



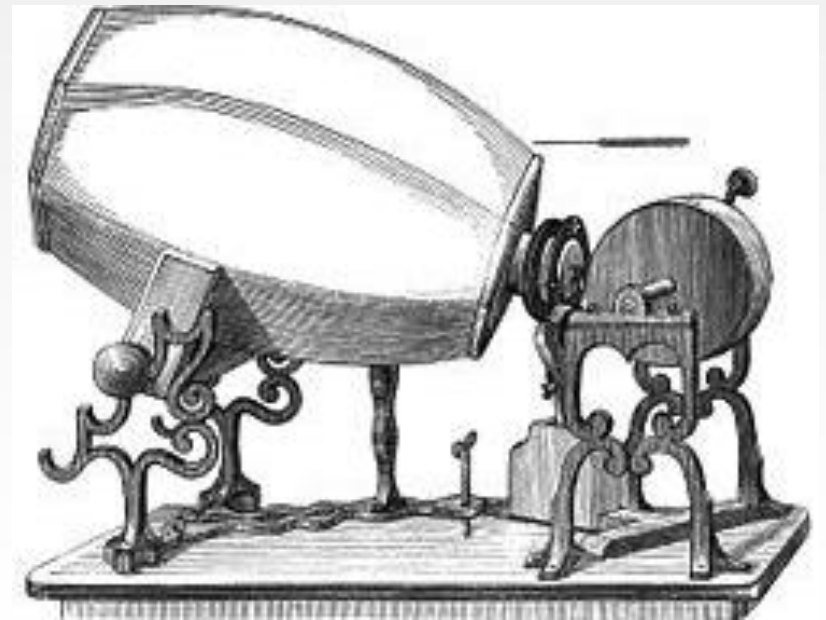
Sound Recoding

Becky Moore, George Newhall, and VJ Alcomindras



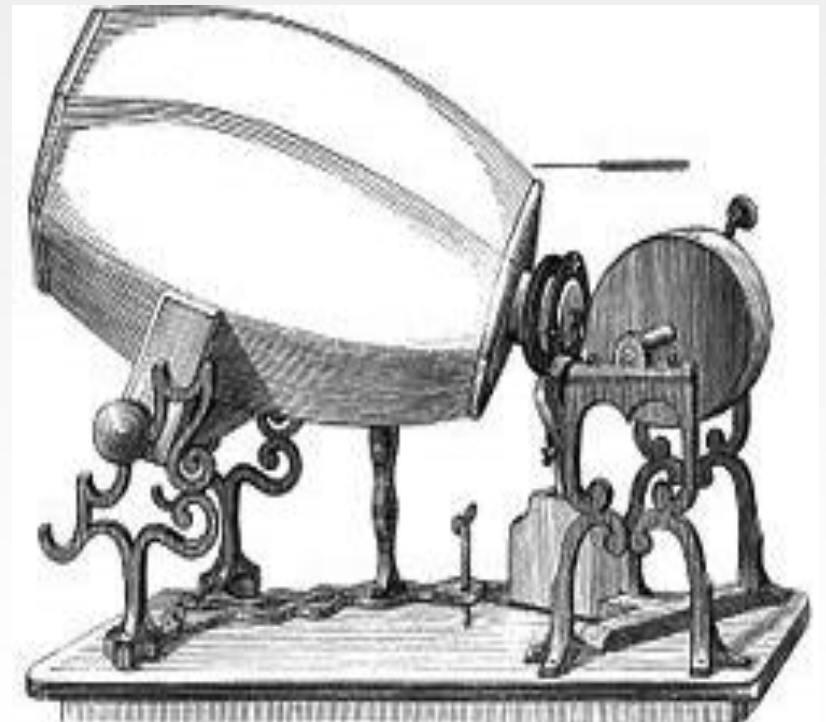
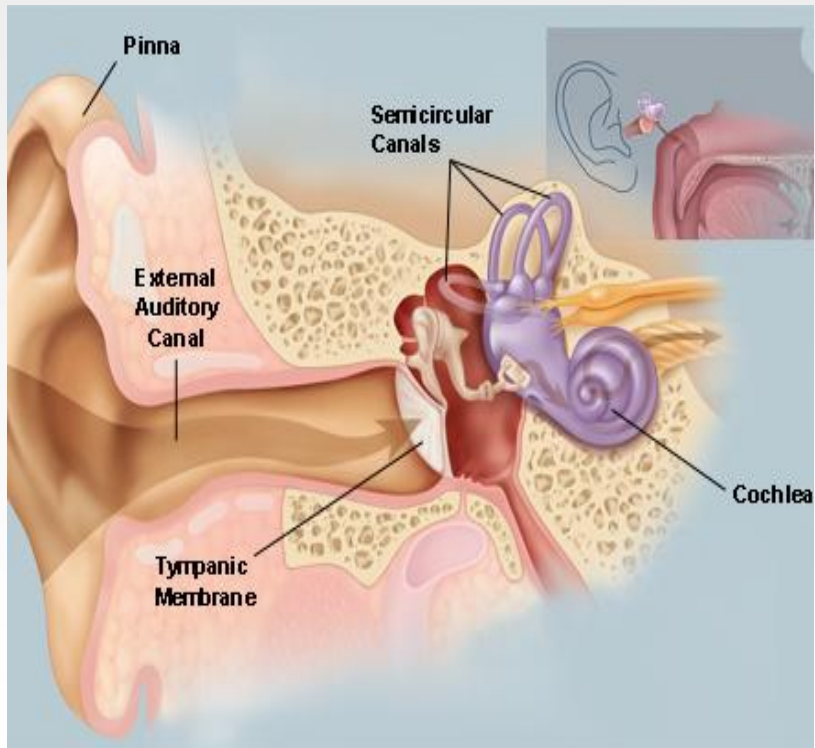
Phonautograph

