to set up the board for your particular CPU.

Some common settings are for CPU Voltage and Bus Speed. The motherboard manual will layout what jumpers are on the board and go through each one until you are finished. The manual will lay out the settings for your CPU. Most of the time the jumpers will be 1-2 or 2-3 or even off. This means that you will want to set the cap on jumper 1 and 2 or 2 and 3. This will set a circuit. Your manual will have a detailed description. This can be a hard thing to explain but a simple concept. If you are unsure about this call the manufacturer of the board and they will walk you through it. They are usually more than happy to help you. I can't go through and name jumper setting for your board simply because they are all different.

## **Inspect CPU**

The CPU is the core of the whole PC system. We need to take special care of it before and after installation, it will most likely be the most expensive part of the computer so take extra care when handling it. Underneath the CPU are the pins, and the top side is called the core. Do not touch pins if you can help it. We want to ensure they are not bent or broken. If one of the pins is bent you can fix simply with a small pocket knife. Just straighten the pins until they match up with the rest. If more than two are bent I would consider returning the product ASAP.

On AMD64 and Intel processors the cores are protected, so don't worry if you touch the top side of the CPU, it will cause no damage. The older AMD's (Athlon XP's) however have the core exposed so extra care should be taken. Now assuming all is good you will want to install that little guy, be sure to read the motherboard manual for detailed instructions on how to install the CPU correctly.

Now along with your CPU you should have a heatsink and fan. This is a little piece of metal that has a fan on the top of it. This is required to cool the CPU, without it the CPU would simply overheat and melt in a split second.

## **Install CPU and Heat Sink**

Now you will need to pay close attention to the CPU. On the CPU you will notice one or two corner pins missing. Look closely so not to mistake it. Now look at the motherboard and you will see a socket that obviously holds the CPU. On this socket will be the same missing holes. We want to lift the handle of the socket to the up position prior to insertion. With handle up and CPU aligned with socket simply drop in. This should go in easily and without trouble. At times I have had CPU's that didn't go in easy and needed a little playing with in order to seat properly. If you run into this problem do not force it. If it doesn't seat you may have pins that are bent or the motherboard is faulty. If unsure return the items and replace them with new ones. With CPU seated and secure go ahead and pull the socket handle to the down position. If all went well you are done and glad its over with. Be sure to double check with CPU insertion guide in the motherboard manual

Now you are ready to install the heatsink on the CPU. Most retail heatsink's that come with a CPU have a silicon pad at the bottom, this is to help transfer heat from the CPU to the heatsink. If there is no silicon pad you will have to apply some thermal grease to the CPU yourself. This thermal grease is usually white in colour and will come with your heatsink, be sure to apply only a thin layer to your CPU or it will impede the performance of heat removal. Take the heatsink and sit it on top of the CPU. Get an idea of where you want to mount it. Every type of CPU has a different way their heatsink's mount to the board. Be sure to read the manual as they instruct you on how to install it.

## **Install RAM**

Installing the system memory is easy. Notice on your motherboard some slots that should be DIMM slots. Compare this with your motherboard manual. You should know if you are going to use dual channel memory or single channel memory. Some motherboards do not support dual channel so you put the memory in the slots starting from slot 0 (the far left one). If you are using dual channel, you will need to consult the motherboard manual to see the DIMM configuration, most of the time dual channel is enabled in slot 0+2 or 1+3 (1+3 or 2+4).

To install the ram simply open the locking lugs on the DIMM slot and line up the RAM, the RAM has a notch in it so this has to line up with the motherboard. Push down on the RAM and the locking lugs should snap shut automatically. The RAM is now installed.

## **Build a PC step 3 - Install Motherboard Into Case**

Now with all that mess of installing RAM and a CPU it's time to throw it in the case (not literally). With motherboard aligned with your standoffs simply put the motherboard in. Now pay attention to the I/O shield which your ports go into. The I/O shield will tear easy so be careful. Now with motherboard in place go ahead and use the screws that came with case and screw in snug. Make sure there are no brass standoffs that are in wrong place and not being used. You do not want a standoff touching the circuitry on the motherboard.

## **Hook Up Connections**

With the board in place we will go ahead and install the leads to the board along with the power connector. The leads I speak of are little wires that usually run from the front of the case. They will be marked with speaker, power, and so on. Look at your motherboard manual to see which ones fit on the board. There is usually a block that allows you to plug them on to. If you put them on wrong don't worry. This will not ruin anything, you may not have lights working on the computer and the worse case scenario is the computer wont start. There is one lead that is especially important and that is the power switch. If you are using a ATX board which I pray you are, there is a lead that will plug onto two pins. This will actually work the power button on the front of computer. Plug in lead connectors now.

Now lets plug in the power connector from the PSU. This connector is a 20 pin connector or prongs. This connector only fits one way and you cant screw it up. Simply plug into motherboard using the motherboard manual as a guide. Newer CPU's also require a 12v connector plugged into the board. All PSU's have this connector, it has 4 pins in a square shape and it usually has 2 yellow and 2 black wires from it.

## **Build a PC step 4 - Hard Drive**

On the back of the Hard Drive you will see a power connector and a jumper. The jumper is to set the drive as a Master or a Slave. If you are running one Hard Drive you will want to set this as a Master. Simply take the jumper and set to the pins that note it as a master. Real simple just look at the back of drive. Pins are in a vertical fashion. Set jumper over pins and you are ready to slide that puppy in. New SATA drives don't require you to set any jumpers, and new ATA133 drives auto sense master and slave settings.

