

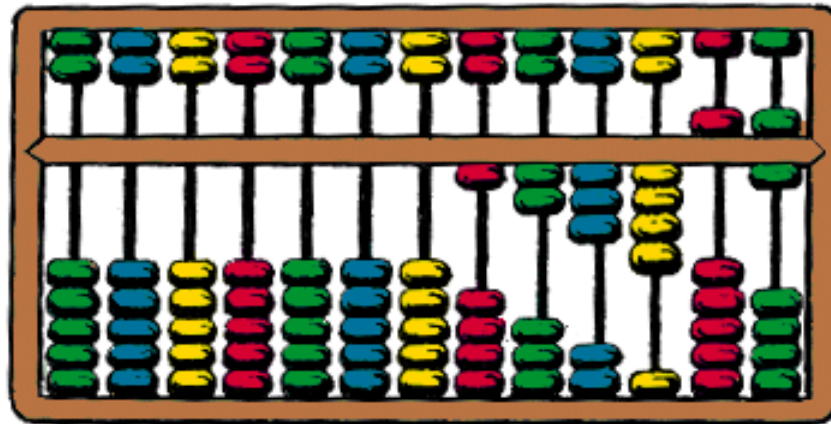
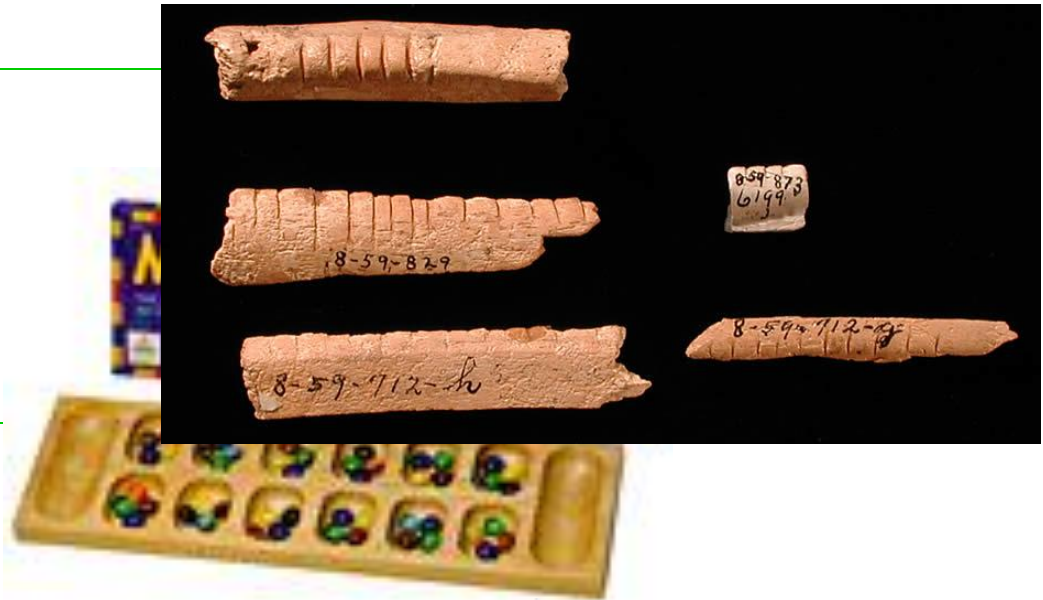
Chapter 2

The History and Development of Computers



Ancient Computing Devices

- ✓ Fingers
- ✓ Tally bones
- ✓ Sticks
- ✓ Stones - "cal"
- ✓ Abacus -
5000
years ago



John Napier



- 1617—Scotland
- Napier's Bones
 - Square sticks with numbers written on
 - Placed in frame
 - Read across to get answer



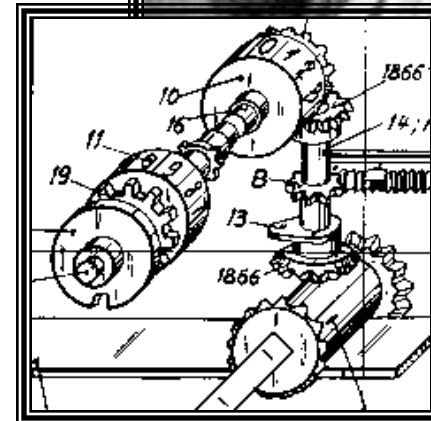
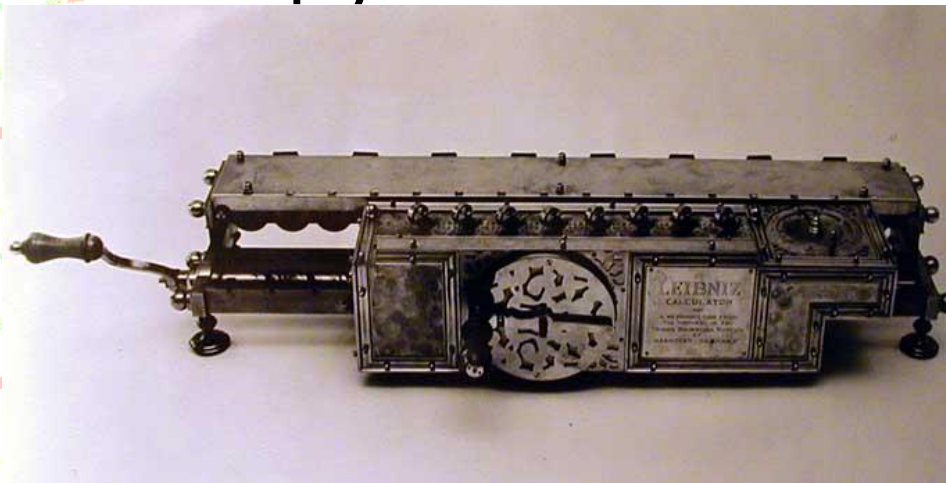
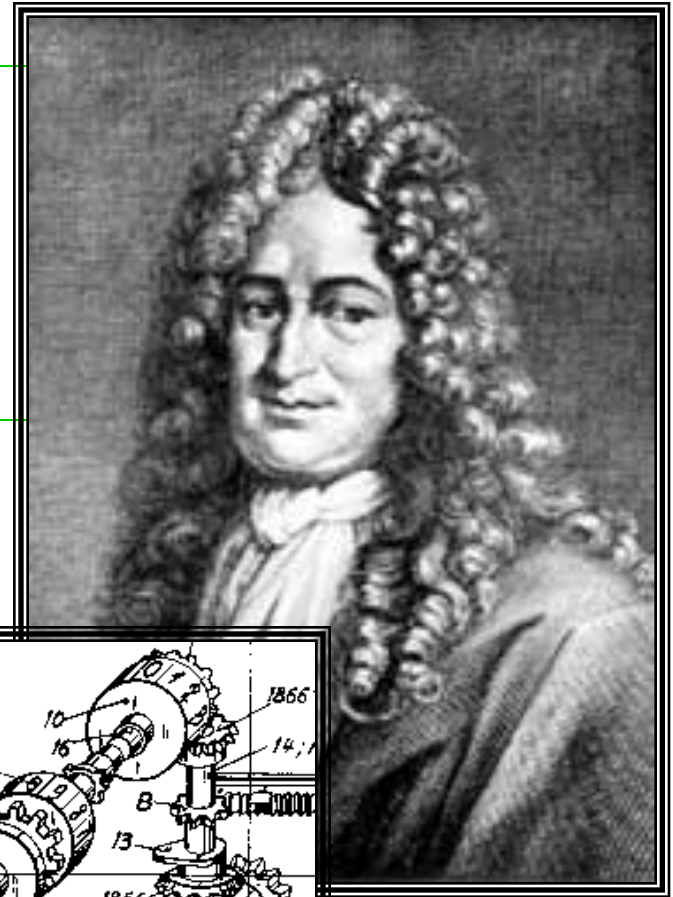
Blaise Pascal

