

Multimedia Systems - History -

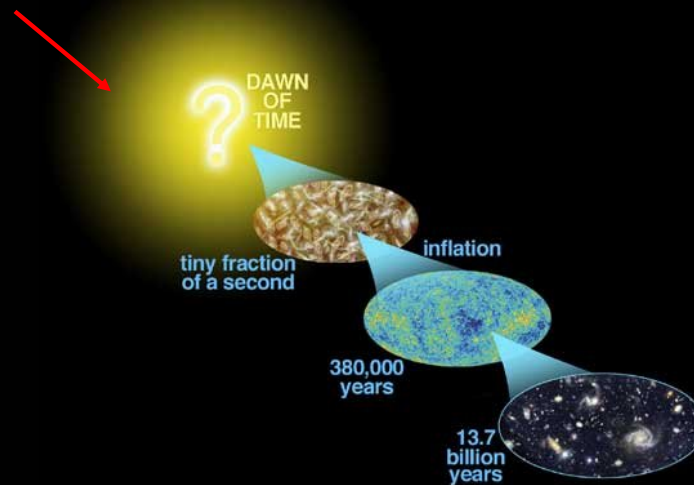
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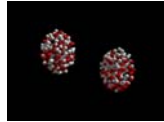
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The History of
Multimedia
starts here



Evolution of the Universe

- ☐ Before 10-15 billion years: **The Big Bang**
- ☐ 10^{-43} sec later: **Gravitation**
- ☐ 10^{-34} sec later: **Quarks and Electrons**



- ☐ 10^{-5} sec later: **Light**
- ☐ 1 min later: **Helium, Oxygen & Co.**
- ☐ 300.000 years later: **Atoms and Molecules**

- ☐ 1 billion years after bigbang: **Galaxies**



- ☐ 3 billion years after bigbang: **Stars and Solar Systems**

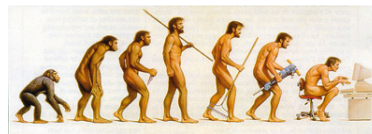
- ☐ 5-10 billion years after bigbang (5 billion years ago): **Earth**



➔ The evolution of the universe seems to slow down!

Evolution of Life and Human Beings

- ☐ 3.4 billion years ago: **Living organisms**
- ☐ 1.7 billion years ago: **DNA**
- ☐ 700 million years ago: **Plants and Animals**
- ☐ 200 million years ago: **Dinosaurs and Mammals**
- ☐ 30 million years ago: **Apes**
- ☐ 15 million years ago: **Humans**
- ☐ 5 million years ago: **Tools, Fire**
- ☐ 2 million years ago: **Speech**
- ☐ 500.000 years ago: **Homo Sapiens, Technology**
- ☐ 40.000 years ago: **Homo Sapiens Sapiens (us)**
- ☐ 10.000 years ago: **Agriculture**
- ☐ 6.000 years ago: **Cities**
- ☐ 5.500 years ago: **Written Text**
- ☐ 5.000 years ago: **Abacus, Mathematics**
- ☐ And many other astonishing milestones ...



➔ The evolution of life seems to speed up!

Mechanical and Electrical Inventions

- 📅 3000 years B.C.: **Water Meter**
- 📅 200 years B.C.: **Mechanical Music Machines (China)**
- 📅 725: **Mechanical Watch**
- 📅 1642: **Blaise Pascal: first idea of computing machine (Pascaline)**
- 📅 1694: **Gottfried Wilhelm Leibniz: Computer for Multiplication**
- 📅 1829: **Typewriter (William Austin Bart)**
- 📅 1832: **Charles Babbage: Analytical Machine (first computer)**
- 📅 1837: **Samual Finley Breese Morse: Telegraph**
- 📅 1839: **L. Daguerre: Photograph**
- 📅 1846: **Alexander Bain: Telegram with punched paper tape**
- 📅 1854: **Telegraph line between Paris and London**
- 📅 1876: **Alexander Graham Bell: Telephone**
- 📅 1899: **Magnetic audio recording**
- 📅 1901: **Electronic Typewriter**



Pascal



Leibniz



Babbage

➔ The Development of Technology seems to speed up!

Multimedia History

☐ 1877: Thomas Edison Phonograph

- First device for recording and playing back sounds. A diaphragm directly controlled a needle, and the needle scratched an analog signal onto a tinfoil cylinder.
- To play back, the needle moved over the groove scratched during recording. During playback, the vibrations pressed into the tin caused the needle to vibrate, causing the diaphragm to vibrate and play the sound.