In the case you will see most of the time a place that is marked HDD and FDD. This means Hard Drive and Floppy Drive. If you have an ATX minitower the hard drive will more than likely install on the bottom drive bay of the case. This is so on most modern towers. You will want to install the drive by sliding it in the bay with connectors facing the back of computer. With Hard Drive installed simply take at least four screws and snug it down.

## **Floppy**

This is about the same as Hard Drive. You will not have to worry about the jumper setting though. Simple slide the floppy in through the front of case in your desired spot. Make sure that the front of drive is flush with case. This is purely for cosmetic reason only. Tighten floppy down from the inside of case.

## **CD-ROM**

You will have a jumper on this one also. Depending on the number of hard drives, and the number of CD-ROMS you have, the master and slave setting will vary. If you have two hard disks, they will be on a different IDE channel to the CD-ROM, as each IDE channel can only support two components, so you set the CD-ROM to master. Now take drive and slide in through front of case and screw it down snug. Again make sure that the CD-ROM is nice and flush with front of case for cosmetic reasons.

## **Build a PC step 5 - Install Adapters**

Now that your drives are in and ready lets put in those pesky cards.

You should have a sound card, modem, video card. Now this is similar to installing the memory modules. You need to look at what expansion slots you have. Here is a little description in case you need it.

**PCI Slots-** this slot is white and fairly small.

**AGP-** this slot is similar to the PCI but is closer to the CPU and is brown in colour. This will house your Video Card only!!

**PCI Express x16-** this is new and latest slot on the latest/newest motherboards only, it is a long slim black slot that holds the PCI-e graphics card.

**PCI Express x1-** this is the new type of PCI slots for add on cards, there are not many as at the time of writing this but it's something for the future.

Match your cards with the expansion slots. The cards themselves will have a description of its format PCI, AGP etc. Simply decide which slot you want to use and remove the medals expansion covers from case. Push card in evenly until it seats.

Screw card down snug.

If you bought a AGP video card it will only work on the AGP slot so don't worry about putting it in the wrong place. It is keyed to fit there only and you will be short of room for it in a PCI slot. Also as another note about installing the cards. If the card doesn't seat flat against the case don't screw down to tight. This is just slack in the card itself. Just snug it and you will be fine. The main thing is that the card is seated in the slot and you don't want it to move up or down in the slot.

## **Hook It all Up**

Now we need to hook up all the IDE cables and power. This is a spot that you can mess up easily if your not paying attention. The cables have ends that are slotted and simply push into the back of your drives and then on the motherboard.

### **CD-ROM/Hard Drive**

Now you will notice a cable that came with the motherboard. You should have one that is slightly bigger than the other. If you are using one hard disk as master and 1 CD-ROM as slave you can use one ribbon cable if it is long enough to reach both drives and the motherboard. Go ahead and find the primary IDE controller. This is a slot on the motherboard. The blue connector goes to the motherboard and the middle one to master and the last one to slave. The ribbon cable will go in one way unless forced. You will notice a notch cut into the slot and a notch on the cable itself.

Plug one end of cable into the CD-ROM (follow notch). There is a red line on the cable itself and usually points toward the power hook up on the drives. Again follow the notch of the drive. Now with that plugged in, follow cable to the hard drive. You will use the same cable to plug into the hard drive. Again follow the notch and make sure the red line points to the power hookup of drive. With Hard Drive hooked up take the end of cable and plug into the motherboard. This again is notched and plugs in one way unless forced.

### **Hook Up Floppy Drive**

The floppy is the same as the rest. The problem is the cable is not always slotted for easy installation. I have found that connecting it like the rest usually works. Just pay attention the red strip on cord is facing the power connector of the drive and the other end of cord is like rest on board. You will see when you get there what I mean. The floppy controller is usually around the other IDE controllers. Its slot is smaller than the rest. Refer to your motherboard manual again if unsure of the slots location.

### **Hook Up Power Leads**

Now that you are getting overcrowded with wires and cords we need to hook up power to the drives. From the power supply you will see a string of power leads. One string may have 3 or more power leads on it. Take notice of the leads. They are keyed one way so as not to install wrong, but they can be installed wrong if forced. Pay attention to the shape of lead and the back of the drive. Simply push the power lead into the drives connector. Now take note that the floppy power connector is different and is smaller so don't freak out if you can't find the power lead. Simply find a free connector for the floppy and your done.

Also from the case there might be USB ports, sound, and firewire wires. These plug directly to the motherboard, if the cables are not fitted together already, each wire will have a label on it saying what it is. Refer to the motherboard manual to see where these go.

## **Build a PC step 6 - Hook Up Peripherals**

Normally I would say close the case and then hook up the peripherals but this is the real world.

Unless you're perfect you have screwed up somewhere that will make it necessary to access inside of computer later. No offence of course, but it happens and its usually small stuff that gets you.

### **Mouse**

Your mouse will plug into the back of the computer along with everything else. You will notice small ports in the back where they fit in and noted by the I/O shield. Simply plug the connector into the USB port or PS/2 (usually green).

### **Keyboard**

The keyboard is like the mouse and usually hooks up next to mouse (usually blue) Plug in snug and that's it.

### **Printer**

The printer uses the parallel port that is noted on I/O shield. Plug in and secure with the small screws on side of plug.

### **Sound**

You may want to hook your speakers and microphone into sound card. This is also noted on the back of sound card for the plug in's.

### **Monitor**

Hook up monitor and make sure that connector seats well. Be sure not to jar it too much, you can unseat the Video Card if it has a bad seat or not much of one.

