Biography of Tong Shibai



A Pioneer of Electronics

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Chapter 1
A Young Man from Northeast China (1920–1937)



On 14 February 1920, a baby boy was born into a family of educators in Shenyang, Liaoning Province. His parents named him Shibai. The family belonged to the Plain Yellow Banner of the Manchu Eight Banners system and possessed a strong tradition of scholarship and learning. His father was a teacher who maintained strict standards for his children's education, frequently instructing them to “uphold the truth and remain simple and unpretentious.” The child would eventually devote his entire life to cultivating a flourishing field of knowledge in what was then the largely undeveloped discipline of electronics in China.

Winters in Shenyang were long and bitterly cold. Young Tong Shibai received his early education in this major city of northeastern China. The occupation of Northeast China left him with a profound sense of national suffering and loss. In 1937, at the age of seventeen, he left his hometown and embarked on a long journey southward in pursuit of further education.

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Chapter 2
National Southwestern Associated University: Forged in the Flames of War (1937–1946)

After a difficult journey, Tong Shibai arrived in Kunming and gained admission to the Department of Electrical Engineering at National Southwestern Associated University. Established through the wartime collaboration of Peking University, Tsinghua University and Nankai University, the institution brought together some of China's finest professors and most talented students. Amid modest thatched buildings and during intervals between Japanese air raids, Tong received some of the finest engineering education available in China at the time.

In 1946, Tong graduated from National Southwestern Associated University and subsequently joined the faculty of Tsinghua University's Department of Electrical Engineering. A young scholar who had only recently emerged from the turmoil of war now stood at the lectern of one of China's most prestigious universities.

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Chapter 3
Advanced Studies Across the Pacific: Five Years in Illinois (1948–1953)

In 1948, at the age of twenty-eight, Tong Shibai travelled across the Pacific to pursue advanced studies in the Department of Electrical Engineering at the University of Illinois in the United States. He received his master's degree in 1949 and his doctorate in 1951. His doctoral research involved areas associated with classified military technology, and he was familiar with the latest developments in related research at Bell Laboratories.

Following the outbreak of the Korean War, the American authorities imposed strict restrictions on Chinese scientists and technical specialists seeking to return to China. Tong became one of those subjected to official scrutiny. He refused to acquire American citizenship and declined an offer to undertake missile research at an American Air Force base. University officials reprimanded him, immigration authorities threatened him, and Federal Bureau of Investigation agents questioned him on more than one occasion. He was also required to report his whereabouts regularly to the relevant authorities, but he refused to comply with these pressures.

Fortunately, in 1954, Premier Zhou Enlai undertook extensive diplomatic efforts to secure the return of Chinese scientists

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working and studying in the United States, including a group represented by Qian Xuesen. Tong eventually obtained permission to return. In June 1955, he finally set foot on the homeland he had longed for day and night and resumed teaching at Tsinghua University.

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Chapter 4
Returning Home: Building the Discipline of Electronics from the Ground Up (1955–1960s)

Upon returning to China, Tong Shibai faced a discipline that was almost entirely undeveloped. China had no independently produced textbooks on electronic technology, and university classrooms continued to rely on Soviet teaching materials.

His first undertaking was to teach in one of China's earliest lecture programmes on automatic control, jointly organised by Tsinghua University and the Chinese Academy of Sciences. At the same time, he immediately began establishing the Electronics Teaching and Research Group at Tsinghua University in 1956. For the following fifty years, he devoted himself wholeheartedly to cultivating and advancing this academic field.

In the early 1960s, he served as chief editor of China's first four complementary textbooks collectively entitled Fundamentals of Electronic Technology. These works ended the country's dependence on Soviet textbooks in the field and established a new curriculum organised around the principles of rectification, amplification, oscillation and pulse technology.

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Chapter 5
Developing Textbooks in Step with Technological Progress (1970s–2000)

Tong Shibai held firmly to one conviction: “Textbooks are the foundation of a curriculum.” He believed that the establishment and reform of a curriculum's content and structure must ultimately be reflected in its teaching materials.

In the early 1970s, as transistors increasingly replaced vacuum tubes, Tong collaborated with several colleagues to write Transistor Circuits and Transistor Pulse and Digital Circuits. These textbooks “addressed an urgent need facing China's electronics industry during its early development.”

When integrated circuits began to emerge and discrete transistor components were gradually superseded, Tong responded promptly. From the late 1970s to the early 1980s, he served as chief editor of Fundamentals of Analog Electronic Technology and organised the preparation of Fundamentals of Digital Electronic Technology. Together, these works established a new curriculum aligned with international developments.

As integrated circuits advanced from small-scale integration to large-scale and very-large-scale integration, Tong again

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revised and updated the textbooks in 1987 and 2000, refining the curriculum to reflect technological progress.

The first edition of Fundamentals of Analog Electronic Technology, edited by Tong, was published in 1980 by People's Education Press. It was among the earliest domestically published textbooks on analog electronic technology in China. The textbook has since reached its sixth edition under Higher Education Press and has been adopted by nearly 600 universities and colleges across the country. Its third edition was designated a nationally recognised key textbook, and the work received the National Special Prize at the First National Higher Education Teaching Achievement Awards.

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Chapter 6
Doctoral Education and Pioneering Work in Shenzhen: Two Contributions in His Later Years (1981–1983)

In 1981, Tong Shibai led the establishment of China's first doctoral programme in Automatic Control Instruments and Devices at Tsinghua University. Its principal research areas included automatic testing, fault diagnosis and the reliability of electronic systems. Throughout his academic career, he supervised a total of thirty-five doctoral and master's students.

In 1983, at the age of sixty-three, Tong travelled to Shenzhen University to establish an Electronics Teaching and Research Group. Within six months, he had completed the development of laboratories for analog and digital electronic technology. For a professor already in his sixties, this pioneering determination was a reflection of the spirit that had characterised his entire life.

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Chapter 7
Concluding Reflections: One Book, One Scholar, One Discipline

On 24 July 2005, Tong Shibai died in Beijing from cardiopulmonary failure caused by a disorder of the common bile duct. He was eighty-five years old.

His former student, Professor Hu Dongcheng, a former Vice President of Tsinghua University, summarised his mentor's life in a single observation: “Mr. Tong's entire life was connected with books: reading books, teaching from books and writing books. Mr. Tong himself was a substantial volume, a book filled with knowledge and moral integrity.”

From his doctoral research in Illinois to the establishment of the Electronics Teaching and Research Group at Tsinghua University; from ending China's reliance on Soviet textbooks to editing Fundamentals of Analog Electronic Technology, adopted by 600 universities and colleges; and from establishing China's first doctoral programme in Automatic Control Instruments and Devices to undertaking pioneering educational work in Shenzhen in his sixties, Tong Shibai devoted fifty years of unwavering commitment to cultivating a towering tree in the field of electronics.

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In 2020, on the centenary of his birth, the Department of Automation at Tsinghua University compiled Selected Commemorative Writings on the Centenary of Tong Shibai's Birth. The collection brought together accounts of his life, academic achievements, teaching manuscripts, photographs and commemorative essays written by his students, colleagues and family members. Its publication represented a fitting tribute to a pioneering master of electronics.

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