- Edouard Leon Scott De Martianville
- Traced sound waves could be used to determine musical pitch
- Could not do playback but in the 1980s they were able to digitally recreate it!





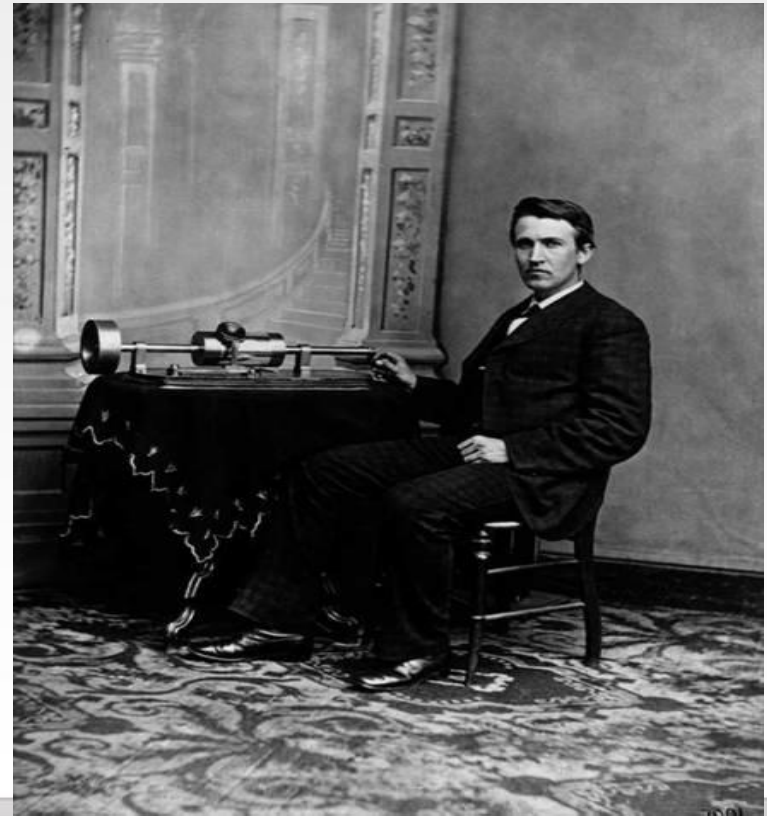
Similar?