© Photo courtesy of U. S. Department of Interior, National Park Service, Edison National Historic Site.

Multimedia History



Thomas Edison
(1847-1933)



Engraving of „Mary had a little lamp“
First recording ever on tinfoil!
6. Dec. 1877
(unfortunately not preserved)
(Re-Recorded by Edison in 1927)



1899 Phonograph Model

Comparison: Aida using GSM

©Image: <http://en.wikipedia.org/wiki/Gramophone>

© Images: <http://history.acusd.edu/gen/recording/qt/TAE1927.mp3>

Multimedia History

□ 1887: Emil Berliner : Gramophone



Emile Berliner
1851-1929



This phonograph was improved by Emil Berliner in 1887 to produce the gramophone, which is also a purely mechanical device using a needle and diaphragm. The gramophone's major improvement was the use of flat records with a spiral groove, making mass production of the records easy.



Lincoln's speech at Gettysburg
Author: Abraham, Lincoln
Performer: W.F. Hooley
CREATED/PUBLISHED
New York: E. Berliner's Gramophone,
1898 September 21

© Photos courtesy of the Emile Berliner Museum, Montreal (<http://osiris.teccart.qc.ca/berliner/index.html>)

Multimedia History



Emile Berliner



Rubber Disc from 1895



Logo of the British Gramophone Company, renamed HMV (for *His Master's Voice*) and now the core of today's EMI.



"Columbian anthem" sung by Haydn Quartet ca. 1895

© Photos courtesy of the Emile Berliner Museum, Montreal (<http://osiris.teccart.qc.ca/berliner/index.html>)

Multimedia History

□ Portable Gramophones (Model 101, since 1925)

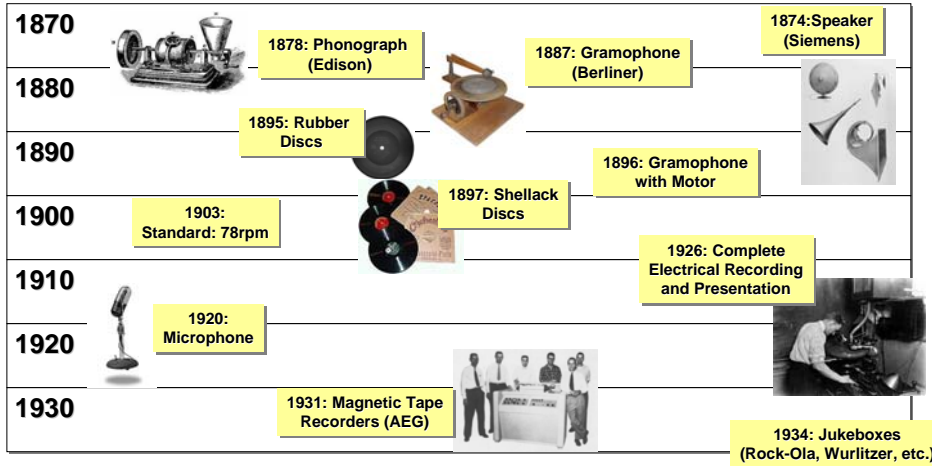


Example:
Noel Coward (1899 – 1973)
Mad Dogs and Englishmen, 1932

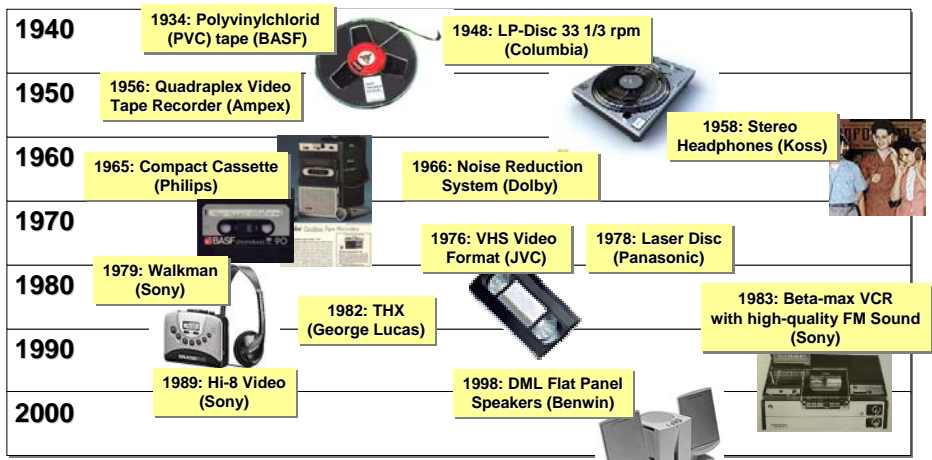


© Photos courtesy of Dave Cooper – The Perfect Portable Gramophone, New Cavendish Books, London, 2003

