
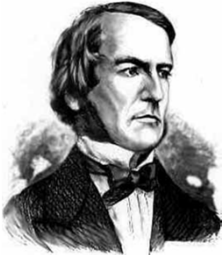


	<p>TECH 3233 Lecture 1 Computer History University of Memphis Assistant Professor Daniel Kohn</p>
	<p>1</p>

	<p>1822 – Charles Babbage</p>
	<ul style="list-style-type: none">■ Difference Engine■ All Mechanical “Computer”■ Capable of performing complex calculations not exceeded until the 20th Century.■ Analytical Engine
	<p>2</p>

	<p>1854 – George Boole</p>
	<ul style="list-style-type: none">■ Boolean Algebra■ AND, OR, NOT, TRUE/FALSE■ All modern day computers work on his principles
	<p>3</p>

1904 – First Vacuum Tube



- Invented by John Fleming
- Shown is the first diode vacuum tube

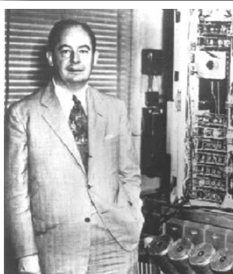
4

1930 – First Analog Computer

- Made with tube op-amps
- Calculations were done feeding in analog signals and voltages
- Outputs were either on o-scopes, volt meters or chart recorders
- Hard wired – hours to set up one calculation

5

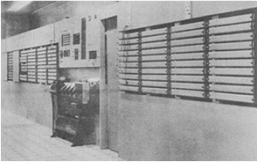
1943 – Von Neumann



- Credited with the idea of storing programs in what we call RAM

6

1944 – Electromechanical Computer



- Based on Relays
- Slow and Unreliable

7

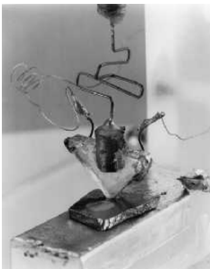
1946 – Electronic Numerical Integrator and Computer (ENIAC)



- First All Electronic Computer
- 30,000 Vacuum Tubes
- 47 Panels
- Made to calculate trajectories for artillery shells.

8


1947 - Transistors

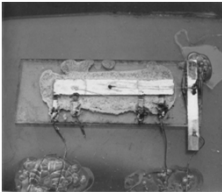


- Bell Labs
- Almost every electronic device built today has transistors inside!

9

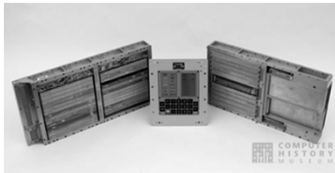
	<h2>1956 - Fortran</h2>
	<ul style="list-style-type: none">■ Fortran – FORmula TRANslation■ First High Level Computer Programming Language <p style="text-align: right;">10</p>

	<h2>1961 – PDP-8</h2>
	<ul style="list-style-type: none">■ First Successful Minicomputer■ Made by Digital Equipment Corporation■ 4K of 18bit words■ \$120,000 <p style="text-align: right;">11</p>

	<h2>1964 – Integrated Circuit</h2>
	<ul style="list-style-type: none">■ First circuit to be made out of one piece of germanium. <p style="text-align: right;">12</p>

1968 – Block I

- Apollo Spacecraft computer
- 20 op codes
- 30K ROM
- 2K RAM
- 2.048 MHz
- Weight – 20 lbs



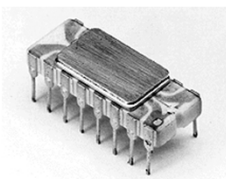
13

1969 – ARPANET

- Forerunner of the Internet
- First network was established between
 - UCLA
 - Stanford
 - University of California at Santa Barbara
 - University of Utah

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1971 – Intel 4004




- First microprocessor
- 4 bit CPU
- 4K Max external Memory
- 45 Op Codes
- 108 KHz
 - 60,000 instructions per second
- 2300 transistors


15

	1971 – Intel 8008
	<ul style="list-style-type: none">■ First 8 bit microprocessor■ 16K max external memory■ 48 op codes■ 108 KHz■ 3500 Transistors
	16

	1973 – Intel 8080
	<ul style="list-style-type: none">■ 8 bit microprocessor■ 16 bit address bus (max 64K External memory)■ 6000 Transistors
	17

	1975 - Altair
	<ul style="list-style-type: none">■ Produced by MIT■ First Personal Computer■ 8080 Processor■ \$400 in kit form
	18


	<h2>1977 – Intel 8085</h2>
	<ul style="list-style-type: none">■ 5MHz clock speeds■ 6500 transistors■ Improvements over 8080<ul style="list-style-type: none">– Single Voltage source– Serial communications– Needed fewer support IC's
	19

	<h2>1977 – APPLE II</h2>
	<ul style="list-style-type: none">■ First computer with color graphics■ Expandable with card slots
	20

	<h2>1978 – Intel 8086</h2>
	<ul style="list-style-type: none">■ 10MHz■ 16 bit data bus■ 24 bit address bus■ 10MHz■ 29,000 Transistors
	21

	1979 – Intel 8088
	<ul style="list-style-type: none">■ Similar to 8086 but uses multiplexing to create a 16 bit data bus on 8 actual lines. <p style="text-align: right;">22</p>

	1980 – Motorola 6800
	<ul style="list-style-type: none">■ Intel is not the only one producing microprocessors, Motorola is also producing them. <p style="text-align: right;">23</p>

	1981 – IBM XT
	<ul style="list-style-type: none">■ 8088 CPU■ First widely used PC■ DOS operating system■ Standardized ports, expansion slots..... <p style="text-align: right;">24</p>

	<h3>1982 – Intel 80286</h3>
	<ul style="list-style-type: none"> ■ 16MHz processor ■ 134,000 Transistors ■ 16 bit data bus ■ 24 address bus
	<small>25</small>

	<h3>1984 – IBM AT</h3>
	<ul style="list-style-type: none"> ■ Based on 80286 Processor
	<small>26</small>

	<h3>1985 – Intel 80386</h3>
	<ul style="list-style-type: none"> ■ 32 bit data bus ■ 32 bit address bus ■ 50 MHz ■ 275,000 Transistors
	<small>27</small>

1989 – Intel 80486

- Improved version of '286
- 100 MHz
- 1.2 Million Transistors

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~1991 – Internet Goes Public

- The Clinton administration decides to allow private citizens on the internet backbone. Up until this point it was used mostly by researchers involved in government projects.

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Moore's Law

Year of Introduction	Processor Model	Approximate Transistors
1971	Intel 4004	2,300
1972	Intel 8008	6,000
1978	Intel 8086	290,000
1985	Intel 286	2.75 million
1989	Intel 386	27.5 million
1989	Intel 486	120 million
1993	Pentium	3.1 million
1997	Pentium II	7.5 million
1999	Pentium III	9.5 million
2000	Pentium 4	29 million
2001	Intel Itanium 2	200 million
2002	Intel Itanium 3	800 million

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Bibliography

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- http://lifeboat.com/images/moores.law.technological_evolution.jpg

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