

How Motherboards Work

A motherboard is at the core of every computer system. In desktop models it usually lines the floor of the system. In tower and mini-tower models, it lies along one of the sides. A motherboard's components and features define a PC's potential and upgrade path. Virtually every essential computer part, data bus, or electrical subsystem attaches to the motherboard in some way. If the motherboard fails, the computer will not function.

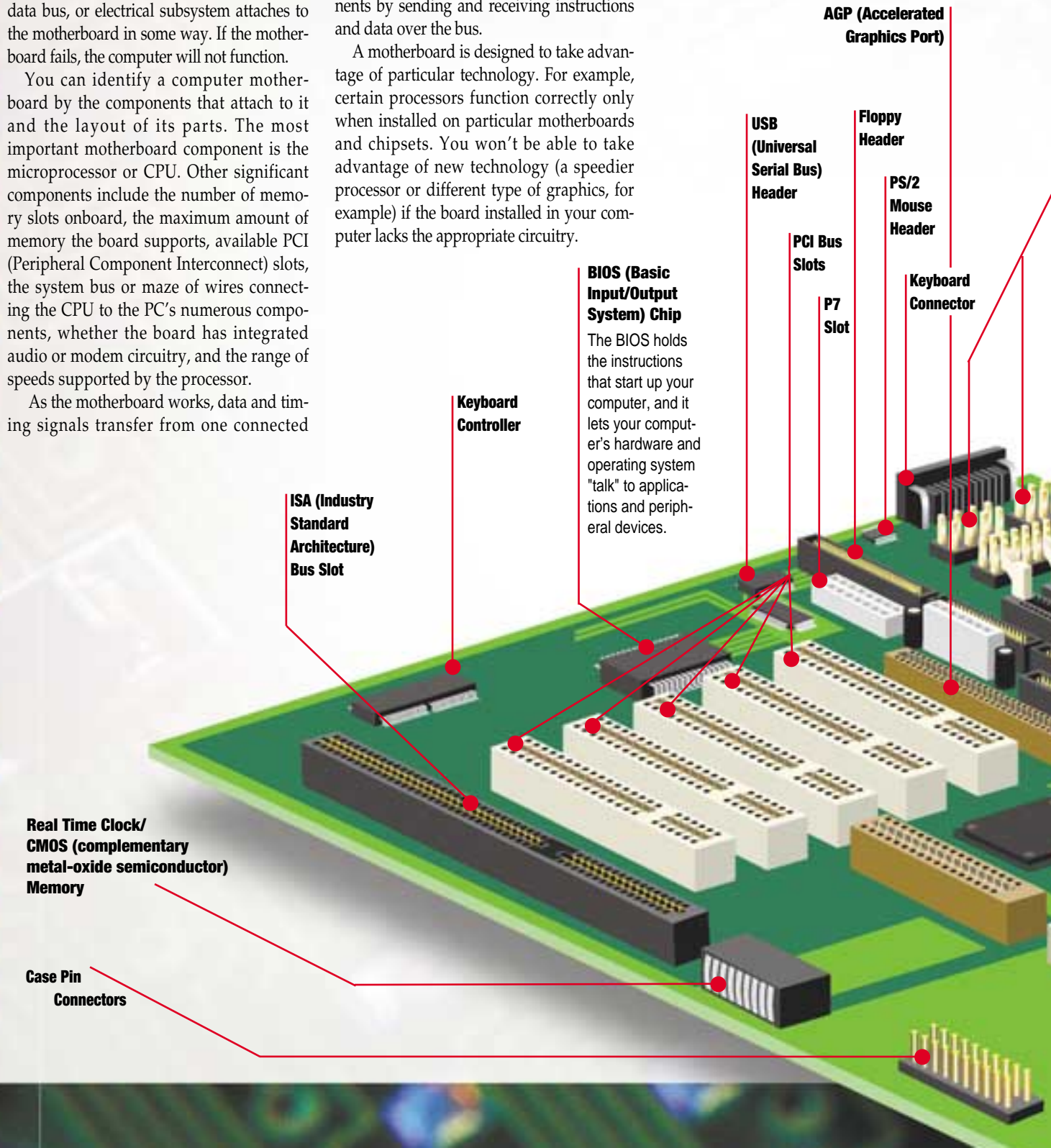
You can identify a computer motherboard by the components that attach to it and the layout of its parts. The most important motherboard component is the microprocessor or CPU. Other significant components include the number of memory slots onboard, the maximum amount of memory the board supports, available PCI (Peripheral Component Interconnect) slots, the system bus or maze of wires connecting the CPU to the PC's numerous components, whether the board has integrated audio or modem circuitry, and the range of speeds supported by the processor.

As the motherboard works, data and timing signals transfer from one connected

component to another by way of interconnected leads etched into the board. These leads are known as the system bus. The power supply (which also connects to the motherboard) distributes power to system components via the bus. The processor also communicates with motherboard components by sending and receiving instructions and data over the bus.

A motherboard is designed to take advantage of particular technology. For example, certain processors function correctly only when installed on particular motherboards and chipsets. You won't be able to take advantage of new technology (a speedier processor or different type of graphics, for example) if the board installed in your computer lacks the appropriate circuitry.

(NOTE: Not all motherboards include all components in this illustration, and not all will look the same as those illustrated here. For more detailed descriptions of most motherboard components, see the accompanying article.)



ISA (Industry Standard Architecture) Bus Slot

Keyboard Controller

BIOS (Basic Input/Output System) Chip

The BIOS holds the instructions that start up your computer, and it lets your computer's hardware and operating system "talk" to applications and peripheral devices.

USB (Universal Serial Bus) Header

Floppy Header

PS/2 Mouse Header

Keyboard Connector

PCI Bus Slots

P7 Slot

AGP (Accelerated Graphics Port)

Real Time Clock/CMOS (complementary metal-oxide semiconductor) Memory

Case Pin Connectors

The illustration to the right shows how a typical RAM chip slides into the appropriate motherboard socket. Most cards and boards insert in a similar way.