### **Power**

Go ahead and plug power connector into wall and then into the back of the power supply.

### **Build a PC double check**

Now if you made it this far you are ready to crank that little dude up. Before we do this we need to double check the work.

### **Inside Case**

Make sure that all IDE cables are seated and didn't move or unseat while installing other devices. Make sure they are keyed in the right direction and that the red lines faces power connector on drives. On the motherboard side the cable will be slotted to go in one direction.

Check all power connectors make sure they are seated.

Check all wiring and make sure they are out of way of any fans of sides of case were they may be caught.

Make sure all drives are snug and tight.

Make sure there is no play in motherboard itself and it's snug.

Double check back of motherboard plate to insure no orphan brass standoff. This can cause a short.

Ensure all add in cards are snug and seated. Make sure RAM modules are seated well and snapped in place.

### **Outside Case**

Double check all external wiring such as mouse, keyboard, monitor, and so on. Make sure they are snug into their connectors and seated.

### **Build a PC Troubleshooting**

Now if you are like me you screwed up somewhere. I will list some common mistakes and the answers. There is no way to list all of them of course. I hope your answer is in here.

Problem: No signal to monitor?

Solution: Check cable is the first suspect. Make sure it is attached to the card and seated correctly! With system shutdown and unplugged make sure Video Card is seated in its slot. Even the slightest movement can make it work incorrectly.

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Problem: Hard Drive or other drives not being found.

Solution: Make sure the IDE cables themselves are installed correctly. Look at the IDE cable itself and take notice of how it is keyed. The red line on the wire should point to the power connector on the hard drive, CD-ROM, and even the floppy. Pay attention to the motherboard and the layout of the IDE connectors also.

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Problem: Floppy drive running constantly.

Solution: Same as above make sure the cable is connected properly.

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Problem: Indicator Lights not coming on, along with speaker and maybe even power button not working.

Solution: Narrow down what lights work if any. Simply turn the leads around on their pins in another direction. You may just have them backwards. Refer to the motherboard manual again to ensure proper placement. If you are not getting power to PC make sure you have the power lead to the motherboard and in right direction.

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Problem: Memory not counting or not as much as I installed.

Solution: Make sure memory is seated correctly!

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Problem: Mouse not working or keyboard not working.

Solution: Make sure they are in the right ps/2 port and not backwards. The system can boot with them backwards and not work correctly.

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Problem: My computer is beeping like crazy! What is this?

Solution: These are error codes. These are not the same for all systems. This indicates an error. See [Double Check..](#)

### **Build a PC first boot - Windows 2000/XP Install**

All you need is the Windows XP/2000 CD in the CD-ROM and set in the bios to boot from CD as the first boot device.

Press a key when prompted to, to start from the CD.

The Windows setup screen will now appear.

Follow the on-screen instructions and soon you will be prompted to create a hard disk partition to load windows onto, create one and format it using the NTFS file system.

Continue to Load Widows

### **Windows 95/98/ME Install**

You will need to have a Windows Startup Disk for either win95 or win98. IF you haven't downloaded them get each of them below. Also I will take you along a route of loading windows 98 that may seem a little strange but I promise it works well and with little work. The main Utility I use is a program from Western Digital. This is to do a High Format and Partition your Hard Drive. What we want to do is boot the system with the diskettes. We will use the Western Digital First. This will do a high format on drive and partition it. Also along with this we will get to load the system files automatically. Cool huh!? In order to do this we need to set the computer to boot at the "A" drive. This is done by making a adjustment to the CMOS.

While system boots and the memory count is over we want to hit the "Delete" key which is most common to enter setup. If you are unsure what key to hit at bootup look on the screen itself for "setup" and the key that corresponds with it. Most cases its "delete" key.

You should see a blue screen or very similar that says CMOS. Look for BIOS Features Setup. You should be able to locate it with the arrow keys of the keyboard. Make selection and hit enter. Now move down to "boot sequence" and choose with the page up/down keys "a,c,scsi" or as close to this as possible.

We want to boot the "A" drive first. Now hit the "ESC" key and choose to exit and save changes. If for some reason you think that you messed up a setting you can also exit without changing settings. If you are still worried and unsure what changes were made choose "load bios defaults" at first CMOS screen.

Make sure the WD Utility is in the floppy (A Drive) and let computer reboot. You will come onto a screen asking to hit enter after reading the agreements. Move forward to installation. We want to choose "Automatic" install, this will scan the drive and get it ready. You will be prompted for your windows 98 startup disk also. This will load some basic boot files onto your hard drive and will see what file formats your Operating System will use. You will be asked if you want to use FAT 32 file system, choose "YES". Let the partition of the drive be all of the drive unless you want to load another operating system along with windows later. This is harder to write about than do, just follow the wizard and do as it asks. This is why we are using it, its easy!

Leave your windows 98 boot disk in the floppy so it will now boot instead of the WD Utility.

### **Build a PC Loading Windows - Loading Windows XP/2000**

Continuing on from the format partition screen you will prompted to select your time zone and keyboard languages.

Name and Organization settings are next, doesn't take a genius to work out what goes here.

You will soon be prompted for your CD-Key, input this and continue.

Computer name follows, along with modem options, input any digit for modem dialing tone as this is not used. Select the correct date and time zone and continue.

Use the typical network settings, with default workgroup when prompted to.

Windows will continue to finish installing.

When windows finishes and reboots you will be welcomed by a "welcome screen", continue and follow the instructions shown.

Windows should now start and all is ready.

The last thing to do is to install the software for your devices, so continue to the next page.