- France
- 1623-1662
- 1642-Numerical Wheel Calculator (Pascaline)
- Could only add



Gottfried Wilhelm von Leibniz

- Germany
- 1646-1716
- Leibniz wheel-1673
- Could add and multiply



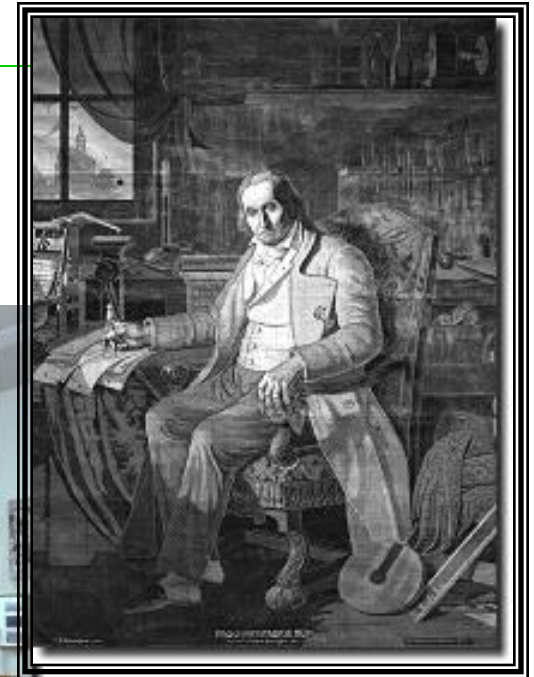
Benjamin Franklin

- Collected electrical charge--1752
- Discovered that lightning is electrical charge
- Conducted many experiments with electricity
- Invented lightning rod



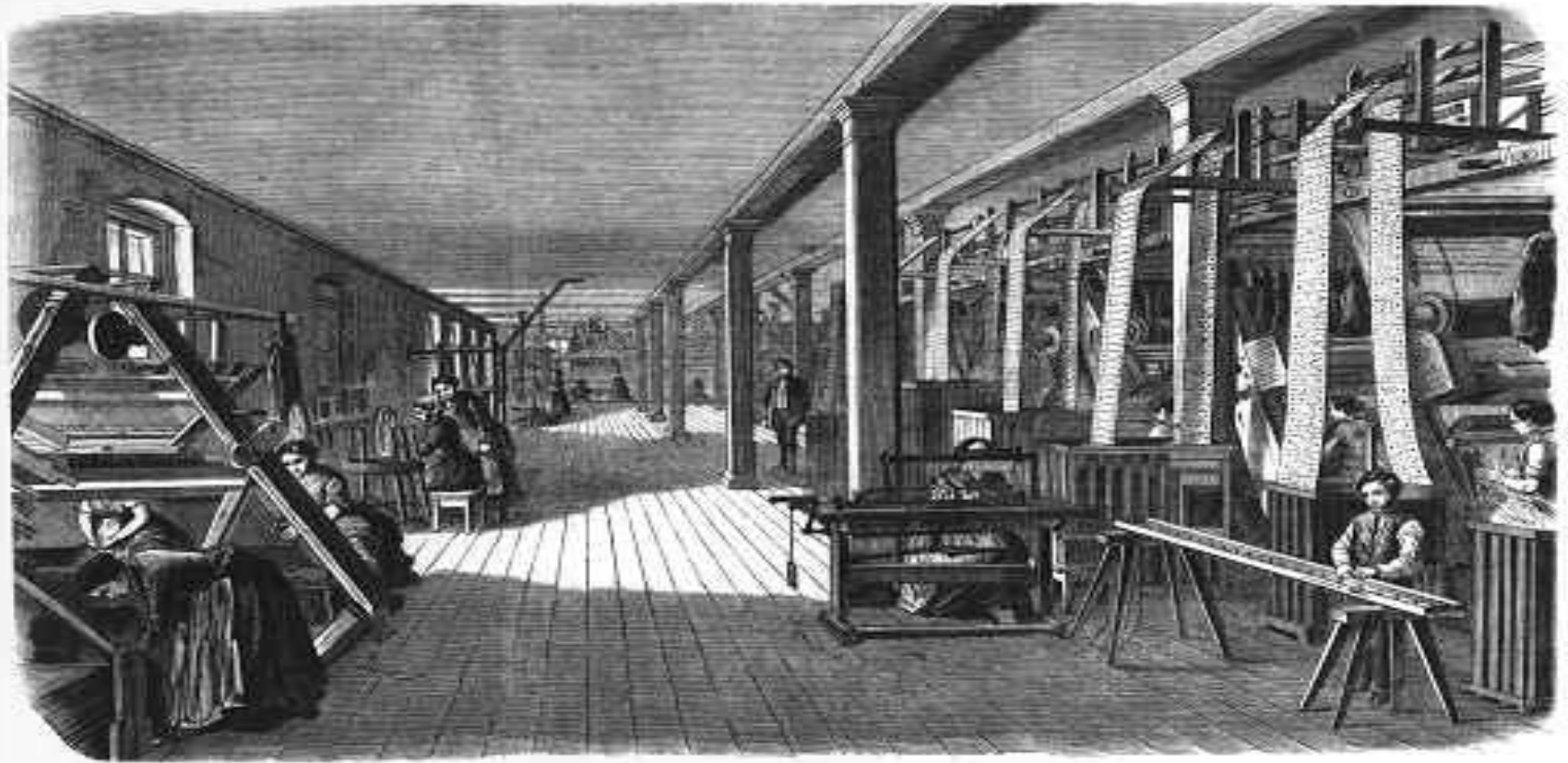
Joseph-Marie Jacquard

- France
- 1752-1834
- Loom - improved method for weaving cloth-1804
- Ancestor of the punched card
- First computer program





The Jacquard Loom



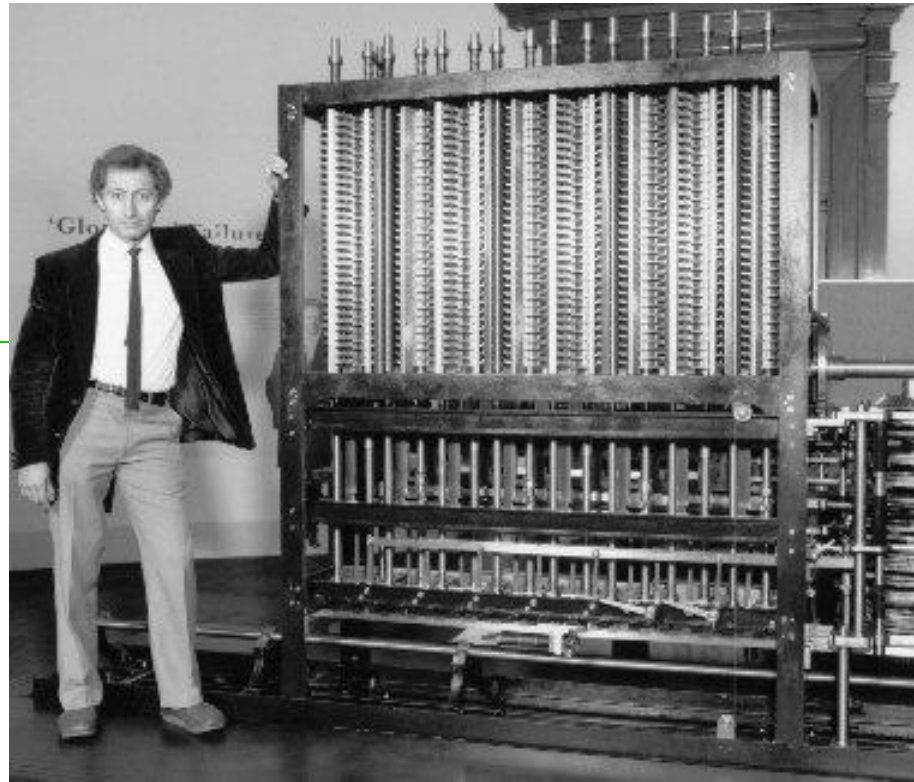
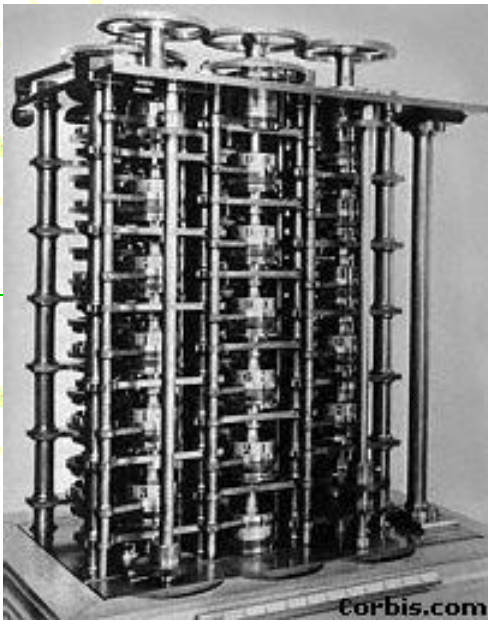
<http://www.youtube.com/watch?v=f1Zzj9ZBYmQ>