The Analog Era



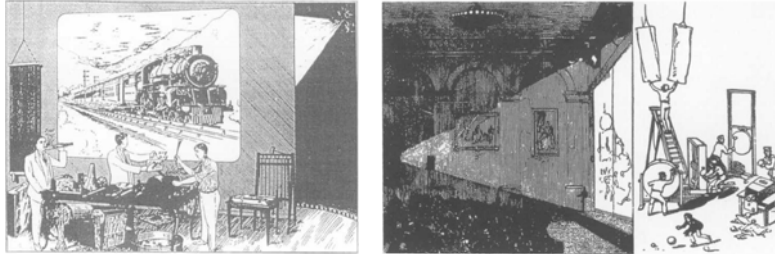
The Analog Era



Film and Sound

❑ Hand-made Multimedia

- Sound effects made from behind the screen, beginning of 20th Century
- Complex setup, expensive performances
- Non-reproducible quality



© Paolo Cherchi Usai, Curator of [Olin, George Eastman House, Rochester, New York]
<http://www.framtid.org/sound-effects-man.pdf>

Film and Sound

❑ Early Experiments to combine Film and Sound

- Edison's Black Maria Studios, 1894/95, W.K.K. Dickson
- Sound is recorded using a Phonograph and played during cinema shows
- Synchronization was achieved by connecting the projector at one end of the theater and the phonograph at the other end with a long pulley
- Nineteen talking pictures were produced in 1913 by Edison, but by 1915 he had abandoned sound motion pictures, because the synchronization was not perfect



[Dickson Experimental
Sound Film]

Sept. 1894-April 2, 1895
Edison's Black
Maria Studio

© Library of Congress, USA, <http://lcweb2.loc.gov/ammem/edhtml/edmrrg.html>

Film and Sound

❑ Analog Mono Sound direct on Film, 1943



Sound Track

Film and Sound

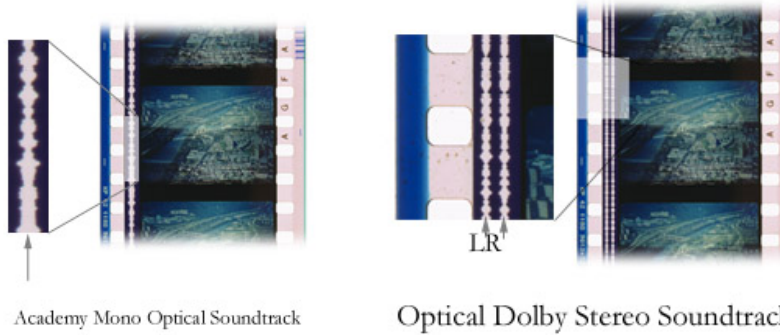


Sound Recording and Reproduction (Sound on Film), 1943
© Producer: Encyclopaedia Britannica Films, Source: <http://home.golden.net/~miq/films.html>

