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# Gene Amdahl – a Swedish-Norwegian computer pioneer

Computers are now a common daily tool, but they also have their history

By CARL-JOHAN IVARSSON

Translation by Elisabeth Thorsell and Christopher Olsson.

In the 3<sup>rd</sup> edition of the Swedish encyclopedia *Bra Böcker's Lexikon*, volume 5 (Coe-Dick) from 1984, we find the word “*Dator*” (computer). It says *dator* or *datamaskin* is “a machine that without human interference can perform large computations of a great number of arithmetic and logical operations.”

On about six pages, a close description of all can be found. The pictures show integrated circuits, disc memories, and a computer hall. But to give a picture of a newer era, a young woman sitting by the Swedish computer ABC800 is shown. We can easily see that much has happened during these 29 years.

The historical part of the article starts with Charles Babbage, the man who built a mechanical “stone age” computer in 1822, and some

other early pioneers are mentioned as well as some known early computers in Sweden with names like BARK, BESK, and SMIL. Apple is mentioned, but not Microsoft. We do not find the business superstars of our time, people like Steve Jobs and Bill Gates. But one name is mentioned when it states: “during the 1970s several manufacturers started to build totally IBM-compatible central units that can directly run programs and operation systems from IBM. The best-known manufacturer of these (...) was Amdahl, founded by Gene Amdahl, formerly a head of construction at IBM.”

Who is this Gene Amdahl, and why is he considered worthy of being mentioned in such an article? And what was his connection to Värmland?

## South Dakota

Gene Myron Amdahl was born 1922 Nov. 16 close to Flandreau, Moody Co., South Dakota. The name sounds Norwegian, and three of his grandparents came from Norway.

His paternal grandfather Ole Olsen Amdahl was born in 1855 in Ytre Amdal, Nedstrand parish, near Haugegesund on the Norwegian *Vestlandet*. Ole immigrated with parents and siblings as a tiny boy. In 1879 he came to Moody County, and obtained land via the Homestead Act, where settlers could get land for free.

There he married Sofia Eriksdotter (AKA Sophia Ericson), born in 1857 in Ölserud in Kila parish, (Vrml.). Sofia came to Moody Co. in 1881 and had six siblings that all came to America, most of them to Moody Co. in the eastern part of South Dakota, then still a territory (it became a state in 1889).

Flandreau is one of four little towns in Moody Co., which is an agricultural county. In the 1920 U.S. Census some 9,742 individuals lived in the county; in 2010 there lived only 6,486 individuals. The population decrease is primarily due to the diminishing need for agricultural laborers.

The strange thing is that more families from Kila parish ended up in this special area on the prairie. They grew to be so many that there was a post office named Kila, South Dakota, for a few years around 1900. There was also a cemetery called “Kila Swedish Cemetery.” So one can say that Gene Amdahl had his origins in both places called Kila.

Gene Amdahl's father was named



The office computer ABC 800, built in 1981 by the Swedish company Luxor, which also had a home computer, ABC 80, which became very popular and was the most in use then. It was the start of the Swedish Computer Genealogy Society (DIS) in 1980.

Anton Edwin Amdahl. His mother was Ingeborg Brendsel who had her roots in Byneset, close to Trondheim. Anton Amdahl farmed corn, barley, oats, and alfalfa and raised cattle. In an interview Gene talks about life on the farm, about when the first tractors came, and how his father made paint by mixing skim milk, concrete, and red ochre.

## Education

Gene Amdahl went to an ordinary rural school in Moody County with about 15-20 pupils, and passed through eight grades there. The last two years in high school he studied at the Augustana Academy boarding school in Canton, South Dakota. In spite of meagre conditions, education was important in his family, especially for his mother who was a trained teacher. He was accepted in the fall of 1941 at the South Dakota State College (later University) in Brookings. He applied to this school mostly because of the wishes of his parents, and he did not want to become a farmer but to escape the need to depend on the changeable weather in South Dakota.

The United States became in December 1941 involved in World War II, and everyone had to take part in the war effort. After a year as a teacher of physics, Gene Amdahl served for two years in the Navy as a teacher of electronics. His three brothers all enlisted in the Army and sailed overseas, while Gene Amdahl only served on a ship in dry dock. In April 1945, just three weeks before the end of the war, Gene Amdahl lost his brother Orin, who was leading his army group across the Rhine when he was shot by a sniper.