Charles Babbage



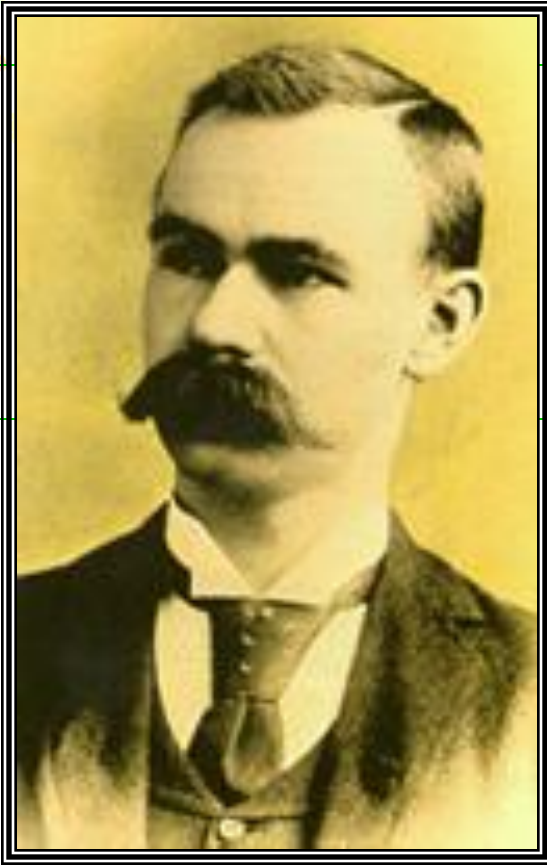
- England
- 1792-1871
- Difference Engine-1821
- 4 processes – input, processing, storage, output
- Later developed the Analytical Engine

The Difference Engine



<http://www.youtube.com/watch?v=0anIyVGeWOI>

Herman Hollerith



1860-1929

- United States census - 1880
- 7-8 years to complete
- Tabulating Machine- 1884
- Used punched cards
- Finished in about 10 weeks
- Founded International Business Machine Company (IBM)

Automatic Card Reader



Early Punched Cards



FRIDAY, APRIL 19, 1895.

HOLLERITH'S ELECTRIC TABULATING MACHINE.

A number of prominent railroad accounting officers have recently examined, with much interest, an invention for doing the great mass of the figuring in a freight auditor's office by machinery, at a considerable saving in time and expense, and with perfect accuracy; and as the devices are exceedingly ingenious, and of interest to all accounting officers, whether they are likely to use them or not, we shall try in this article to describe them, though it will not be possible, in the space available, to do so in full detail. The simplest form of Hollerith's machine is that which was used in the compilation of the last

a record of the sex, age, race, conjugal condition, birth-place, occupation, etc., of each person. For counting the simple elements these cards were passed through the electric tabulating machinery in which the punched holes controlled the circuits through electro-magnets of suitable counters. To illustrate the method of connecting a machine for counting combinations of various

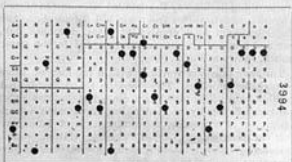


Fig. 4.—Sample of Punched Card, About One-fourth Size.

United States census, for assorting and adding units only. The principles of the device for doing this will be understood from the following brief description after which the application of the apparatus to the more complicated work of making up freight statistics, will be more readily understood.

In the last census a card was punched for each one of the sixty million units or persons enumerated. The cards described the characteristics of the respective persons by the location of the holes. In this way there was

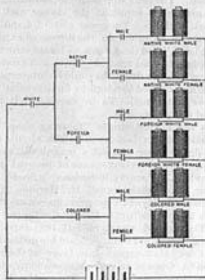
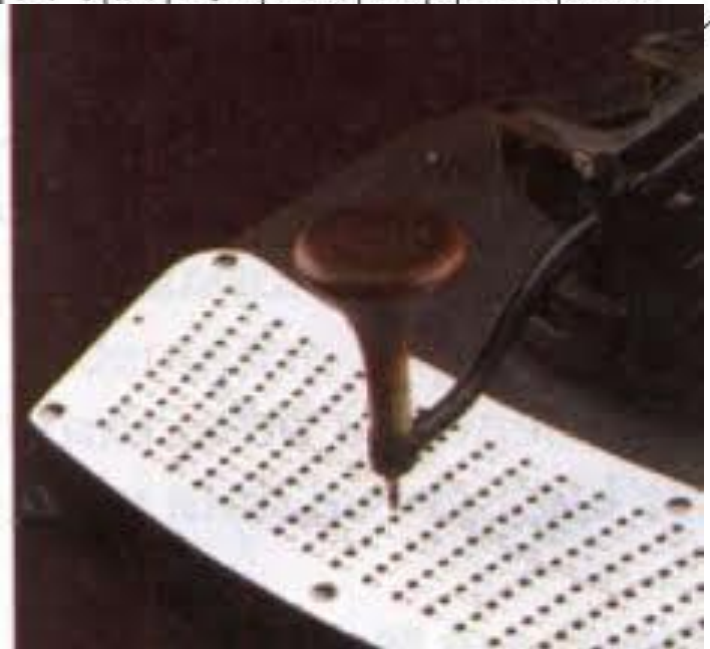


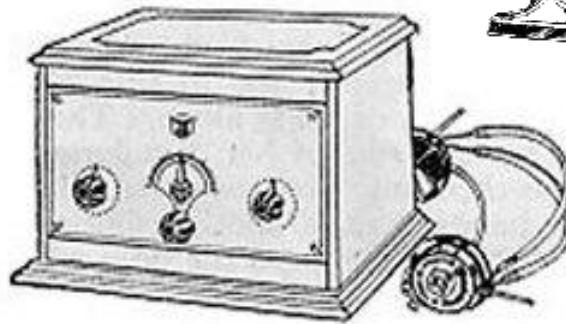
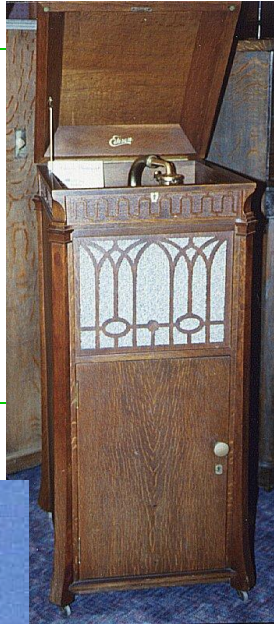
Fig. 5.—Electric Connections for Combination Counting.

