

# A Brief History of Computers

In The U.S.

Vol 1 The beginning to (about) 2016

Part 1 up to 1959

Part 2 1960 to 2016

According to Bill Olmo

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## NOT Included

- Super Computers or Parallel Computers
  - Except to mention Watson appeared on Jeopardy in 2011
- Analog Computers
- UNIX – Originally UNICS (UNiplexed Information and Computing Service)
- Smart phones
- Hand held calculators
- Dedicated word processors
- Computers outside the US
  - With a couple of exceptions

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## Counting

- Pebbles in a hole
- Sand Tables ~~III~~ II

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## Computing

- 450 BC – Abacus
- 1620 – Slide Rule invented by John Napier
- 1642 – Adding Machine Invented by Blaise Pascal, wheels and gears
- 1671 – Desk Calculator Invented by Leibnitz, wasn't always accurate

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## Computing

1822 – Difference Engine Proposed by Charles Babbage (1792 – 1871), he was

- Grandfather of the modern computer
- Inventor of the cow catcher
- Originator of the penny post
- Worked on a system to beat the horses

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## Computing

1837 – Analytical Engine Invented by Charles Babbage who wanted: “A machine which will solve any problem which can be stated mathematically.”

- Steam Powered
- He invented a system to machine precision parts
- It consisted of four parts:
  - STORE – 1000 50-digit numbers
  - MILL – perform arithmetic
  - TFR – transfer info back and forth
  - READ – punched paper tape
- It was never completed

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## Computing



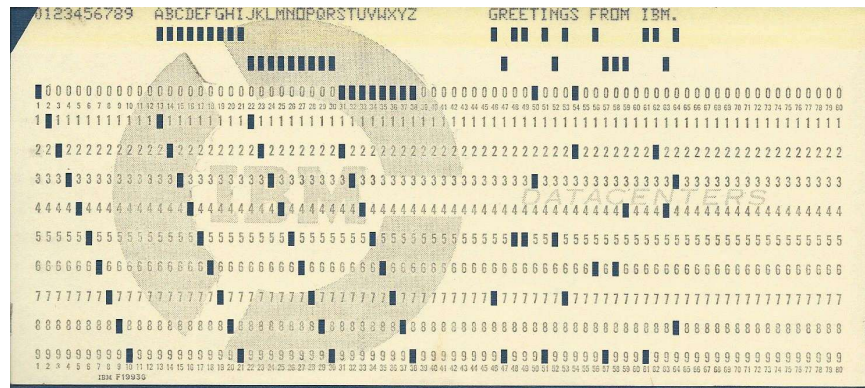
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## Computing

- 1887 – Punched Cards Invented by Dr. Herman Hollerith
  - 1880 census was just completed and 1890 census was projected to be completed in 1906
  - He invented card punch, sorter and tabulator
- 1896 – Hollerith organized the Tabulating Machine Company
- 1911 – Hollerith adds time clocks and renames his company to Calculating Tabulating and Recording (CTR)
- 1914 – CTR
  - Hollerith retires
  - Thomas J Watson Sr. takes over
  - 1,346 employees
  - \$4,000,000 in revenue
- 1924 – International Business Machines
  - CTR opens an office in Canada and renames itself IBM

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## 80 Column Card



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## Computers

### 1941 Trackball Pointing Device

- British Royal Navy Scientific Service
- Patented in 1947
- Declared a military secret

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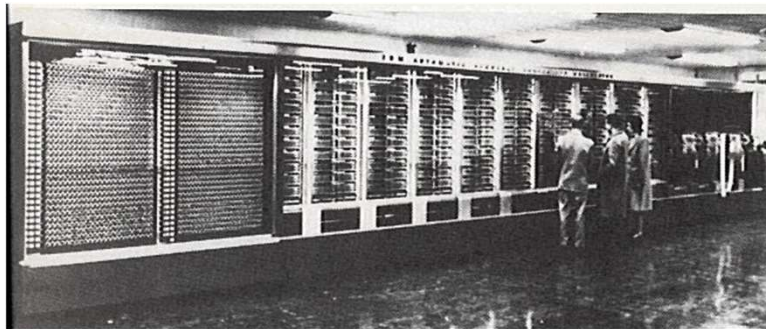
## Computers

1944 – Mark I invented by Dr. Howard Aiken at Harvard University, started in 1937

- 3036 digit memory
- 1656 counters
- 1380 relays
- Paper tape loop for instructions
- Could add two numbers in 0.3 seconds
- First computer “bug”
- Dr. Bowen at Harvard calls this “The first machine actually built which exploits the principles of the Analytical Engine as they were conceived by Babbage a hundred years before.”