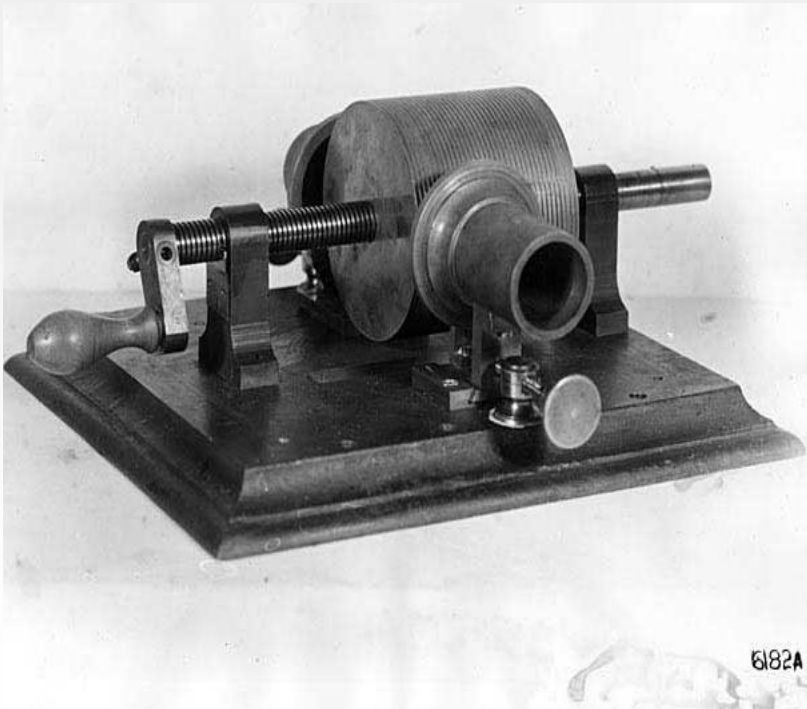
Phonograph and Gramophone

- The Phonograph
- The Gramophone





Pictures!





Videos!

Phonograph

- <http://www.youtube.com/watch?v=LFcrpu00zPM>

Gramophone

- <http://www.youtube.com/watch?v=YG-xJ6UQwgg>



How Records were made

- Master Recording
- Lacquer
- Coating
- Stamper





Analog vs. Digital Recording

Analog

- Records sound and turns it into waves
- Then scratched onto a surface
- Not a very clear sound
- The waves will wear down through use

Digital

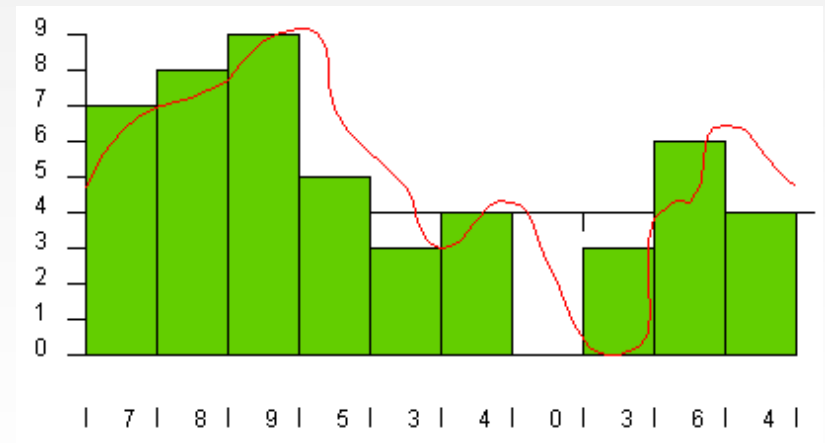
- Converts analog wave into a series of numbers
- Numbers are then recorded digitally
- Converted back to analog wave then amplified and played through speakers
- Sound has higher fidelity and remains consistent