facts reference is had to Fig. 5. In the present instance it is arranged to count combinations of race, sex and general nativity. Relays are operated directly by means of the punched cards. These relays close secondary circuits, as shown in the diagram. For example, in the present instance the current comes from the battery to

1	2	3	4	CM	UM	Sp	Ch	Co	In	20	50	80	Dv	Un	3	4	3	4	A	E	L	e	g	
5	6	7	8	CL	UL	O	Ht	Qd	Mo	25	55	85	Wt	DT	1	2	1	2	B	F	M	b	b	
1	2	3	4	CS	US	Hs	B	H	O	30	60	0	2	Mr	0	15	0	15	C	G	N	a	i	
5	6	7	8	No	Hd	MC	V	F	3	35	65	1	3	Sg	5	10	5	10	D	X	O	4	X	
1	2	3	4	Fh	Ff	Fz	7	1	10	40	70	90	4	0	1	3	0	2	35	I	P	e	1	
5	6	7	8	Hh	Hf	Hs	8	2	15	45	75	95	100	Un	2	4	1	3	4	X	Un	f	m	
1	2	3	4	X	Un	Pt	9	3	1	a	X	R	L	E	A	6	0	US	Ir	So	US	Ir	So	
5	6	7	8	On	En	Mt	10	4	X	6	Y	S	M	F	B	10	1	Gr	En	Wa	Gr	En	Wa	
1	2	3	4	M	R	OK	11	5	1	e	S	T	X	O	C	15	2	Sw	FC	BC	Sw	FC	BC	
5	6	7	8	7	4	1	12	6	m	f	NG	U	O	N	D	Un	3	Nv	Bo	Ht	Nv	Bo	Ht	
1	2	3	4	8	5	2	Co	0	=	g	a	V	P	I	AL	3a	4	Dx	Fr	It	Dx	Fr	It	
5	6	7	8																					



The Age of Electricity

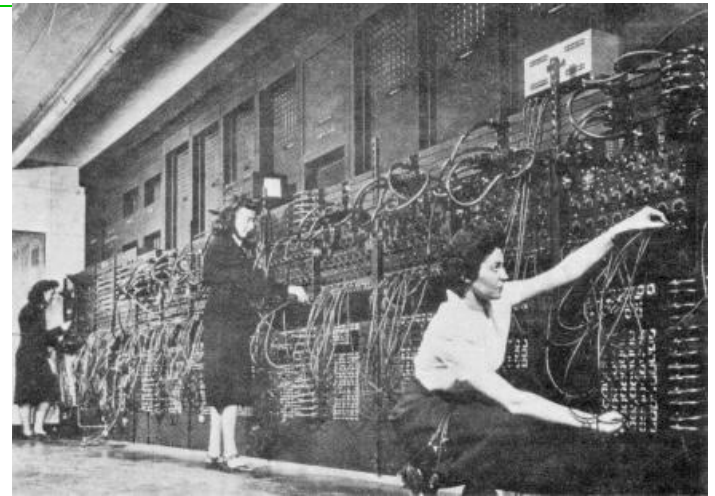


R-2—A two tube receiver utilizing a coupled circuit tuner, regenerative detection and one stage A. F. Amplification. Mahogany cabinet. \$55



First Generation Electronic Computers - 1941-1956

- Mechanical parts or vacuum tubes
- Magnetic drum storage
- Instructions specific for each task
- Machine language
- Performed basic arithmetic operations



Konrad Zuse

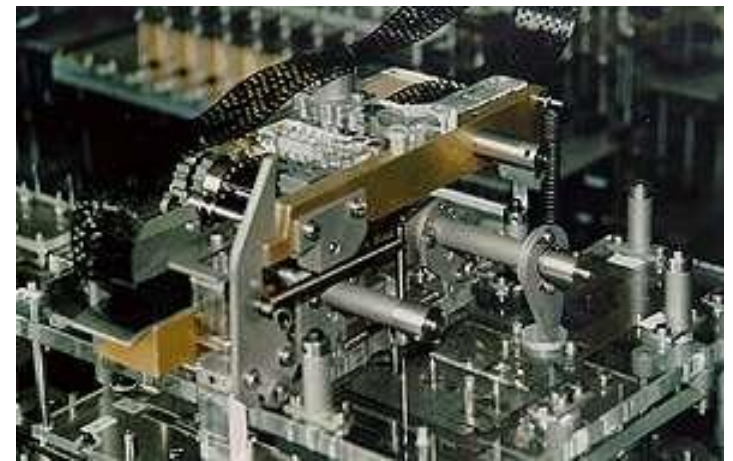
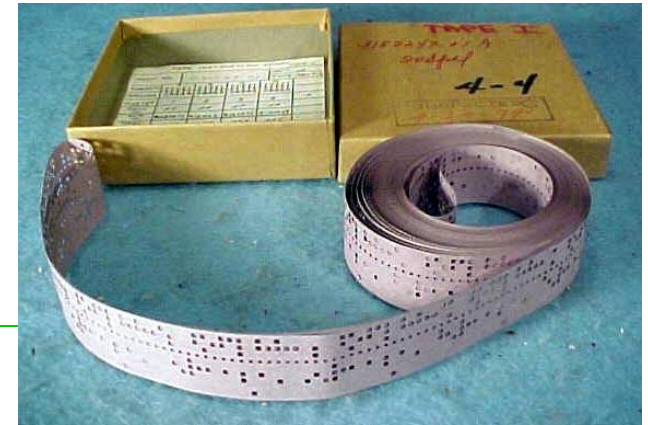


- Germany
- Built the Z1 in 1936
- ■ Operating speed of 1 Hz (today's computers are billions of times faster)

Zuse's Early Computers

Punched Tape

The Z1 -1936



The Enigma

- Germany-WWII
- Code translation
- Could code, decode, and create new codes thousands of times faster than a human

<http://www.youtube.com/watch?v=Hb44bGY2KdU&feature=related>



Mark I

- Howard Aiken –
Harvard University –
1943
- Electromechanical
relay switches
- Very noisy
- Used by the Navy
for defense