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## Computers



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## Computers

- 1947 – Electronic Numerical Integrator And Calculator (ENIAC) invented by Drs. Eckert (engineer) and Mauchly (mathematician) at the University of Pennsylvania
  - First vacuum tube machine with 18,000 of them it was feared all the lights in west Philadelphia would dim when they turned it on
  - 3984 digit storage
  - 30 by 50 feet weighing 30 tons
  - Add two numbers in 200 microseconds (the ratio of one microsecond to one second is the same as the ratio of one second to twelve days)
  - Sold to the Aberdeen Proving Grounds to do trajectory calculations
- 1948 – Bell Labs invents the transistor.

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## Computers

- 1950 – Electronic Discrete Variable Automatic Calculator (EDVAC) Invented by Eckert and Mauchly
  - Dr. John Von Neumann joins the team from the Manhattan Project
  - Von Neumann develops the concept of storing the program in the machine
  - 5900 vacuum tubes and 12,000 diodes
  - Aberdeen Proving Grounds

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## Computers



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## Computers

- 1951 – Universal Automatic Calculator (UNIVAC) invented by Eckert and Mauchly
  - Introduced magnetic tape
  - Wanted a company to market for them at \$25,000 each
    - IBM said no
    - Remington Rand said yes
  - First customer was Bureau of Census

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## November 4, 1952

- The day that changed everything
- Well the night actually
- I'll give you three clues

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## November 4, 1952



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## November 4, 1952

8.30 P.M.

IT'S AWFULLY EARLY, BUT I'LL GO OUT ON A LIMB.

UNIVAC PREDICTS--with 3,998,745 votes in--

	STEVENSON	EISENHOWER
STATES	5	43
ELECTORAL	93	438
POPULAR	18,986,436	32,915,049

THE CHANCES ARE NOW 100 to 1 IN FAVOR OF THE ELECTION OF EISENHOWER.

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## November 4, 1952

Preparing for CBS to use a UNIVAC in its 1952 election coverage, UNIVAC designer J. Presper ("Pres") Eckert and operator Harold Sweeney show the machine to American news icon Walter Cronkite.



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## November 4, 1952

- At 5:30 PM (PST) 3.9 million votes counted
- CBS gets election prediction from UNIVAC
- CBS can not believe it!
- Shortly after 9 PM (PST) CBS broadcasts predicted results.
- Predicted and actual electoral college votes
  - Eisenhower 438 & 442
  - Stevenson 93 & 89
- Final count was 61.1 million votes

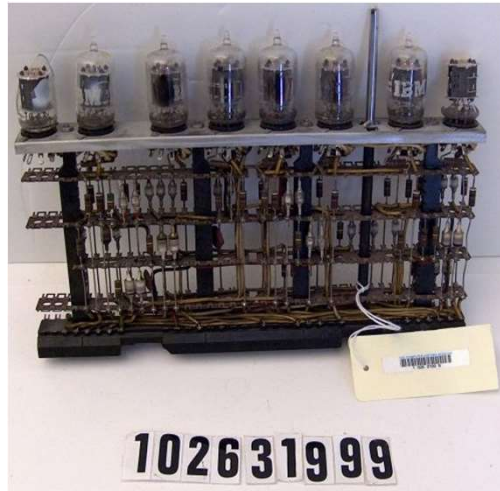
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## Computers

- 1952 – IBM Defense Calculator
  - T J Watson Jr asks president Truman what IBM can do to help with the Korean War
  - Defense Calculator was built for the Air Force for bombing and navigational systems
  - Renamed 701 and 18 were sold to the public in the next two years
  - Packaged to fit through a standard door
  - Multiple pluggable units (vacuum tube and circuitry)
- 1953 – JOHNNIAC named after Von Neumann by Rand Corp.

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## Computers



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## Computers

- 1956 – IBM 305 Random Access Memory Automatic Computer (RAMAC)
  - In 1951 IBM sends a small group of engineers to California to take advantage of engineering talent from West Coast Universities
    - San Jose Laboratory started in a garage,
    - They invent Disk Storage
  - Assembled with covers, the disk drive was 60 inches long, 68 inches high and 29 inches deep and weighed one ton.
  - 50,000 sectors, each of which held 100 alphanumeric characters, for a capacity of 5 million characters (5 Meg).
  - Rental was \$3200 per month
  - There is one on display at the Computer History Museum in Mountain View and it is demonstrated every Wednesday afternoon

(Note: In 1938 HP developed their first oscilloscope in Palo Alto.)

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## Computers



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## Computers

- 1957 – FORTRAN (FORMula TRANslation) Invented by John Backus, started in 1954
  - Previously you had to know the computer's internal instructions to program
  - What is one plus two times three?
  - Do you know why?
- 1958 – Integrated Circuits introduced by Fairchild Semiconductor
- 1959 – IBM 7090 and 1401 transistorized computers
  - Over 12,000 1401s were sold
  - Printed circuit boards

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## 1401 card reader, processor, printer and tape drive



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## Computers

- 1959 – Two dissimilar computers (UCLA and SRI in Menlo Park) were able to communicate with each other by Advanced Research Projects Agency Network (ARPANET)

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# END OF PART 1

## COMMENTS?

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To be continued next month.  
Thanks for listening.