Analog to Digital Converter

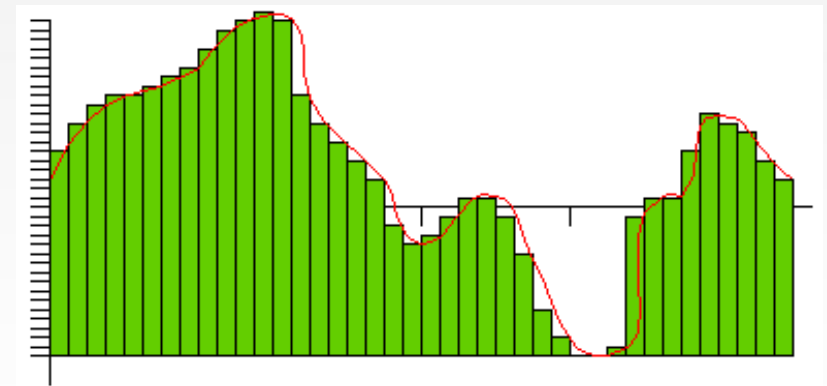
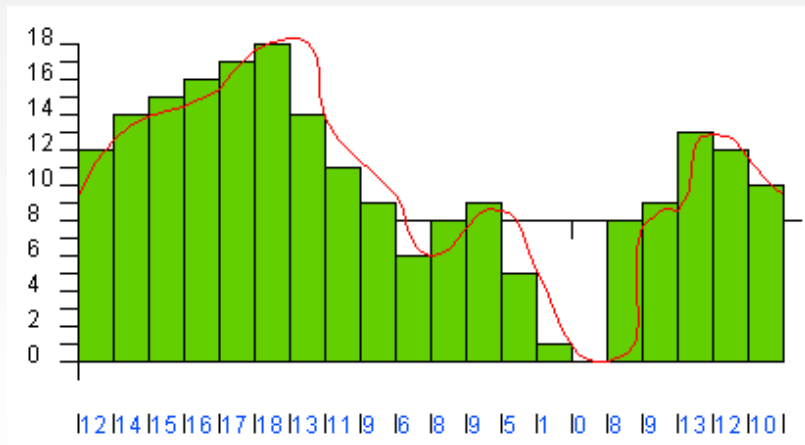
Samples are taken from the wave

- **Sampling Rate:** Controls how many samples are taken per second
- **Sampling Precision:** Controls how many different gradations are possible when taking the sample





Which is more accurate?





CD's

Making the master

- Polished glass blank disk covered in a thin layer of photosensitive material
- Numbers digitally recorded onto the master



Mass Production

- Signal from the master tape controls a high powered laser
- Plastic CD's with the pattern of bumps that correspond to the original pits





Listening

- As the CD spins the info is read off
- The laser reacts to the bumps on the disk
- Digital analog converter sends the appropriate signal
- CD's include repeated info and error coding
- <http://www.youtube.com/watch?v=LEnmSem8C-0>



Cassette Tapes

History of the Cassette Tape

- 1935 AEG introduced the first Reel-to-reel tape recorder.
- The first public use Cassette didn't hit the market until 1964
- By 1968, 85 manufacturers had sold over 2.4 million players
- By the 1970's tapes caught up with the quality of 8-tracks and became a popular alternative to vinyl due to he ability to re-record.





History Continued

- Unlike vinyl Cassette Tapes were very portable with the introduction of Sony's Walkman.
- Portability and durability allowed certain types of music to hard to reach places, such as behind the Iron Curtain.





How Tape Recorders Work

The Tape

- Consists of a thin plastic bonded with a coating of ferric oxide powder.
- The oxide is a ferromagnetic material which means it holds its charge permanently.
 - This allows tapes to record anything instantly and erase any time you like.

Inside the Tape

- Two spools
- Long piece of tape
- Two rollers
- Two halves of the plastic shell
- Small felt pad



The Tape Recorder

- An electromagnet applies a magnetic flux to the oxide on the tape.
- The audio sound is sent through a metal coil to create the magnetic field.
- This creates a pattern on the tape.
- When played back the tape pulls across a gap in the cassette and creates a signal to be amplified by speakers.





Cassette: A Documentary

- <http://www.youtube.com/watch?v=7ect212UsVs>