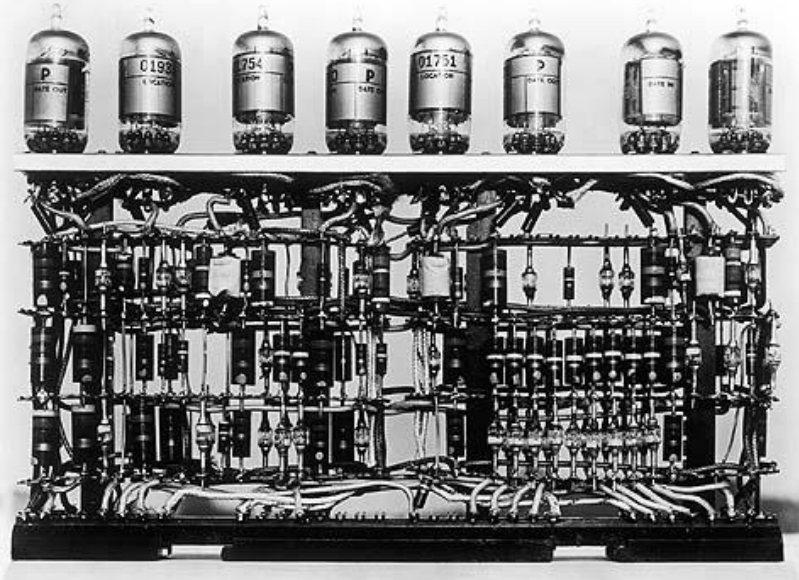
Vacuum Tubes

Advantages

- Quieter
- Faster

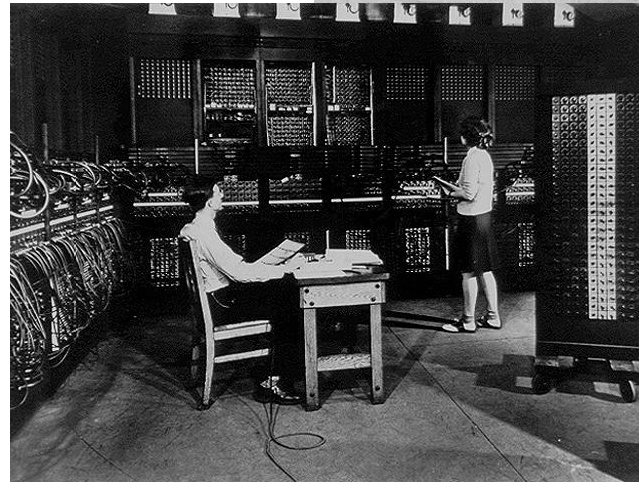
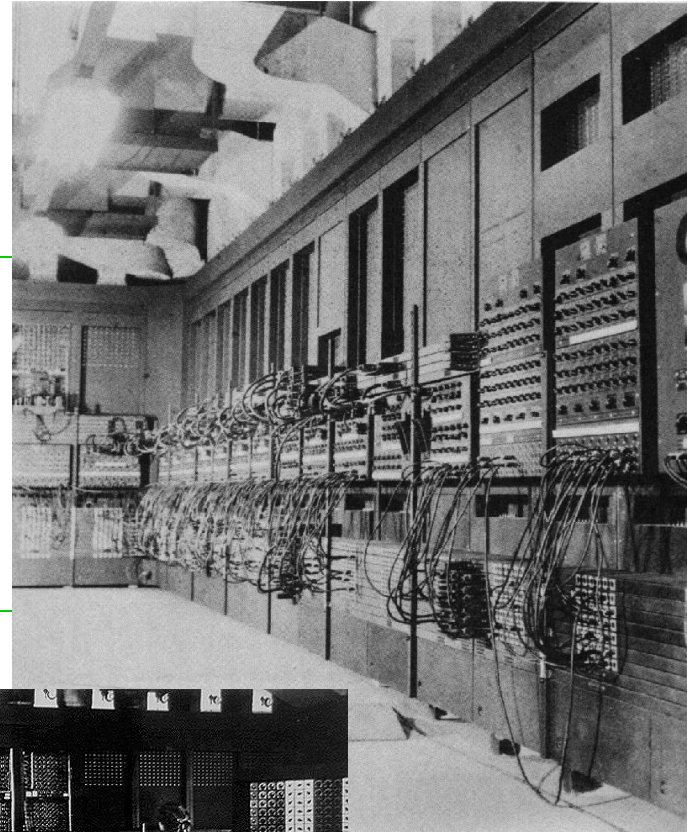
Disadvantages

- Hot
- Burn out



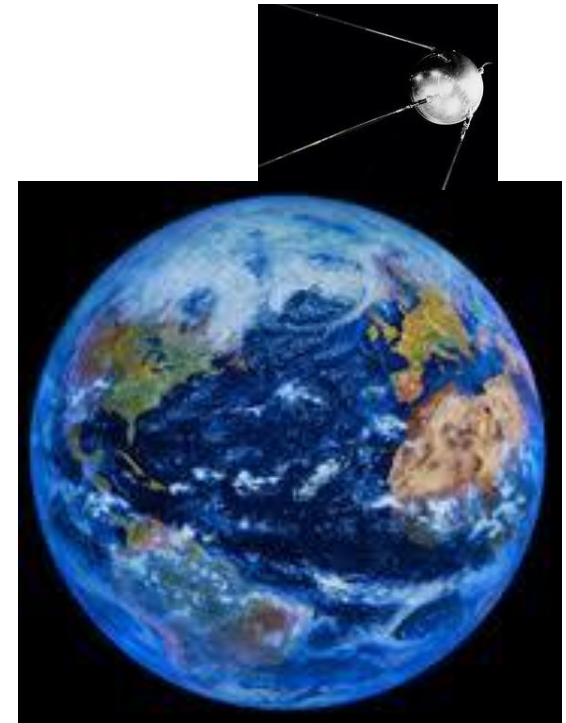
Eniac

- Philadelphia, Pennsylvania
- 1943
- Vacuum tubes
- Fixed programming
- Used until 1955
 - More arithmetic than entire human race up to that time



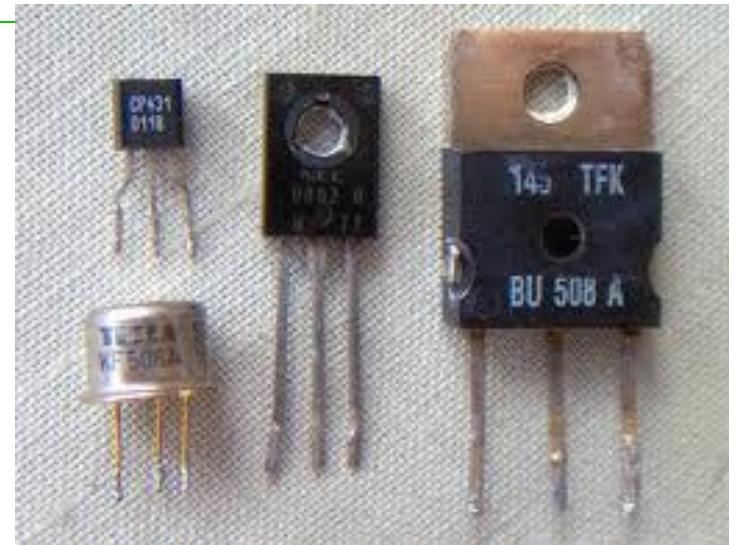
The Cold War

- Russia and United States
- Possibility of nuclear war
- Led to space race
- Satellite must have computer
 - Vacuum tubes
 - Weight and size

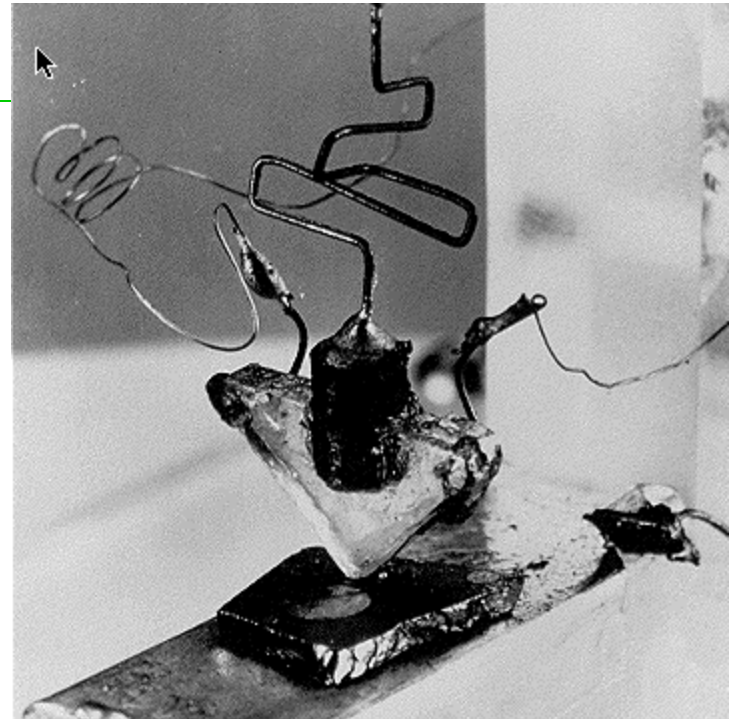


Second Generation Computers 1956-1963

- Transistors
- Smaller size
- Assembly language - easier programming
- Stored programs
- COBOL, FORTRAN