## End of war and marriage

In the fall of 1946 Gene could return to South Dakota State, where he received his BSc degree in technical physics in 1948. By then he had also married Marian Delaine Quissell, whose origins were from the same area in Moody Co.

Marian also had strong roots in Kila, where her grandmother Hulda

Maria Andersdotter was born in 1874 in Grunnerud, and in 1894 had immigrated to the area of Flandreau, where her maternal uncles had come during the 1880s. These uncles were married to the sisters of Gene Amdahl's paternal grandmother's mother, so there was another connection to Kila.

In the 1920s a new generation of immigrants came to Moody County when Hulda's brother's son John Takman tried his luck in America. He returned to Sweden after his time in the U.S. and became a communist, a social doctor, and finally a member of parliament for the then *Vänsterpartiet Kommunisterna* (Swedish Communist Party). He kept up the contacts with his cousin Marian, and invited the Amdahls to visit him at Stora Backa in Kila in 1984.

## Research student

Gene Amdahl was accepted as a research student in theoretical physics at the University of Wisconsin in Madison, WI, in 1948. There he was given the task, with two other students, of calculating the nuclear power of the stable isotope of "the tritium nucleus."

After calculating for thirty days with the help of a mechanical calculator, they decided it was impossible to make as exact a calculation as they wished. Gene Amdahl then decided to build a computer, later known as WISC (Wisconsin Integrally Synchronized Computer). For Gene Amdahl the construction of the computer became the start of his later career. He wrote his doctoral thesis (*The Logical Design of an Intermediate Speed Digital Computer*) about the computer and it was approved in February 1952. Gene Amdahl told that at that time there was not a single book about computers in the university library of University of Wisconsin, so his thesis was a pioneering effort. WISC is now at the Computer History Museum in Mountain View, CA.

Thanks to his work with WISC, he was recruited by IBM in Poughkeepsie, New York, at that time the

giant in the computer industry. Computers were then what are now called mainframes, and it is in this part of the industry that Gene Amdahl made his mark. IBM worked at this time with Model 701, and Amdahl worked on Model 704, the first machine with a programming language.

## Mainframes

Mainframes have a much longer history than personal computers (PCs), and are still an important part of the infrastructure in, for instance, banks, authorities, and processing industries. Even if the development of the PC had gone faster, mainframes are regarded as a more secure and reliable alternative when huge amounts of data are to be handled.

Gene Amdahl resigned from IBM in 1955, and then worked for two smaller electronics companies in California, but returned to IBM in New York State in September 1960 to lead the development of the System 360, one of IBM's most successful mainframe systems. Gene Amdahl wanted to go back to California, and was given this choice in February 1965, when he was elected an IBM Fellow, with the opportunity to work for five years on anything in the many departments of this enormous company that he wanted. He chose an attachment to IBM's new Advanced Computing Systems Laboratory in Menlo Park, CA. In the fall of 1969 he left IBM for the second time as he was an advocate for IBM building larger and more powerful computers, combined with a frustration of the bureaucratic company culture of IBM.

## Success

Gene Amdahl decided to start his own company. IBM is called "Big Blue" as it has a blue company logotype. Thus this new company, Amdahl Corporation, founded in the fall of 1970, became red! The business idea was to build mainframes that would be compatible with the IBM machines but more powerful. The trend was to make the electronics smaller, but Gene Amdahl

thought differently. Why not produce chips with more space for the electronics and thus be able to increase the power greatly, as well as increase their reliability?

The antitrust laws also made it possible for Gene Amdahl to use IBM's software. Amdahl Corporation invested more than 40 million dollars before they could deliver their first System 470 V/6 computer. It was three times as powerful as IBM's similar model. Amdahl became a serious competitor of "Big Blue" and succeeded in capturing as much as 22% of the market, when several big customers such as AT&T, General Motors, and NASA bought Amdahl mainframes.

