Transistor computer

A **transistor computer** is a computer which uses discrete transistors instead of vacuum tubes. The "first generation" of electronic computers used vacuum tubes, which generated large amounts of heat, were bulky, and were unreliable. A "second generation" of computers, through the late 1950s and 1960s featured boards filled with individual transistors and magnetic memory cores. These machines remained the mainstream design into the late 1960s, when integrated circuits started appearing and led to the "third generation" machines.

The first transistor computer

The University of Manchester's experimental Transistor Computer was first operational in November 1953 and it is widely believed to be the first transistor computer to come into operation anywhere in the world. There were two versions of the Transistor Computer, the prototype, operational in 1953, and the full-size version, commissioned in April 1955. The 1953 machine had 92 point-contact transistors and 550 diodes, manufactured by STC. It had a 48-bit machine word.[1] The 1955 machine had a total of 200 point-contact transistors and 1300 point diodes,[1] which resulted in a power consumption of 150 watts. There were considerable reliability problems with the early batches of transistors and the average error free run in 1955 was only 1.5 hours. The Computer also used a small number of tubes in its clock generator, so it was not the first *fully* transistorized machine.[2]

The design of a full-size Transistor Computer was subsequently adopted by the Manchester firm of Metropolitan-Vickers, who changed all the circuits to more reliable types of junction transistors.[1] The production version was known as the Metrovick 950 and was built from 1956 to the extent of six[1] or seven machines,[3] which were "used commercially within the company"[3] or "mainly for internal use".[1]

Other early machines

During the mid-1950s a series of similar machines appeared. These included the Bell Laboratories TRADIC, completed in January 1954 also incorporated a single high-power output vacuum-tube amplifier to supply its 1-MHz clock power.[4]

The first *fully* transistorized computer was either the Harwell CADET which first operated in February 1955, although the price paid for this was that it only operated at the slow speed of 58 kHz,[citation needed] or the prototype IBM 604 transistor calculator, described in the next section. The Burroughs Corporation claimed the SM-65 Atlas ICBM / THOR ABLE guidance computer (MOD 1) that it delivered to the US Air Force at the Cape Canaveral missile range in June 1957 was "the world's first operational transistorized computer".[citation needed]

In Japan the ETL Mark III began operation in July 1956; the Canadian DRTE Computer in 1957, while in Austria, the Mailüfterl was completed in May 1958,[5] being the first transistorized computers in Asia and mainland Europe.

The first commercial fully transistorized calculator

In April 1955,[6] IBM announced the IBM 608 transistor calculator which was first shipped in December 1957.[7] IBM and several historians thus consider the IBM 608 the first all solid-state computing machine commercially marketed.[6][8][9][10] The development of the 608 was preceded by the prototyping of an experimental all-transistor version of the 604. This was built and demonstrated in October 1954, but was not commercialized.[7][9][11]

The first commercial fully transistorized large-scale computer

The Philco Transac models S-1000 scientific computer and S-2000 electronic data processing computer, were the first commercially produced large-scale all transistor computers, which were introduced in 1957. The Philco computer name "Transac" stands for Transistor-Automatic-Computer. Both of these Philco computer models, used the surface-barrier transistor in its circuitry designs, which was the world's first high-frequency transistor that was suitable for high-speed computers.[12][13][14] The surface-barrier transistor was developed by Philco in 1953.[15]

In Italy, Olivetti's first commercial fully transistorized computer was the Olivetti Elea 9003, being sold from 1959.[16]

Schools and hobbyists

First generation computers were largely out of reach of schools and hobbyists who wished to build their own, largely because of the cost of the large number of vacuum tubes required (though relay-based computer projects *were* undertaken[17]). The fourth generation (VLSI) was also largely out of reach, too, due to most of the design work being inside the integrated circuit package (though this barrier, too, was later removed[18]). So, second and third generation computer design (transistors and SSI) were perhaps the best suited to being undertaken by schools and hobbyists.[19]

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External links

- The first transistor computer (http://www.computer50.org/kgill/transistor/trans.html) Virtual Museum of Manchester Computing

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