### **Loading Windows 95/98ME**

Okay, with Windows 98 startup disk in floppy drive and computer rebooted and started.

Windows will go through a few steps and you will end up at a "A" prompt. Don't panic you are almost done.

Put your windows 98 CD in drive, give the drive a few seconds to read the CD-ROM.

Okay what we will try to accomplish now is getting a directory under the CD-ROM so we can install windows.

Depending on how you partitioned your hard drive the CD-ROM should be on the D: drive. Most times it isn't while you are in this step it is actually a temp drive and is under E: . This will change later on when windows is actually loaded. Don't let it confuse you, we just have to get the prompt for the CD-ROM wherever it is. This is done by trial and error. At the "A" prompt type D: then enter key. If you get a error type "F" for fail. At "A" prompt again type E: enter. Eventually you will get it. I almost bet it is on the E: prompt for the majority of you.

At your CD-ROM prompt D:?, E:?, F:?, type "setup" then enter.

Windows will go through scandisk and check out your drive. When done hit "X" for exit.

You should be at a Windows welcome screen. Choose continue.

-You will be brought to a wizard.

Now we should be looking at a Wizard with a license agreement. Choose "I Accept".

Enter Registration Key that is located on the Windows 98 case or envelope.

Now you may be looking at a screen to verify you own prior windows media. What you need to do is eject the windows 98 CD and insert a windows 95 CD. This can be borrowed from a friend of course. Browse the windows 95 CD and look for "win 95" folder. After selected hit "ok"

Windows will verify the CD and then your onto windows 98 installation. You will be prompted to put the windows 98 CD back in the CD-ROM drive. Choose "ok" when loaded in the drive.

Choose C: \windows or the drive you want to load windows on. This is the default location for windows.

Windows will now prepare the directory and check for space.

Setup screen, choose custom to add all the goodies you want.

User Info, put in your name and general information.

Now you will be looking at a screen to add the components you want. Go through each category and add all of what you want. If unsure add all of them! You can always get rid of them but you never know when you may want it later. When done choose "Next".

Depending on what you chose you may be at a identification menu. This is for networking. Simply make sure your name is already added and click "ok".

Now we need to give windows our location.

Now windows will prompt you to make a startup disk. You already have one and can actually leave the old one in drive and have it re-written. You cannot skip this step. Make the start up disk.

Now after your disc has been made we will go onto copying files to the hard drive. This is automatic so sit back and relax! Your almost done.

Windows will restart. (Automatic)

Setup Hardware (Automatic)

Setup Time zone, choose your time zone.

System will go through more auto configuration and will setup the start up menu, control panel, and so on.

Enter Windows Password, the best thing to do with this is hit enter with no password in the dialog box. This provides little protection anyway so type nothing and hit enter. It shouldn't appear again.

Hardware Auto Detect. This will look for PnP (Plug And Play) devices you installed on the motherboard.

Personal settings

Windows Starts!!!!!! Your almost Done.

Okay if you made it this far we need to install the PnP device. You may be prompted to install them while windows boots. This isn't always the case. If you are prompted make sure to have the manufacturer disk ready. Now if you find that your devices are not loaded and need to be loaded or reloaded follow the links below.

### **Installing a device driver or software**

Now there are many ways to install a device driver or software for the device. The most common method is through the control panel. I will show you the manual install under windows and the Plug and Play way.

### **Windows 95/98/ME**

Plug and Play-

With windows detecting your new device you have installed you will be prompted for location of the device driver.

In windows you can choose to search for driver or review a driver list windows has set up. The best way to go about this is to have your manufacturers CD/Floppy disk ready and in a drive. Choose "Search for a better driver".

The next dialog box will give you a list of a floppy,CD-ROM, and so on. Choose the installation media type you are using and click "next".

Now when if your unsure of the location of the software on the disk is usually in a INF. file type. Also look in any corresponding folders for example win95 or win 98 and even drivers. Refer to your software documentation if you can't find it. Windows will also tell you if there is information about your device in the next dialog box.

Now that you chosen the drive simply hit "ok" of "next".

If you found the right driver you will see a dialog box with the new information in it. Hit "next" or "ok"

Windows will build a database of needed drivers from the one you selected and you will need to reboot.

Your installed.

## **Windows 2000/XP**

When a new device is installed in your computer windows will automatically detect it.

Windows will either find a driver for the device and install one on its own or it will ask you for drivers for it.

Cancel this, grab the manufacturers disk, and put it in your CD/DVD drive. It should auto start and then show a list of install options. Simply click install to install the device drivers, at the end a reboot would be required. After this reboot the device should be operational.

If the manufactures disk doesn't have an auto run program and just simply provides the drivers on the disk, then you must not cancel the screen when it asks you to install the drivers. Instead click next. You can now do it two ways, let windows install the device automatically, or if you know where the drivers are you can select them manually. Windows recommends the first option and I agree, this should be used first, and if it doesn't succeed use the second option and browse the CD for the driver.

## **Manual Install**

Windows 95/98/ME

There are times when you need to manually install a device rather than use a wizard. This is easy and still uses a little bit of the wizard to accomplish this task.

From the start button on windows click settings, control panel, systems, click device tab.

Choose your device under the device tab and double click it.

Choose Driver Tab

Choose Update Driver

Choose "Search for a better driver".

The next dialog box will give you a list of a floppy,CD-ROM, and so on. Choose the installation media type you are using and click "next".

If your unsure of the location of the software on the disk is usually in a INF. file type. Also look in any corresponding folders for example win95 or win 98 and even drivers. Refer to your software documentation if you can't find it. Windows will also tell you if there is information about your device in the next dialog box.

