Leaving the Beaten Path

// Milestones of contemporary electronic history that change(d) society

October 29, 1923: First official radio program broadcast in Germany, Vox Haus, Berlin

CHAPTER 1: The Vacuum Tube

"Bottle of Magic", Western Electric – "Electronics at Work", 1942, Westinghouse Electric Corp. – TV Set Commercial, Radio Corporation of America (RCA) – "ENIAC", original 1946 announcement film of ENIAC remastered

CHAPTER 2: Invention of the Transistor, Part I

On June 30, 1948 Bell Labs held a press conference to announce the invention of the bipolar transistor – In 1956 Wiliam B. Shockley, Walter H. Brattain and John Bardeen shared the Nobel Prize in Physics for their achievement – Interview with William B. Shockley – Commercial: The regency TR-1 from 1954 was the first commercially manufactured transistor radio.

CHAPTER 3: Launch of Sputnik – The Dawn of the Space Age

On October 4, 1957, the Soviet Union successfully launched Sputnik. The world's first artificial satellite was about the size of a beach ball, weighed only 83,8 kg and took about 98 minutes to orbit the Earth on its elliptical path. This event marked the start of the space age and the USA-USSR space race. It spurred the United States to create the Advanced Research Projects Agency (ARPA) in February 1958 to regain a technological lead.

CHAPTER 4: Invention of the Transistor, Part II

In 1957 a group of eight highly talented PhD graduates left Shockley Semiconductor Laboratory and formed Fairchild Semiconductor: Julius Blank, Victor Grinich, Jean Hoerni, Eugene Kleiner, Jay Last, Gordon Moore, Robert Noyce, Sheldon Roberts. Fairchild was started with the goal to develop more reliable silicon transistors (instead of germanium). The "Fairchild Eigth" also pionieered the planar process, developed by Jean Hoerni. In 1960, Noyce worked, independently from Jack Kilby, on the integrated circuit and invented the planar integrated circuit. Later Fairchild Semiconductor became an incubator of Silicon Valley, and was directly or indirectly involved in the creation of dozens of corporate spin-offs, such as AMD and Intel. These spin-offs, and its company founders, came to be known as "Fairchildren".

CHAPTER 5: First Integrated Circuit

Interviews with Jack Kilby and Harvey Cragon (both Texas Instruments) on the invention story of the IC. Jack Kilby invented the first integrated circuit while working at Texas Instruments in 1958. He was awarded the Nobel Prize in physics on December 10, 2000.

CHAPTER 6: Conquest of the Moon

Historical John F. Kennedy moon speech, Rice University, September 12, 1962 – Apollo 11 launch, July 16, 1969, 13:32:00 UTC, Kennedy Space Center – Moon landing, July 20, 1969, 20:17 UTC

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CHAPTER 7: The Microprocessor

On July 18, 1968 Robert Noyce and Gordon Moore founded Intel. In 1971 Intel created the first commercially available microprocessor, the Intel 4004, and one of the first microcomputers in 1972 – Gordon Moore on Moore's Law

CHAPTER 8: Software History

Computer programming in the punched card era – The UNIX Operating System – The lost 1984 video: young Steve Jobs introduces the Macintosh - Steve Jobs on programming – Software freedom activist and GNU project founder Richard Stallmann on the culture of open source

CHAPTER 9: Discovering Electronic Music

1983 documentary film by Bernard Wilets on the basics of analog synthesis, digital sampling and sequencing. With the improvement of synthetic musical instruments at the beginning of the 1980s the era of electronic dance music evolved. Music styles like Synthipop, Euro Disco, House and later Techno not only shaped the sound of the 80s but also of the following decades.

CHAPTER 10: From ARPANET to WWW

Co-inventor of the TCP/IP protocols Robert E. Kahn on ARPANET networking and communication principals – Leonard Kleinrock, father of the theory of packet networks, on the initial motivation for the ARPANET and the beauty of package switching – The three letters on the very first ARPANET connection in early October 1969 – Finding Tim Berners Lee in the world wide web – Edward Snowden on the importance of a free and open internet

CHAPTER 11: Artificial Intelligence

Interview with AI Sophia: Does AI have a soul? – AI Agent playing packman

CHAPTER 12: How does Innovation Evolve?

Harvey Cragon, computer engineer, known for his work on the first digital computer with Integrated Circuits: "Some of the engineers and scientists must have slack time to think about things. They can't be planned and scheduled down to the last second of the year".

Jack Kilby, Nobel Laureate: "You have chosen the successful projects from that time. There were hell of a lot of that were not."

William B. Shockley, Nobel Laureate: "it has been my experience that everything, all of the more difficult inventions I've made … required many failures to accomplish … I think the big contribution that can be made … is to persuade them (the youth) that they shouldn't worry about making mistakes."

About the film: The citations used for "Leaving the beaten path" is based on comprehensive internet research work. The intention of the author was to take an artistic approach to turn spotlights on important milestones in the field of electronic, that changed or will change society. The work, however, is not intended to be a complete historical documentation of electronic history. More milestones and pioneers can be found at the electronica 2016 milestone museum. The selection of the film material is influenced, and limited, by publicly available material, time and the editors personal opinion. **Special thanks to all individuals supporting the culture of publicly sharing. This project would not have been possible without.**

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