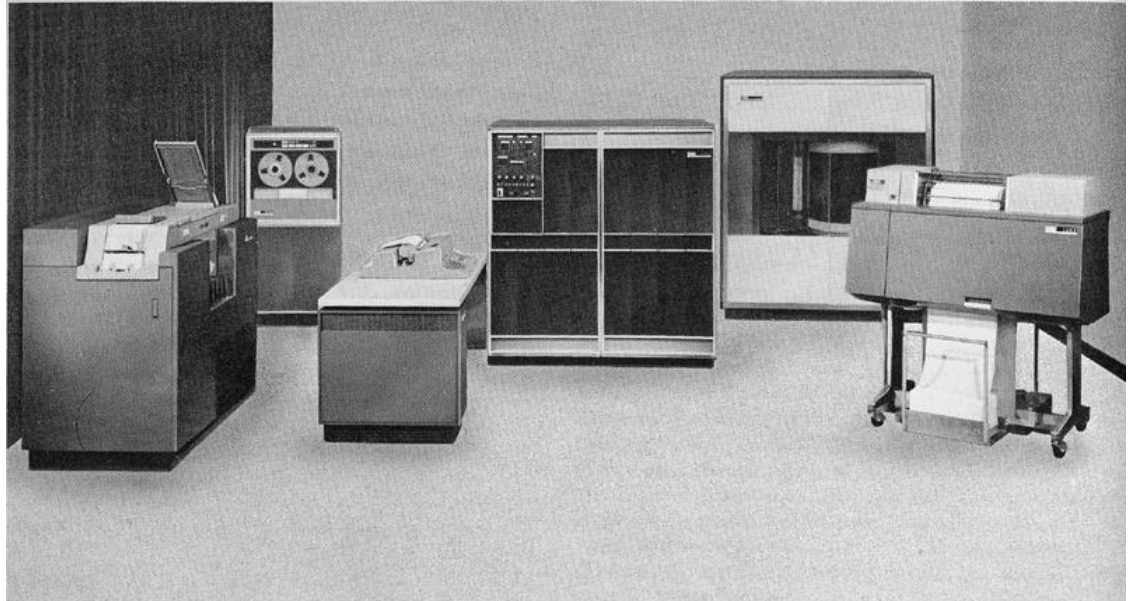


- 1954 - Transistor
- Walter Brattain and John Bardeen
- Used silicone



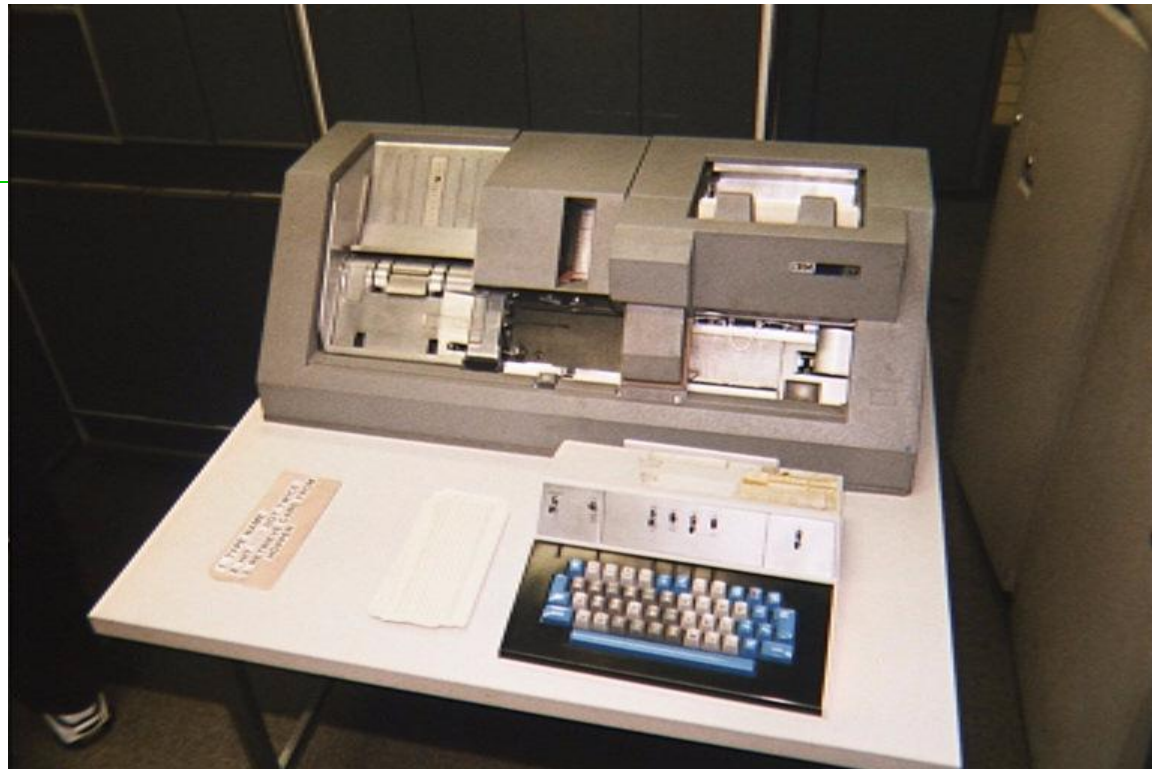
IBM Computers

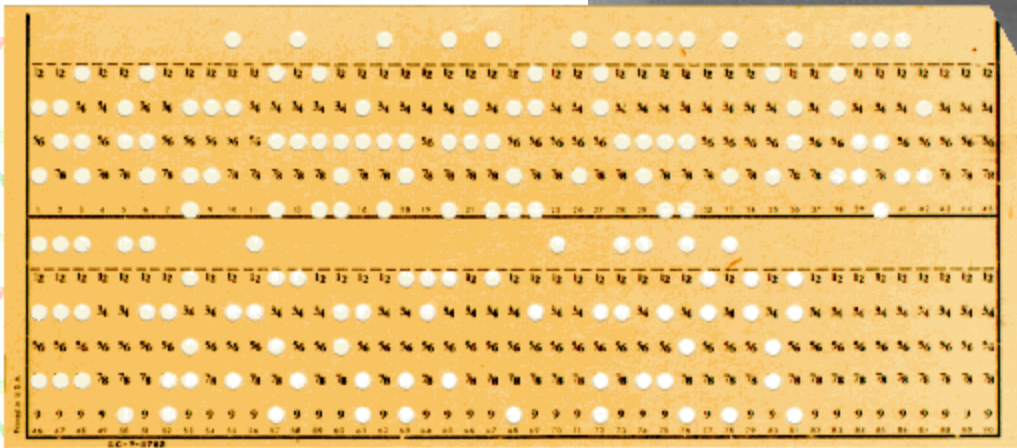
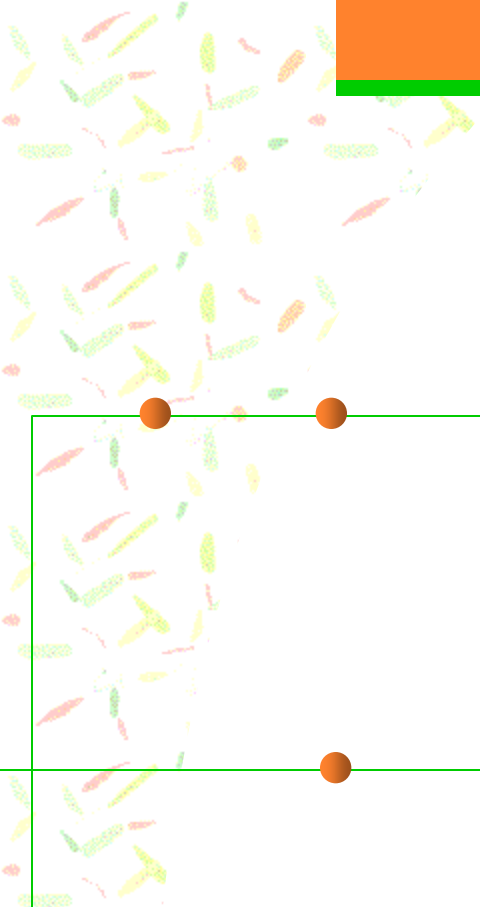
- Mainframe computers
- Stored data using punched cards