Now that you have chosen the drive simply hit "ok" or "next".

If you found the right driver you will see a dialog box with the new information in it. Hit "next" or "ok"

Windows will build a database of needed drivers from the one you selected and you will need to reboot.

Your installed.

## **Windows 2000/XP**

Manually installing a driver is easy, you will need to manually install a driver for various reasons, the main one is driver updates.

Go to start>control panel and click systems. Go to the hardware tab and click device manager. Look for the device you want to update the driver for and double click it. Go to the driver tab and click on update driver.

A screen will pop up like in the automatic install. Select "install for a list or specific location" this time and click next. Uncheck "search removable media" and check "include this location in search". Click the browse button and go to the directory where you saved your new driver. (if it's on CD just search removable media and it will find it).

Click next and it will attempt to install the driver. Once done click next and your new driver is install. A reboot might be required for the device to work properly.

## **Easy Install of Software**

Lets say you bought a game and really wanted to play it. How do you install it into Windows? Mainly this is done by simply putting the CD in the CD-ROM drive while the computer is running and it automatically starts up. But sometimes it doesn't work like that.

From start menu click settings, control panel, add/remove programs.

From the add/remove programs dialog box choose "install". Make sure your software media is in the drive.

Choose next so Windows can detect your software.

If all goes well your Windows will find the setup.exe file and choose "ok" or "next".

Now what if windows didn't find it? We need to take a look at the disk itself and hunt it down.

From start button, click programs, go towards bottom of list and click "Windows explorer".

In Windows explorer choose the drive were your installation disk is.

Now simply browse the disc for a execute file such as "setup" or "install" as an example. This should work. If not refer to your manufacturers directions.

## **Uninstall Software**

Removing programs really upsets people. What happens is they remove a file or a shared component that causes all kinds of errors in other programs. Now what happens for the most part is you will call technical service and they direct you to format your hard drive. This should never need to happen if you are careful. Now the best way to uninstall a program is through the control panel.

From the **start** menu choose **settings, control panel, add/remove** programs.

Choose you program to be uninstalled from the list.

Click **add/remove**

You will be prompted "do you really want to remove"

Choose **yes**

Windows will automatically uninstall the software.

Now, if asked at anytime about deleting a shared drive choose to keep it. It wont hurt anything! The bulk of the program will be removed saving you a lot of heartache.

### **Manual Uninstall**

If your program wasn't in the list try looking for an uninstall that came with the program. This can be done by looking at the folder for your software.

At windows start menu click programs.

Choose windows explorer under programs

Look under you C drive or where ever your primary storage device is.

Find folder and double click it.

If there is a manual uninstall in the folder choose it.

Now if now uninstall program in your folder and add/remove programs didn't work you can delete the files in the folder.

Now before we go into the deleting of files let me make something clear. When deleting files DO NOT delete any driver files if you are unsure that other Windows programs use them on a shared basis. If unsure the best thing to do is keep them.

Click on the files you want deleted or even the whole folder if you know that Windows doesn't use the drivers in it. With folder or file highlighted right click on it. You will see a command that says delete.

Choose "delete"

You will be asked if you want to delete this file.

Choose "Yes"

Your file will be sent to the recycle bin that is located on the desktop.

Let your computer run for a few days and if no trouble you can safely go to the recycle bin and dump it. If you think that you erased something important you can go to the recycle bin and choose to Restore the files.

Keeping your recycle bin contents intact for a few days is a great safeguard against future problems.

## How to of Case and Power Supply

### Case

The case doesn't require much handling or installation. There are a few details of adding feet but nothing that you can't figure out with common sense. The biggest problem is just getting it ready for the motherboard which isn't all that difficult.

### Power Supply's

So you probably figured out that your power supply is no good or just want another one with more wattage? Well you are at the right place. The power supply is a fairly easy to install and doesn't get much easier than this.



Uninstalling A Power Supply

Now first thing make sure and mark any wires you remove from motherboard so you can match them up later. This can be the hardest thing to do. If this is a clean install then you are in good shape. If you have components in the case go ahead and take note of what is plugged where. If you are installing an ATX power supply you will have a single 20 pin connector to the motherboard, and also a 4 pin 12v connector (square one). Not hard to miss. Now, pay attention to your drive leads, These are what plugs into the your drives. The order they go in and come out is not critical so don't worry about marking them. Mainly try to make yourself familiar with the power connector's for the motherboard such as the 20 pin and 4pin 12v (square one).

-20 Pin ATX power connector. This will plug into the motherboard. Notice how it is keyed to go in one way.



The 20 pin ATX connector

### Steps

1. Unplug current power supply
2. Loosen the screws that retain the power supply. You should also remove the case's cover for this.
3. Slide power supply out through back or case or from inside. This depends on how the case is made but it easy to recognize. Also you may have a lead attached to a power switch. Undo and make sure you mark down how the leads were set so new power supply will match.

4. Take new power supply and ensure it is switched to 115 if in US.
5. Slide new power supply into case.
6. Secure new power supply with screws that came with it.
7. Take new leads and reattach as original assembly.

You may find that the colour coding isn't the same or varies slightly. Check with your documentation that came with power supply or call vendor to insure a proper fit electrically.

### **Installing the video card**

Installing the Video card is not much different from anything else. First you need to determine which bus the card uses such as PCI PCI-express or AGP. The most modern is PCI-express, but with near no performance advantage over the same card in AGP, it's not essential to change your whole motherboard just for PCI-express. This guide is for AGP cards.



