

## The Potential Accomplishments by Coordinated Engineering of the Early Computer by Two Inventors: Konrad Zuse and Howard Aiken

The programmable computational calculating machine was created by diverse people who would have revolutionized our modern world by their cooperation, had they been given the opportunity to cooperate. Today, the computer is a common device in this Information Age, that we currently live in, but such ubiquitous computational technology has not always been the reality. This world is filled with elderly people who knew the world before computers, who might have supposed that computers were a passing “fad.” Little did they know that two pioneering engineers who lived in isolation from each other, were creating a machine that would change the world. Their names were Konrad Zuse and Howard Aiken.

Konrad Zuse lived in Germany during WW2. He was an engineer, who desired a device to complete repetitive mathematical calculations [1]. And he was the first to actualize a programable calculating machine (computer) [1]. However, the road was long and arduous for the engineer. He was plagued with a lack of resources: money, parts, and time [1]. Zuse invented the Z1-Z4 calculating machines, sometimes out of recycled materials which would hinder the accuracy of the calculations [1]. He tried to persuade the German government to give him time away from the eastern front to develop his calculating machine, sometimes failing [1].

Howard Aiken lived in the US during WW2. He was an engineer, who desired a device to complete repetitive mathematical calculations [2]. He had more financial room to create the machine, (the Mark I) due to a deal made with IBM [2], and the military incorporated his machines (Mark II and Mark IV) in their systems, reassigning him to operate his own creation [2 and 3].

Zuse could have been a driving force of developing the computational technology, mentoring Aiken, and utilizing Aiken’s resources. Zuse did not have the advantage of having fellow computational engineers, like Aiken had [3]. He did have access to Babbage’s writings, but there is no clear indication that Zuse had any peers who could discuss design details with him [1]. Aiken could have filled the role of fellow engineer, if Zuse had been on the Allies side of the war, or Zuse could have been a mentor to Aiken, since Zuse made his Z3—a fully electromagnetic calculating machine—in 1941 [1], while Aiken made his electro-mechanical Mark I in 1943. Aiken could have helped Zuse in developing the Z2, which used “second-hand relays” [1], because Aiken’s business contacts with IBM could have provided high-quality relays. It is very clear that a relationship of Zuse with Aiken would have been mutually beneficial.

If Zuse had been with Aiken, Aiken would have been able to perfect the Mark I, using electromagnetic components instead of electrical (as was the ENIAC [3]). More design could have led down the electromagnetic route, and an entirely different technology could have developed instead of electrically driven calculators, a world of nano-switches instead of a world of micro-transistors. Even though we could be living in a completely different world if Zuse and

Aiken had met and become lab partners, it is also entirely possible that our world would not be any different as it is today, but Zuse and Aiken would have been forever memorialized as two of the greatest technological revolutionaries that helped drive the world into the modern age.

*it is certainly correct to say that when the switch on Mark I was thrown, the  
Computer Age began.*

*– John Lee*

## Bibliography

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