Punched cards

- Machine to produce cards





<http://www.youtube.com/watch?v=UZVEp78bOXI>

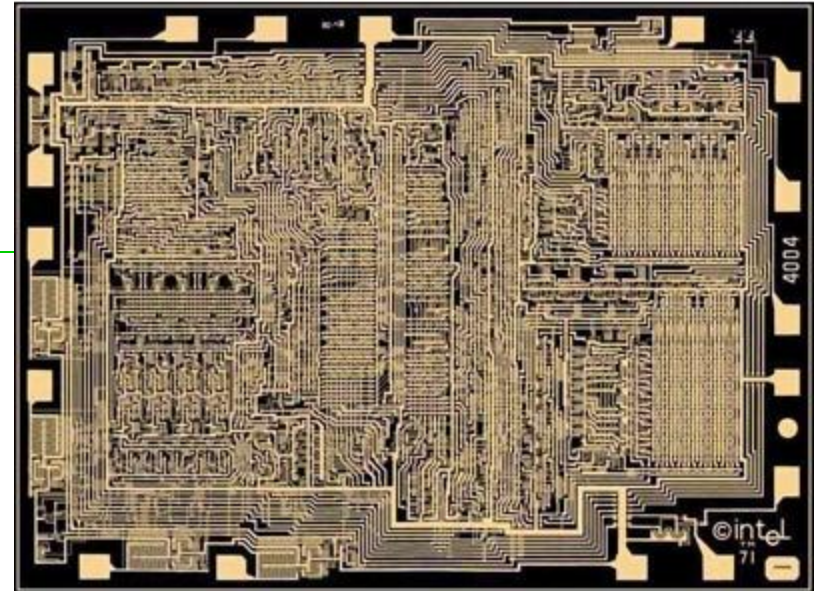
Computer mouse

- 1963 - Douglas Englebart invents mouse



Third Generation Computers 1964-1971

- Integrated circuit
- Silicon chip
- Even smaller size
- Operating system -
could run many
different programs at
once



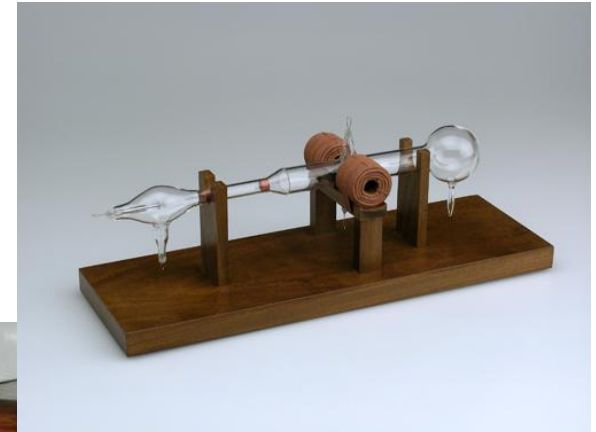
Fourth Generation Computers 1971-Present

- Microchip
- Minicomputers
- User-friendly
- Personal computers
- Networking



Technology Marches On

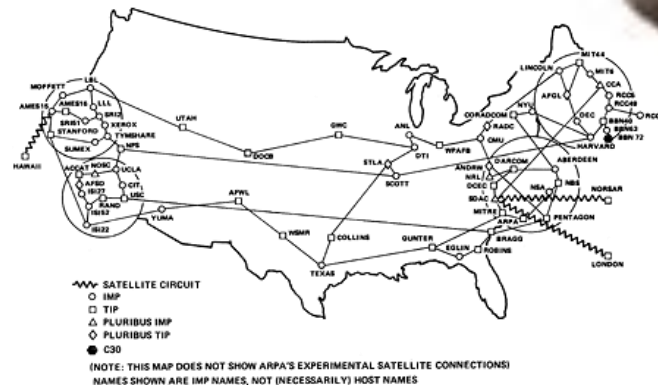
- 1843-First telegraph
- 1877-Thomas Edison and phonograph
- 1885-Cathode Ray tube
- 1891-First motion picture
- 1936-Magnetic tape recording (Magnetophone)
- 1941-First regular TV broadcast



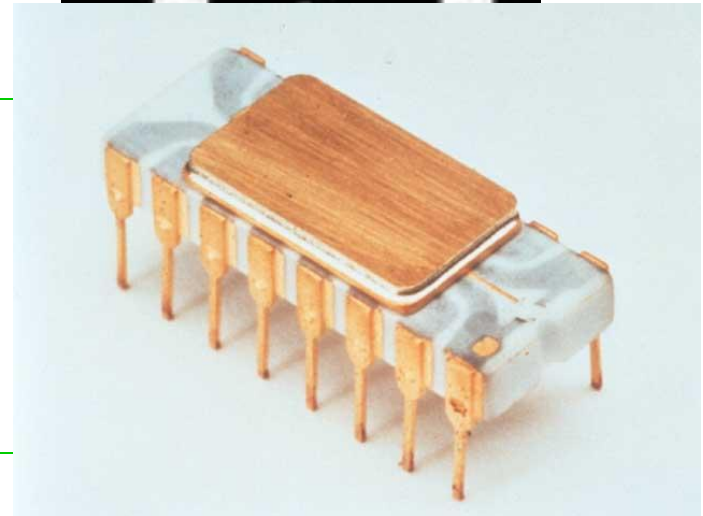
- 1954-Color TV
- 1956-Videotape recording (A)
- 1960-coupler modem
- 1962-First video game – Sp
- 1963-Mouse invented
- 1967-floppy disk
- 1968-Intel founded
- 1969-Invention of Graphical Interface (GUI)
- 1970-ARPANET begun