The video card



Back of card and its connection

Now lets get it in the computer and installed.

Unplug computer, and ground yourself.

We need to remove the case cover first.



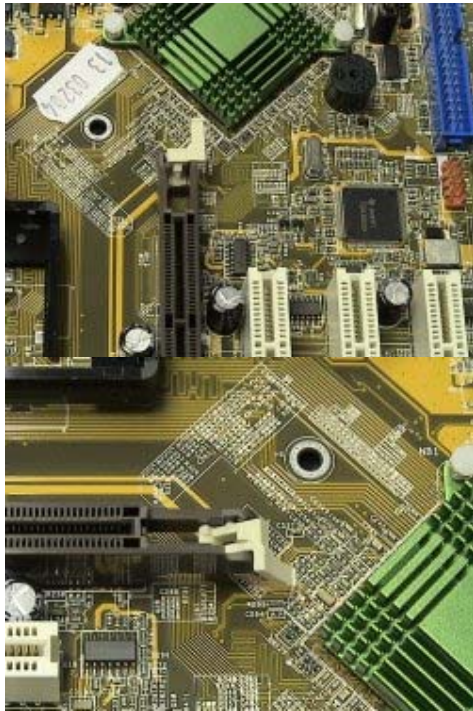
Unscrewing the case



Slide case panel off the case

Locate slot type you need. The AGP is usually a brown coloured slot close to the CPU. The PCI is a slot very similar to the AGP except it is white in colour.

Some motherboards have a lug at the back of the AGP slot, this lug has to be pushed down to allow the AGP card to fit in the slot.



AGP lug closed. Card cannot be installed.

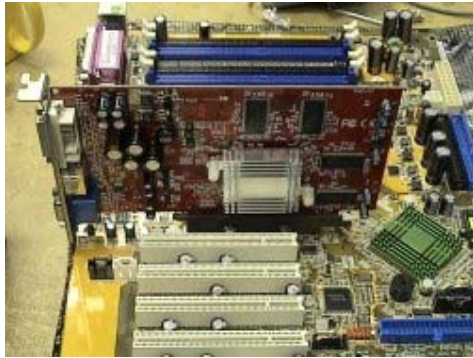
AGP lug open. Card can be installed.

Install Card into slot. Push firmly from both side and evenly, the lug should pop up, it might not pop all the way up so just move it up manually if it doesn't. If the card is having a hard time getting in simply push in a little from front then to back. If you are still having problems, loosen the motherboard so you have some play in it. This can be a real help at times, especially in a new installation.



Installing an AGP Video Card

Now with card in let's tighten it down. If you loosened motherboard make sure and tighten it up after securing card.



Card installed. NB: This motherboard is not in a case for review purposes. Make sure you screw the card to the chassis.

Now close case and reboot computer.

Windows should detect card especially if it is plug and play.

You will be asked for a driver for this card. Make sure you have the installation disk ready (or see below).

If its an Nvidia or Ati card (which it most likely is) press the cancel button when prompted to install drivers for your card. Download and install the latest drivers from the manufactures website or simply install the driver provided on the CD. Make sure any old drivers are removed before install new/updated drivers, this is done via add/remove programs in control panel.

That wasn't so bad was it?

If you ran into problems with installation try going to start, settings, control panel, and then add/hardware icon. If you need a more detail lesson in installing a Device Driver click [here](#).

### **Installing devices - Sound card**



The Sound Card

The back of card and its connections, notice the firewire port on the far right. NB. joystick port is connected separately.

Installing the sound card is like any other device. It simply plugs in and your on the way. There are a few simply steps to take and your installation is over. Lets get with it.

First, make sure your grounded well. Make a habit of touching the power supply every so often to discharge any static electricity you may have built up.

Unplug power from computer

Undo the case a little. This can be done by removing 2 or 4 screws on back of case.



Unscrew the case

Slide case panel off the case

Identify your Card type and the slot it will use. Most cards run on a PCI slot. If you are using an ancient machine you could well have an ISA slot. ISA slots were phased out many many years ago and are now non existent, but still it's best to double check what slots you have on your motherboard.

Install the sound card like an other expansion card. Line it up and push down. It should fit with no problem.

Tighten Card Down

If you're having problems with the card push in from front side a little at first then to the back. Just wiggle it in a little then push in firmly from both sides till card seats.



Tighten card snug and screw it to the chassis

Now close case and reboot computer.

Windows should detect the card especially if it is plug and play.

You should have with your sound card some driver disks, use these to install the sound card. Follow the included manual for the sound card for details on this installation.

That wasn't so bad was it?

If you ran into problems with installation try going to start, settings, control panel and then add hardware icon.

## How to Install Memory

Installing memory is really a breeze so don't worry to much over it.

Now, lets put them little guys in. If you are unsure about the memory you have check with your manufacturers specs before proceeding.

The memory used for systems now is DDR ram, they come in all different speeds and you will need to check the FSB on your CPU as to what memory you can buy. You can buy PC3200 memory for a CPU running at a slower FSB, the memory will just run slower, but the bonus is if you ever upgrade your CPU the memory can FSB increase.

If you would like more information regarding memory check out the memory [\[Guide\]](#)



RAM Installed

1. Unplug your computer
2. Remove the system case cover
3. Locate the DIMM slots (refer to the motherboard manual on information such as slot arrangement and dual channel)
4. Open the locking lugs at either end of the memory slot. Line up module with slot. This can be a pain so use a flashlight to see the module's slot. They only go in one way so take your time and don't force it.
5. Push firmly on both sides of the module till it seats. The locking lugs should snap closed, if not just simply do this manually so they hold the ram securely in place.
6. Close system case and boot up
7. You should see a memory count on POST (power on self test)

That wasn't so bad now was it? Should you have run into problems, make sure modules are seated properly.

