

PC MOTHERBOARDS

The motherboard is the board that contains the logic circuits that tie all parts of your PC together. It provides the connectors for the CPU, the memory, BIOS, CMOS, Video devices, sound devices, storage devices, chipsets, etc. in order to form an integrated set of components.

Here is a list of WEB sites of motherboard manufacturers you can check out:

- www.micronics.com
- www.asus.com
- www.abit.com
- www.Aopen.com
- www.Soyo.com

The motherboard has each of the following components, and a lot more. the problem is to tell you where each of them are:

- ISA Expansion Slots (long black slots usually at upper left)
- PCI Expansion Slots (mid length white slots usually in middle)
- CPU Slot or Socket
- Memory (SIMM) bank (white slots with 72 pins).
- Memory (DIMM) bank (gray/black slots with 168 pins).
- External Cache Slot (L2)
- ROM Chip (BIOS Chip)
- Multi I/O
- Chipset and more

The motherboard also contains other components such as BIOS chips, the CPU clock, cache chips, bus, etc. To see every detail, you will need to get a "User's Manual" for the specific motherboard you have, and to locate all components on the board. The bus is actually a set of circuits that run throughout the board and connect all the expansion slots, memory, and CPU, etc. together.

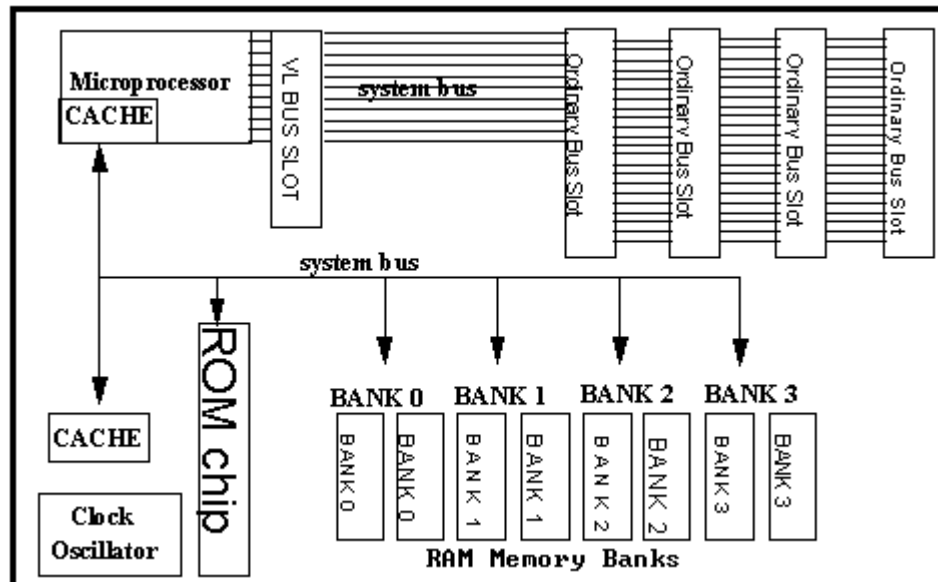
Motherboards sizes are as follows:

1. Standard AT = 12" w x 13.8" long
2. Baby AT = 8.57" w x 13.04" long
3. LPX = 9.0" w x 13.0 long

4. ATX = 9.6" w x 12.00 long

Sizes are important if you are replacing an existing motherboard!

The ATX is the Intel specification released in July 1995. It has become the defacto industry standard for motherboards. The following drawing will help you to visualize the bus:



The motherboard components serve specific functions:

- BUS - connects all the components of the computer and provides a path from device/controller to the next component.
- Expansion Slots - for connecting other devices/controller cards to the motherboard.
- Memory Slots - provides receptacles for adding additional memory chips (SIMMs, DIMMs, or other types of memory).
- ZIF Socket - provides a location to insert the heart of the computer - the CPU.
- BIOS Chip - provides a definition of the system for booting.
- USB Port - some newer machines will have a port for the Universal Serial Bus (USB) connection.
- Chip Set - controls most of the capabilities such as type of memory, I/O, etc.

Purchasing Considerations

1. DOES the CPU Slot support CPUs other than Intel! If you want to use CPU's other than the PENTIUM II you will need to select a motherboard with "Socket 7" compatible CPU port. Intel Pentium II CPU's interface to the motherboard with a Single Edge Contact (SEC) connector. You cannot put a Pentium II in your older motherboards.

2. A 'Universal Serial Bus' port - for the future. There will probably be a few USB devices available by late 1998 - that is a guess! Since things change so fast, you may not need it now because you expect to purchase newer computers periodically.
3. A large memory capacity, with 72-pin SIMM slots, and if possible some DIMM slots. The more SIMM and DIMM slots the better for the future. The 'chipset' on the motherboard also determines how much memory can be supported - Intel 430FX only supports 128MB, while a 430HX supports 512MB. Well, let's be realistic - a motherboard manufacturer will put a chipset that can support all the memory slots on the board up to a point. However, you must make sure that the chipset will support the maximum amount of memory you desire.
4. A large L1 and L2 cache (CPU integrated if possible) design for the CPU. Some systems have both L1 and L2 in the CPU and they operate at the CPU clock speed, while others have the L2 external to the CPU and it operates at a slower speed usually 66MHz.
5. A large number of 'expansion slots'. Don't buy a motherboard with only 4 available slots. Some MB's have a set of ISA and PCI slots, others have EISA and PCI slots. It is your call, there are lots of ISA cards still around, and fewer EISA cards and there is probably less EISA interface software available. But EISA should be faster than ISA. PCI slots are a must on any motherboard!
6. A high speed CPU bus speed; PCI Local bus, or a VESA Local Bus; and if possible, a high speed bus for the expansion slots.

The Intel chipsets will run at 75 and 83 MHz, or so I hear. So, if you have a board that accepts the "Socket 7" or is it "pin 7" CPU, you should be able to run a CYRIX or AMD CPU on the board.

7. Does the Motherboard have different voltages levels for different CPUs? The different manufacturers, Intel, AMD, CYRIX, etc. may use different voltages ranging from 3.53 volts single voltage down toward 2.5 volts dual voltage. I am not an engineer, but I know that higher voltages create different levels of heat, and lots of heat must be dissipated.
8. Which RAM types do you want? If you plan to add more memory in the future, you may want a board that supports FPM, EDO and SDRAM memory.
9. You want a MB with chipsets that allow you to "cache" large amounts of your memory. If you increase your memory beyond the limit of the "cachable" amount, you will take a "hit" - your overall performance will decrease.
10. Do you need features such as "Advanced Graphics Bus (AGP)"?
11. Do you need a "multiple" CPU system? For a desktop administrative machine, you probably don't need one; however, for network servers it is possible that you have need for one. Large multimedia applications may be a reason to purchase a multi-cpu PC.