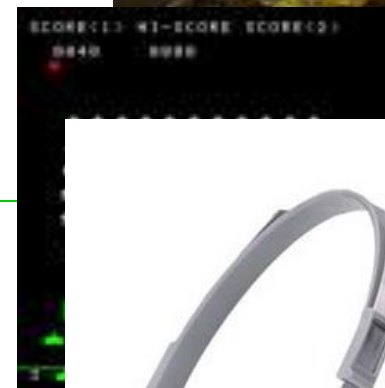
ARPANET GEOGRAPHIC MAP, OCTOBER 1980



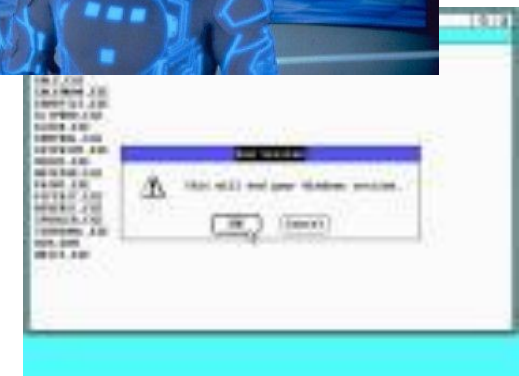
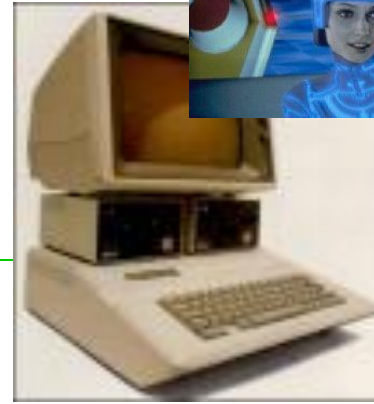
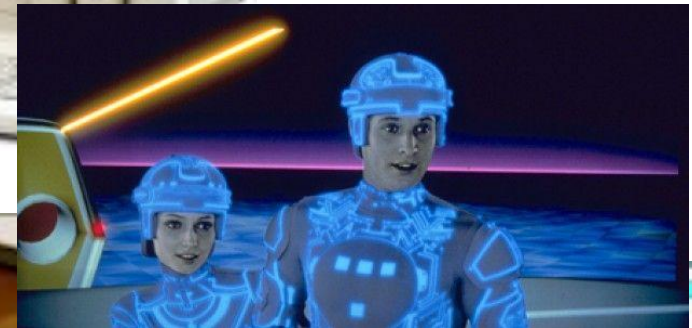
- 1971-Microprocessor – Intel 4004
- 1972 - Atari founded -Pong
- 1972 - Bill Gates forms company - Traf-O-Data
- 1973 - Micral - first microcomputer kit
- 1975 - Bill Gates - BASIC Programming language -
- 1975 - Traf-O-Data name changed to Micro



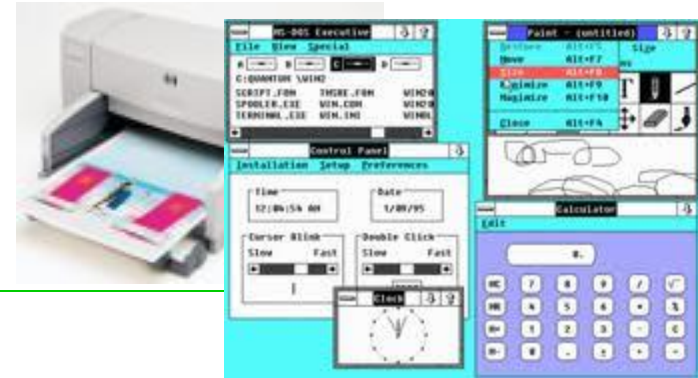
- 1976 - Steve Jobs and Steve Wozniak form Apple Computers - Apple I kit
- Radio Shack TRS-80 computer
- 1978 - Intel 8086 microprocessor
- 1978 - Space Invaders game (Taito)
- 1979 - CompuServe - games and bulletin boards
- 1979-Video laser disk
- 1980 - 3 1/2 inch floppy disk
- 1980-Sony Walkman
- 1981 - MS-DOS



- 1981 - IBM Datamaster - desktop computer
- 1982 - Disney -Tron
- 1983 - Apple IIe computer
- 1984 - Macintosh computer
- Lisa - first GUI
- 1984 - IBM Portable PC
- 1984 - First Compaq computers
- 1985 - Gateway computers
- 1985 - Windows 1.0
- 1985 - Nintendo founded
- 1986 - 286 computers - 8 MHz



- 1987 - First Excel spreadsheet
- 1987 - Microsoft Works
- 1988 - First CD-ROM
- 1988 - Hewlett Packard inkjet printer
- 1988 - First Internet worm (virus)
- 1990 - Windows 3.0
- 1991 - QuickTime software - digital video
- 1991 - Sound Blaster sound card
- 1991 - Pixar - Disney computer animation
- 1992 - Apple PowerBook laptop computer
- 1993 - CD recordable drive
- 1993 - Jurassic Park



QuickTime Player

P I X A R



- 1993 - Plug and play for PC's
- 1994 - U.S. Robotics 28.8 Kbps modem (\$329)
- 1994-Yahoo
- 1994-Iomega Zip drives
- 1995 - First Pentium Pro chip (200 MHz)
- 1995 - First DVD (Digital Video)
- 1995 - Sony Playstation
- 1995-Windows '95
- 1995-Toy Story



- 1996 - Microsoft Internet Explorer
- 1996-Web TV
- 1996-Google
- 1996-Palm Pilot
- 1996-Intellimouse



GOO



1997-1998 (year you were born)

- 1997-Sub \$1000 computers
- 1997-DVD
- 1997-Facebook.com
- 1998-Dancing baby
- 1998 - Windows '98
- 1998 - iMac



1999 (1 year old)

- 1999-Office 2000
- Blackberry



2000 (2 years old)

- 2000-Y2K
- 2000-Napster
- Windows ME



2001 (3 years old)

- Wikipedia
- Ipod
- Xbox
- Wireless techn
- e-Books
- Windows XP
- Satellite radio



2002 (4 years old)

■ eBay



2003 (Kindergarten)

- iTunes
- Hybrid car



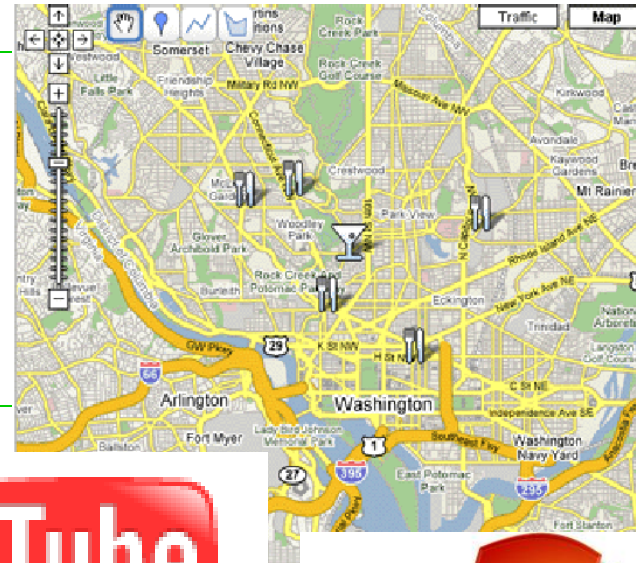
2004 (First grade)

- MySpace
- Gmail
- World of Warcraft



2005 (Second grade)

- Google Maps
- YouTube
- Windows Vista
- Xbox 360

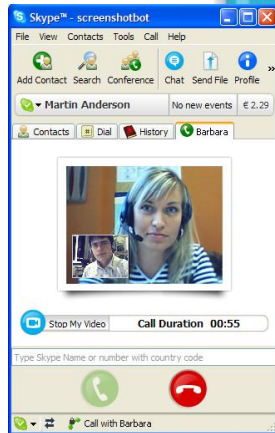


Windows Vista™



2006 (Third grade)

- Blu-ray
- Twitter
- Skype



2007 (Fourth grade)

- iPhone
- Windows 2007

0.48 inches
12.3 mm



4.5 inches
115.5 mm

2.4 inches
62.1mm



2008 (Fifth grade)

■ iMac



2009 (Sixth grade)

- Bing
- Nook

YAHOO

bing™



2010 (Seventh grade)

■ iPad



2011 (Eighth grade)

- 3D TV and movies



Can't live without them!!

- Facebook
- Cell Phones/Texting
- MP3 Players and iPods
- DVD/Blu-ray player
- GPS (Global Positioning Systems)
- Video Gaming Systems



Fifth Generation Computers Present - ???

- Artificial intelligence
- Spoken word instructions
- Superconductor