## Installing Devices - Hard Drive/Floppy

### -Hard Drive-

If you are just plain tired of the drive you have and feel that you have outgrown it, it may be time for replacement. Most of us will want to back up the information before changing over or even throwing information from one drive to the other. Now we need to figure out what steps to take before we put our new drive in.



## The Hard Drive

Back up, you will want to back up your data onto some source such as a CD-Writer, Tape backup, or even a Jaz drive. This will save you time later. I promise.

Choose a space, find a spot in the case you will want the drive to reside. Make sure its a place were the drive can get plenty of ventilation. Modern cases have their drive bays situated behind a fan of some sort to aid in the hard disk cooling. This is really important if running many drives.

Hard disks come in two styles now, the newer SATA and the older ATA. There wasn't much difference until recently between SATA and ATA. Now improved firmware integrated in SATA hard disks improve the speed over ATA drives, also with the new SATAII disks starting to come out the woodwork, there is a boost for even more speed. Native SATA dives only accept SATA power that newer power supplies have, if not you can buy converters. A few SATA and all ATA drives take the standard 4 pin power connector that every power supply has in abundance. As well as different power cables, the data cables are different also, the pictures below shows the size difference.



IDE data cable



SATA data cable



SATA power converter



Case is already marked for a hard drive.  
Find a similar bay in your case if possible

Check Cabling, ensure the cables on your drive are in good shape and new. Its not a bad idea to replace the old cable on your existing hard drive. Make sure also that you have a spare power lead from the power supply.



Replacing and installing IDE cable to hard drive

Setup the drive, if its to be a slave to another hard drive set the jumper accordingly. Look at drive documentation for more information. NB SATA drives can only be set to master/have no jumper as they have their own SATA port.



Take note of the jumper on the hard drive,  
set to master or slave

### The Steps

Turn the computer off and unplug it from the wall or power supply.

Open the case by removing the screws and slide off gently.



Unscrewing the case

Slide case panel off the case

Slide hard drive into the spot you picked.



Slide hard drive into bay

Match mounting holes up

Secure drive with new screws that came with it.



Tighten down hard drive

Plug in IDE cable. (line up the central notch on the cable with the back of the hard disk for the cable will not go in). If only one hard drive then just plug cable in from main IDE slot to the controller on back of hard drive. IF you are slaving the hard drive hook it up with ribbon cable of other hard drive. Make sure you have one set as the master and the new set as slave or vice versa. The IDE cables are also marked with a notch so to go only one way. NB SATA drives can only be set to master/have no jumper as they have their own SATA port.



Plugging in IDE cable to back of hard drive

Plugging in IDE cable to motherboard

Plug in power connector.



Hard drive (left) and Floppy drive (right)  
power cables

## Boot up

While in boot hit the "delete key".

Go to your CMOS , look for drive settings. Make sure they are on AUTO for now. IF your system doesn't support AUTO then you will need to enter the values of your hard drive into CMOS. This can be done by referring to your manufacturer manual.

If this new hard disk is being used a system without another bootable hard disk, then when you install Windows XP you will be forced to create a partition and format it, and then continue installing windows.

If you are adding a new hard disk to an already setup and bootable hard disk, there is a program you can install in windows to configure the other drive. The program is called DiskWizard and is found on Seagate's website. It can convert the new drive to the new C: drive (bootable) or simply add it as a second hard disk, it partitions and formats in one go. The program can be found on the Seagate website.

## Floppy



A floppy

Installing the floppy is pretty easy and doesn't take long. For the most part you can simply replace floppy and turn computer back on without trouble. Most of the drivers for it are generic as is.

Turn computer off and unplug it from wall or power supply.

Open case by removing screws and slide off gently.



Unscrewing the case

Slide case panel off the case

Slide floppy into existing spot.



Slide floppy in through case front

Secure drive with new screws that came with it.

Plug IDE cable to drive and into motherboard.



Backside of floppy

Plugging in IDE cable to motherboard. This connector is smaller than the hard drive connector

Plug power connector into drive.

Reboot

You shouldn't have any problems with this especially if the system supports AUTO detection which most newer systems do.

## Installing Devices - CPU

(

### Installing A CPU

-Installing a CPU can seem a little over your head but it isn't. It's actually easier than many components. The installation will probably take you 10 minutes with no problem. CPUs were all similar up until recently. All AMD CPUs have pins attached to the CPU, Intel socket 478 CPUs also have the pins attached to the CPU. However, the new Intel socket 775 CPUs have no pins on the CPU, only holes, the pins are located on the motherboard itself. Intel chose this path for various reasons, mainly due to the fact the 478 "Prescott" processors produced too much heat.

The AMD and Intel 478 sockets are small square objects with gold pins on the bottom, and a lever to one side. The CPU will simply drop into the socket with the lever up and lock into place when the lever is down. Doesn't get any easier than that.

-AMD Socket (Also similar to Intel 478)



ZIF Socket

-AMD CPU (Also similar to Intel 478)



AMD CPU, notice notch on CPU

Install-

First ground yourself. You do NOT want to allow a static electricity discharge on your new CPU. It will fry real quick! Make a habit out of touching the power supply in the case to discharge any amount of static electricity you may have.

Unplug computer

Open Case by removing screws. There are approximately 4 of them to remove.



