

COMPUTERS

(The Invention that Affected the Whole World)

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Ever since primitive people became aware of the concept of quantity, people have used some device to count and perform calculations. Primitive people used their fingers, toes, and stones to count. In about 4000 B.C., the abacus, really the first computer, was developed in the Orient. It uses the principle of moving beads on several wires to make calculations. The abacus is very accurate when properly used. It may still be found in some of the older and smaller Asian businesses today.

Computer Timeline

- In 1642, the first mechanical calculator was constructed by a Frenchman named Blaise Pascal. It consisted of eight wheels, or dials, each with the numbers 0 to 9, representing units, tens, hundreds, thousands, etc. It could only add or subtract.
- In 1671, a German mathematician added the capability of multiplication and division. However, this advanced machine could only do arithmetical problems.
- Charles Babbage, a 19th-century English mathematician, produced a machine that could rapidly and accurately calculate long lists of various functions, including logarithms.
- In 1804, a French mechanic, J. M. Jacquard, introduced a punch card system to direct the operations of a weaving loom.
- In the United States, Herman Hollerith introduced the use of punched cards to record personal information, such as age, sex, race, and marital status, for the 1890 U.S. census.
- A mathematician named George Stibitz produced a device in 1939 for the Bell Telephone Laboratories that was capable of doing calculations over telephone wires.
- During World War II, the British built a computer called the Colossus 1, which helped break the German military codes.
- The earliest digital computers used electromechanical on-off switches or relays. The first large computer, the Mark I, assembled at Harvard University by IBM, could multiply two 23-digit numbers in about 5 seconds-a very slow feat compared to today's machines.
- In 1946, the world's first electronic digital computer, the *ENIAC* was produced. It contained more than 19,000 vacuum tubes, weighed almost 30 tons, and took up more than 15,000 sq.ft. of floor space.

- In 1947, the first transistor was produced by the Bell Laboratories used switches to control the flow of electrons. They were much smaller than vacuum tubes, had fewer failures, gave off less heat, and were much cheaper to make.
- In the 1950s, Kilby of Texas Instruments and Noyce of Fairchild discovered that any number of transistors could be etched on a small ¼ inch piece of silicon .030 in. thick. These chips, called *integrated circuits* (ICs), contained entire sections of the computer.
- In 1971, the Intel Corporation produced the microprocessor, a chip that contained the entire *central processing unit* (CPU) for a single computer.

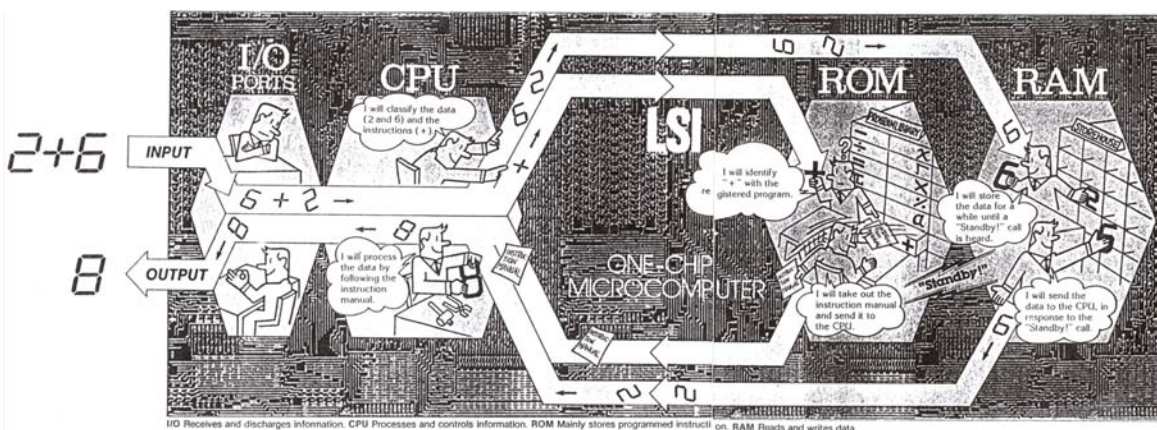
Early Modern Day Computers

At the 1960 Toyota Electronics Show in October the public saw that the microcomputer revolution was really here. They saw how fingernail-size computers would effect products: videos, audios, calculators, watches, and more. Most electric/electronic appliances made today incorporate a minicomputer.

However most people today are unfamiliar with the structure of the tiny giant that is the chip. For this reason, I will attempt to explain the microcomputer in a way that everyone can understand. We will highlight the microcomputer's most essential characteristics and the basics of what makes it work.

Unrivaed Abilities: Computing Speed and Memory

Microcomputers are often referred to as *intelligent devices or electronic brains* because they sometimes actually surpasses your own abilities in a few respects. For instance, it can add single-digit numbers at a rate of 100,000 per second. It can memorize data precisely and it never forgets.



The microcomputer's memory is always limited by its very structure. A person can respond to a command or react to a situation, deciding how to act. Of course, the microcomputer cannot do these things. A person can see, hear, talk, and act, use their body to place them in touch with the outside world. The microcomputer, on the other hand, lacks the means to fully control its own input and output. It has only an interface that must be connected to man-made input and output equipment.

Since the microcomputer is light, inexpensive, and versatile, it has attracted great interest in the electronics field as a valuable device in home and office appliances. Electronic calculators and pocket computers incorporating one-chip microcomputers can calculate and store quite a large amount of data quickly and accurately. High-quality televisions, cassette decks, and air conditioners use them as controllers.

A Microcomputer Operates on the Binary Scale.

The binary scale describes every numerical value and condition with 0 and 1; it's the way a microcomputer interprets our commands. Such commands are given not in ordinary human words but in binary-scale electric signals by which a microcomputer can operate.

What is a "bit"?

"Bit" is an abbreviation of "binary digit" and a unit of information in computer memories. For example: make as many 4-digit numbers, using only 0 and 1, as you can and you'll wind up with 16 combinations (0000, 0001, 0010, 0011, 0100, 0101, 0110, 0111, 1000, 001, 1010, 1011, 1100, 1101, 1110, and 1111).