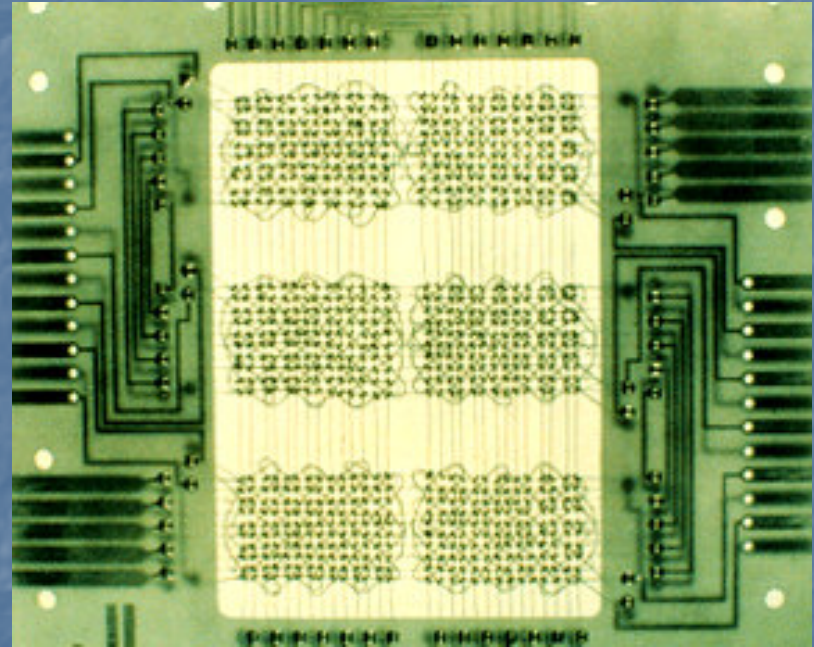


Memory

- Consists of individual cells
- Stores programs and data
is normally either
- RAM - random access memory
- ROM - read-only memory



Core memory from 1953

Memory Capacity


- The smallest unit of storage is the bit, consisting of a 1 or a 0
- The smallest used storage amount is the byte - eight bits allowing for 256 unique combinations of 1 and 0
- The kilobyte (KB) is 1024 bytes
- The megabyte (MB) is 1024 kilobytes, or 1,048,576 bytes

The Byte

- Consists of 8 binary bits

1011 0110

Most significant bit

A white arrow points from the text 'Most significant bit' to the first bit (1) of the binary sequence '1011 0110'. Another white arrow points from the text 'Least significant bit' to the last bit (0) of the same sequence.

Least significant bit

- Can have any of 256 values
- One byte will store one ASCII character
- Each four bits is a nibble

Random Access Memory - RAM

- May be changed by the computer itself
- Cells can be accessed in any sequence
- Volatile
- RAM speed affects system throughput
referred to as
- Main Memory
- Primary Storage

How RAM Is Added

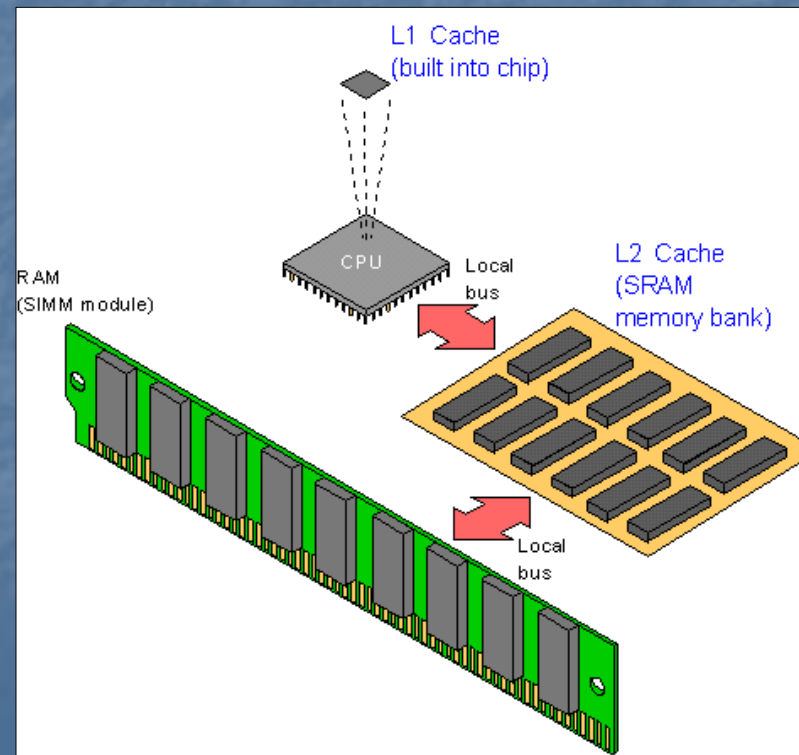
- **Single In-Line Memory Modules (SIMM)**
- **Dual In-Line Memory Modules (DIMM)**
- DIMMs used in Pentium 2 and 3
- SIMMs used in other Pentiums - must be added in pairs
- Finite number of sockets
- 64/128MB suitable for modern multimedia systems

Cache RAM

- Normally much more expensive than ordinary RAM
- Separate to ordinary RAM
- Used inside and outside of the CPU
- Prevents 'wait states' of the CPU
- Operates at very high speeds
- First used in Intel 80486DX CPU

Cache RAM

- Improves processor throughput



Read Only Memory - ROM

- Stores permanent non-changing data, such as BIOS and system configuration

may be

- ROM
- PROM
- EPROM
- CD-ROM

Virtual Memory

- Used to imitate RAM
- Cheaper than RAM
- Slower than RAM
- Only limited by disk space and processor design
- Has been used since early days of computing
- Excessive use is called thrashing