Unscrewing the case

Slide case panel off the case

After figuring out what CPU you have we need to install it. In this tutorial we install an AMD socket 754 CPU and after the new socket 775 Intel CPU.

### **Socket 754**

First off pull the sockets locking handle into the up position.



Picture same as above. Notice handle in UP position

Now we want to place the CPU in the ZIF socket. The CPU is notched at one end and is also notched on the ZIF socket. Simply align these.

Make sure your CPU is matched up with slot and let it fall gently into the slot. If it wont slide in well then check pins on CPU to insure they are not bent. If one is bent you can use a pocket knife to straighten carefully. Be careful! If many are bent, take back to store and get a new one.

Now with CPU in the socket we need to lock it down. Push the handle all the way down and secure under its retainer.



CPU locked in place

Now we need to install the heatsink and fan. This is an easy job too though.

Around the socket there will be a black device that holds the heatsink down on the CPU, this is called the heatsink retention bracket. The heatsink itself will have two hooks on each side, with one side having a device that locks the hook in place while locking onto the retention bracket. Make sure the device is unlocked but turning it anti-clockwise before starting.

Hook one side of the heatsink to the bracket and then lower the heatsink on the CPU. The other side of the heatsink should be able to hook into the bracket now also. The heatsink should feel firmly in place but the hooks will be loose. The final step is to move that locking device clockwise till it locks into the retention bracket, this should make the heatsink secure.

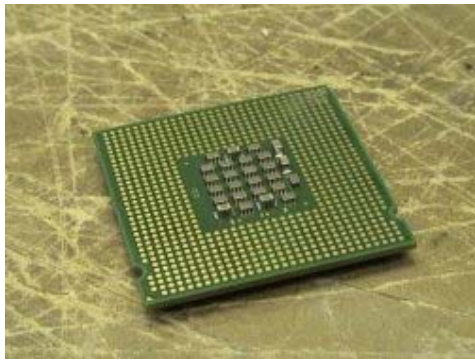


Installed HeatSink and Fan

You're Done!! Good job.. That wasn't so bad now was it? There is only one thing left to do and that is to hook up your CPU fan into a available power connector. Your BIOS should see new CPU and show it to you on the POST process.

### **Socket 775**

As mentioned earlier Intel's new socket has its pins integrated with the actual socket and are not located on the bottom of the CPU. The new CPUs look like this:



Look no pins!

The new socket has a protective cover on it to stop the pins being damaged. This will need to be removed first of all.



Socket 775 with protective cover on.

Once the cover is off open the lever and lift up the metal flap. This reveals the pins and allows the CPU to be installed.



Socket open and ready for CPU to be inserted.

As with all CPUs remember to look for the notch in the corner and match it up with the socket. Gently lower the CPU in the socket taking care to not bend any motherboard pins, and then lower the metal flap. Finally move the socket lever to the closed position to lock the CPU in the socket.



Socket closed with CPU installed, ready for heatsink.

The CPU is now ready for the heatsink to be installed. This board is different in that it doesn't have a retention bracket. The heatsink simply slots into four holes. It is locked into place by twisting the four locking clips. Simply done.

### **Installing A Modem**

Modem installation usually goes smoothly. The hardest part is finding the drivers available on the installation disk. This is usually in the form of a INF. file. This simply gives the system information on your device or modem. If you have a Plug and Play modem you should be in good shape for a installation. When you boot up the computer will find the modem and you're in business.

### **Installing an External Modem**

Installing a external modem has its advantages over the internal. I have had modem simply lock up on me and not work. When this happens with an internal modem this usually calls for a reboot. With the external you can most times just turn it off and back on to reset it. This can save you a little heartache at times. Not only is the external modem handy but you can travel with it and hook it up to other systems. The internal modem is not so handy for such operations.

Here are some common steps for installing an external modem.

1. Turn computer off.
2. Plug modem into a free serial port.
3. Plug modem power in and hook up phone line.
4. Restart system, you should go into a plug and play routine with windows.
5. Your system will recognize your new hardware especially if is PnP (Plug and Play) device.
6. In most cases you will be brought to a hardware wizard under windows and it will ask for a driver for your device.
7. Make sure you have the installation CD or floppy in the drive.
8. Browse location for what is called a INF. File, this provides information on your device and will help load device.
9. Simply choose location of INF. file and hit ok or next. This should load the driver for device and your in business.

## Internal Modem



The  
Modem.  
This is  
a 56k  
PCI  
Internal  
Modem.

This installation is very similar to the above installation. We only have to plug card into the inside of system then boot up. After installing card and booting refer to step 5 above in external installation.

Shut computer down and Unplug

Open case by unscrewing it.



Unscrewing the case

Slide case panel off the case

Make sure you are grounded, touch power supply ever so often to discharge any static electricity.

Find an open PCI slot or whatever your modem calls for. This is usually a PCI slot. This is a small white slot.

After locating slot, remove existing expansion card metal slots keepers. This is so the card can fit in the slot and the case

Push modem in firmly from both sides and evenly.



Installing Modem

When card seats tighten down snug.



Tighten Card Snug

Plug any phone lines you may have. One is all you need for an existing phone line unless you want to use your telephone with modem.



Back Side Of Modem, Notice Connectors

Refer to step 5 above

Installing a modem is not hard. The biggest part is really just getting the software on. Some modem software is easier than others. Take your time. If you think that you may have done it wrong and want another way of installation, try going into add new hardware wizard in windows.

**Start, settings, control panel** and then **add/hardware** icon.