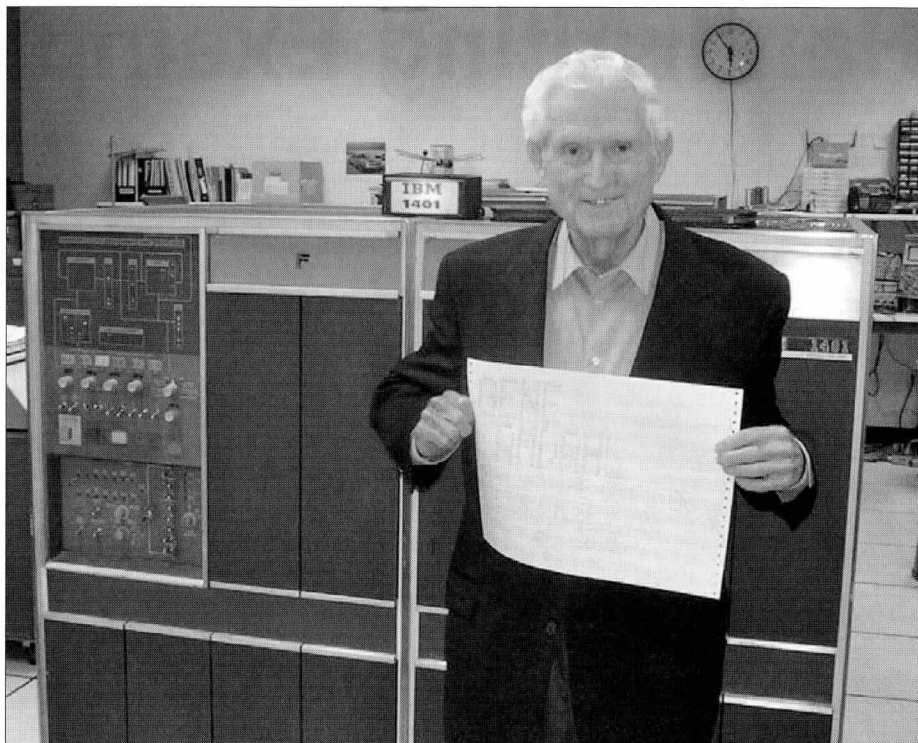
Gene Amdahl has always been both an inventor and an entrepreneur, and in September 1979 he found the time ripe to conclude his work for the company that bore his name; in August 1980 he totally severed all ties with Amdahl Corporation. This company continues, now wholly owned by Japanese Fujitsu, which they were already working with.

The next step was to challenge the IBM monopoly in the field of the most powerful mainframes. The new company was named Trilogy Systems, and based on the good reputation of Amdahl many were interested in investing in the company. Gene Amdahl himself hoped to be able to sell for a billion dollars after two years on the market.

Trilogy Systems business was built on Gene Amdahl's technical knowledge, and the goal was to be able to use 20 silicon wafers instead of 2000 electronic chips. This would increase the performances considerably.

### ... is followed by adversity

The Trilogy Systems adventure in the end turned into a big disaster. The goal was to present a finished product in 1984, but various delays and technical problems resulted in the end of development. The 70 million dollars that was left of the in-



Gene Amdahl in 2010. (Picture from <http://ibm-1401.info/>)

vestors' money was used to buy a competing company that had a product to sell, Elxsi.

Gene Amdahl has continued working with mainframes. In 1994 he founded a new company, Commercial Data Servers, that was liquidated a couple of years later. Today he is mostly known for Amdahl's Law which he presented in 1967, a formula that shows the possibilities of improving computers by using parallel processors. He has been a visiting professor at Stanford University, and has received honorary doctorates from both his alma maters, South Dakota State University and the University of Wisconsin, as well as from Luther College in Decorah, IA. He has also been honored by other associations such as IEEE Computer Society, the Association for Computing Machinery, the British Computer Society, and the National Academy of Engineering. Gene and Marianne Amdahl live in Palo Alto, CA.

To rank his celebrity one can find that he receives about 125,000 hits on Google. Steve Jobs who was not worth mentioning in the encyclopedia in 1984 now gets 830 million hits...

### Sources:

- Slater, Robert: *Portraits in Silicon*, MIT Press 1987.
- Oral history – interview from the University of Minnesota (1986 and 1989).
- Oral history – interview from the Computer History Museum (2000). *Link on p. 30!*
- Letter from Gene Amdahl to the author 1997.
- English Wikipedia – articles on Gene Amdahl, the Amdahl Corporation, and IBM.
- Gene Amdahl's thesis from 1952 can be read on the internet: *see link on page 30!*

### Note:

*Sophia Erickson*, paternal grandmother to Gene Amdahl, was the sister of Johan August Erickson, father of Eric Elmer Erickson, see SAG 2013:1, p. 12.

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