Department of Aeronautics,
Imperial College London

South Kensington Campus, London SW7 2AZ, UK
Telephone +44 (0)20 7594 5048 Fax +44 (0)20 7584 8120

l.foulkes@imperial.ac.uk
www.imperial.ac.uk/aeronautics

Dr Letty Foulkes BA, MS, PhD, CPhys, MinstP
Computer Resources Manager

7 June 2013

Addressee Name
Address Line 1
Address Line 2
Address Line 3
Address Line 4

Dear Sir or Madam,

The name computer comes from "to compute" meaning to calculate. Computers were developed originally to do the maths humans were too slow to do. The technological development that allowed the birth of modern computers is the transistor. Transistor devices could be made to hold a given voltage, a high or a low. Hence, if we connect many transistors we can represent a series made up of 0 (low) and 1 (high). The binary number system can represent any number in 1s and 0s, which means that transistors can represent any number (or a code made up of binary numbers).

To do a calculation two things are needed: a place to hold the numbers, the operation and the result, and a brain to do it. Inside a computer, the first is the memory, and the second is the Central Processor Unit(CPU). The CPU and memory must communicate to exchange information. This communication is done via the bus. Also, the computer needs to receive the information from somewhere and it needs to send the result somewhere. These two operations are called INPUT and OUTPUT. This very simple model still holds today.

The name computer comes from "to compute" meaning to calculate. Computers were developed originally to do the maths humans were too slow to do. The technological development that allowed the birth of modern computers is the transistor. Transistor devices could be made to hold a given voltage, a high or a low. Hence, if we connect many transistors we can represent a series made up of 0 (low) and 1 (high). The binary number system can represent any number in 1s and 0s, which means that transistors can represent any number (or a code made up of binary numbers).

To do a calculation two things are needed: a place to hold the numbers, the operation and the result, and a brain to do it. Inside a computer, the first is the memory, and the second is the Central Processor Unit(CPU). The CPU and memory must communicate to exchange information. This communication is done via the bus. Also, the computer needs to receive the information from somewhere and it needs to send the result somewhere. These two operations are called INPUT and OUTPUT. This very simple model still holds today.

One important element that is missing in this simple picture is timing. Pulses of voltages (high or low) can change state at a certain rate. This rate determines how fast the computer can "think". So computers must have a clock. The clock speed is what computer manufacturers quote when selling computers (in Megahertz). This rate is never achieved in practice by the CPU, and much less by the transfer of information between memory and disk. Hence, the rate should be taken only as a guide but not as the actual speed of the computer.

Yours sincerely,

Letty Foulkes