Film and Sound

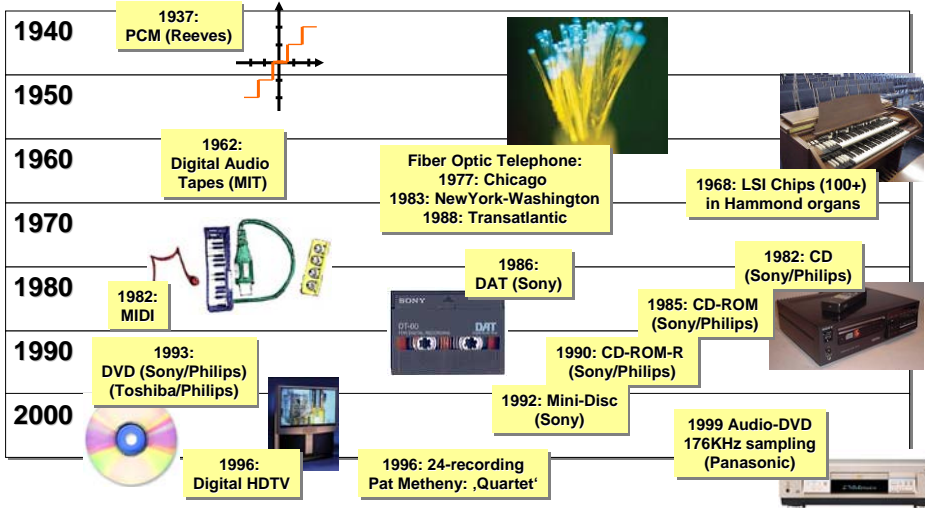
□ Stereo Dolby Sound on Film Today

- Two and even 4 sound channels in the same place of the film



© Dolby Systems Inc.

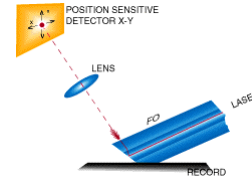
The Digital Era



Analog vs Digital

☐ Sometimes a combination makes sense

- Example: Optical Turntables
- Ecole Polytechnique Fédérale de Lausanne
(http://metwww.epfl.ch/lecteur_disques/LectDiscE.htm)
 - Optical fibre instead of needle
 - Advantage: significantly reduced impact on record medium



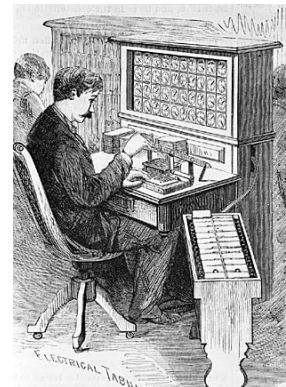
- ELP Cooperation
(<http://www.laserturntable.com/>)
 - Optical Laser scanner instead of needle
 - Advantage: no physical contact at all!



Computer History

☐ Computer Era 0 – Human Computers (~300 - 1960)

- Paradigm: Human beings perform calculations using some simple machines (predominantly women)!
- “Computer” was originally a job title to describe those human beings whose job it was to perform the repetitive calculations required to compute such things as navigational tables, tide charts, and planetary positions for astronomical almanacs.
- Electronic computers (and the earlier mechanical computers) were given this name because they performed the work that had previously been assigned to people.



Computer History

❑ Computer Era 1 – Mainframes (~1960-1980)

- Paradigm: Humans share a rare and expensive resource
- Central, “powerful” and expensive computer
- Many users access a single computer from “dumb” terminals
- Computers not easily accessible
- Mainly used in enterprise environments
- Users: Experts
- Usage: Explicit, well-prepared



Computer History

❑ Computer Era 2 – Personal Computers (~1980-1990)

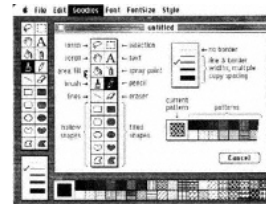
- Paradigm: Each human has its own desktop computer
- “Powerful” and relatively inexpensive computer
- Used for word processing, personal applications, video, audio, etc.
- Users: Everybody, supported by experts
- Usage: Direct



IBM 5150 (1981)



Commodore C64 (1982)

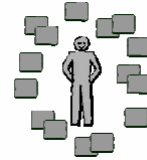


Apple Macintosh (1984)

Computer History

❑ Computer Era 3 – Post PC (~1990-future)

- Paradigm: Each human has a collection of computers
- Explosion in number and variety of computing devices
- Inexpensive devices vary in complexity and functions
- Computers become “invisible”
- User: Everybody
- Usage: Implicit



Multimedia History

❑ References

- Film Sound History,
<http://www.filmsound.org/film-sound-history/>
- CBN History: Radio/Broadcasting Timeline
<http://www.wcbn.org/history/wcbntime.html>
- The Computer History Museum
<http://www.computerhistory.org/>
- The MacTutor History of Mathematics Archive
<http://www-history.mcs.st-and.ac.uk/~history/>
- Computer History Organizations and Museums
<http://ei.cs.vt.edu/~history/museums.html>
- Intel Corporation Museum, Santa Clara, California, USA
<http://www.intel.com/intel/intelis/museum/>



Any Questions?

