



John Vincent Atanasoff  
The father of the computer  
(October 4, 1903 - June 15, 1995)

# Introduction

- Clifford E. Berry
- Iowa State College (during the 1940s)
- ABC (Atanasoff-Berry Computer) - the first electronic digital computer.

# Bulgarian Origin

- Born in Hamilton, New York on 4 of October 1903
- His father Ivan Atanasov was born in a country village named Boiajik, in Bulgaria. In 1889 he immigrated in United States
- John Vincent Atanasoff – always proud Bulgarian

# The Dietzgen slide rule - year 1912

- John Vincent Atanasoff - a very good student and normal kid
- His father bought the The Dietzgen slide rule
- 9 years old learned the base-two number system

# Education

- Mulberry high school (1919 - 1921)  
Old Chicora, Florida.  
(wanted to study theoretic physics )
- BS electrical engineering (1921 - 1925 )  
University of Florida in Gainesville
- MS in mathematics (1925 - 1926)  
Iowa State College in Ames
- Ph.D. in theoretical physics (1926 – 1930)  
University of Wisconsin

# The Need for Computer

- PhD. thesis "The Dielectric Constant of Helium"
- The Monroe calculator - one of the best calculators at that time.
- Analog Calculators - Very slow and not always accurate

# The ABC (Atanasoff-Berry Computer)



Source: <http://www.scl.ameslab.gov/Projects/ABC/Progress.html>

# Physical Specifications

- Weigh - seven hundred pounds (320 kg)
- Contained approximately 1 mile (1.6 km) of wire
- About the size of a Desk
- The AC power line frequency of 60 Hz - the primary clock rate
- Logic functions fully electronic, implemented with vacuum tubes

# ABC computer - the first electronic digital computing device

- Specific purpose, to solve systems of simultaneous up to 29 linear equations
- Accept two linear equations at a time
- Did not implemented the stored program architecture (Von Neumann architecture)

# Important ideas used in computers now-days

- Using binary digits (1's and 0's) to represent all the numbers in a given data
- Perform all the calculations using electronics instead of mechanical switches and wheels
- The memory and the computations were separate
- Regenerative capacitor memory that is still used now-days in DRAM

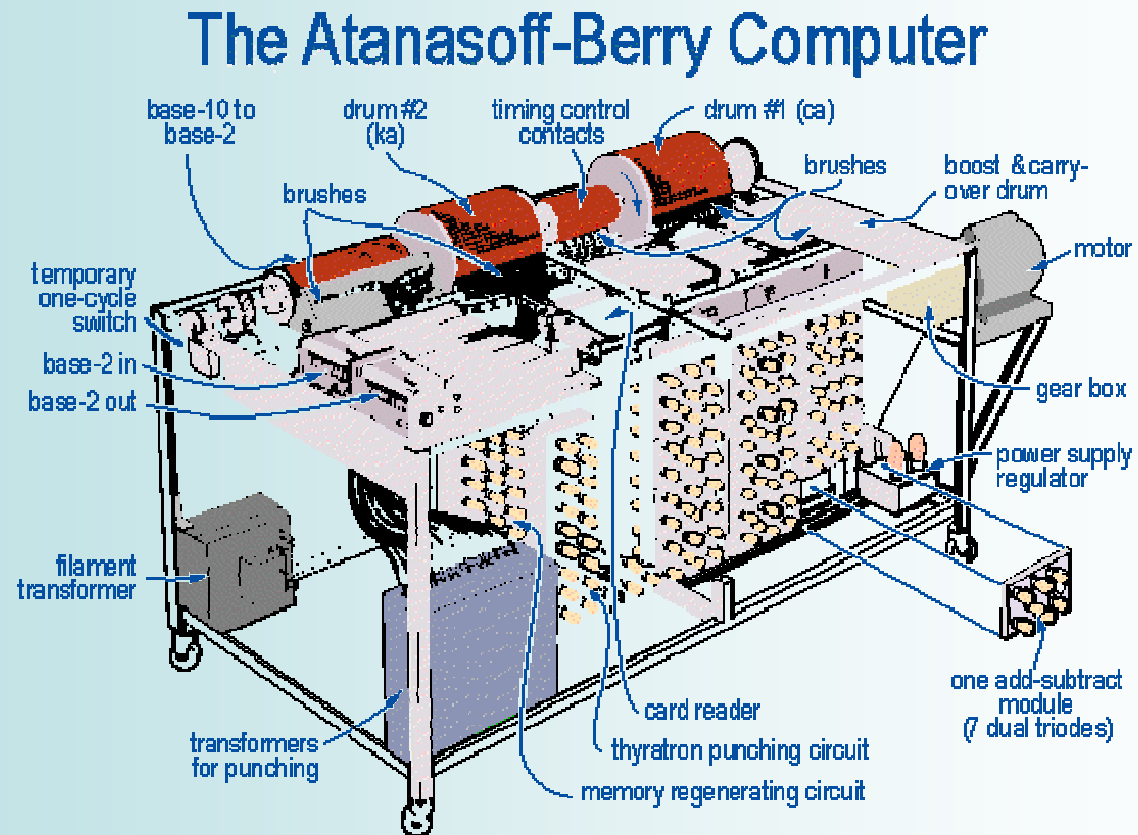
# Memory

- 1600 capacitors that rotated on a common shaft once per second.
- The capacitors on each drum were organized into 32 "bands" of 50
  - (30 active bands and 2 spares in case a capacitor failed)
- 30 additions/subtractions per second
- Data represented as 50-bit binary fixed point numbers
- Memory could store 60 numbers at a time (3000 bits)

# Operation

- Not able to perform fully automatic
- Operator was needed to control the different functions
- Punch Cards were used for input and intermediate output, a Display for output
- largest problem that could be solved without the use of the intermediate output and input was two simultaneous equations

# The ABC (Atanasoff-Berry Computer) Diagram



Source: <http://www.scl.ameslab.gov/Projects/ABC/Progress.html>

# The Patent

- ENIAC (Electronic Numerical Integrator and Computer) vs. ABC (Atanasoff-Berry Computer)
- December 1940 Atanasoff told Mauchly about his new digital device and invited him to see it.
- Mauchly and Eckert applied for a patent on a "General-Purpose Electronic Computer" in 1947
- In 1973 a U.S. District Court ruled that the ENIAC principals were taken from the ABC and stated the Atanasoff-Berry Computer as the first computer in the world

# John Vincent Atanasoff after ABC

- 1942 called on duty in the Naval Ordnance Laboratory in Washington, as a theoretical physicist
- (1942 - 1966) the Dynamics of the Sea Vessels.
- Holds patents to over 30 different devices:
  - a device for capturing and recording seismic sound waves,
  - a post office sorting system,
  - automated systems for package preparation and others.
- After a long sickness Atanasoff died on June 15 1995, in his home in Maryland.

# The ABC Reconstruction

- 1997 a project to develop a fully functional replica of the ABC, with a \$350,000 budget, completed in the Ames Laboratory, located in the Iowa State Collage.
- On display on the first floor of the lobby of the Durham Center for Computation at Iowa State University
- Pictures:  
<http://www.scl.ameslab.gov/Projects/ABC/Progress.html>