

## THE HISTORY OF ELECTRONICS

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Theoretical and experimental studies of electricity during the 18th and 19th centuries led to the development of the first electrical machines and the beginning of the widespread use of electricity.

At the time of Thomson's work, the American inventor Thomas A. Edison had observed a bluish glow in some of his early lightbulbs under certain conditions and found that a current would flow from one electrode in the lamp to another if the second one (anode) were made positively charged with respect to the first (cathode).

In 1906 Lee De Forest, an American engineer, developed a type of vacuum tube that was capable of amplifying radio signals.

The vacuum tube permitted the development of radio broadcasting, long-distance telephony, television, and the first electronic digital computers.

The invention of the transistor in 1947 by John Bardeen, Walter H. Brattain, and William B. Shockley of the Bell research staff provided the first of a series of new devices with remarkable potential for expanding the utility of electronic equipment.

During the late 1950s, research on the purification of silicon succeeded in producing material suitable for semiconductor devices, and new devices made of silicon were manufactured from about 1960.

By 1960 vacuum tubes were rapidly being supplanted by transistors, because the latter had become less expensive, did not burn out in service, and were much smaller and more reliable. This fact, together with the need for compact, lightweight electronic missile-guidance systems, led to the invention of the integrated circuit (IC) in by Jean Hoerni and Robert Noyce of Fairchild Semiconductor Corporation in 1959.

By the mid-1980s microprocessor-based equipment proliferated, ranging from automatic teller machines (ATMs) and point-of-sale terminals in retail stores to automated factory assembly systems and office workstations.

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