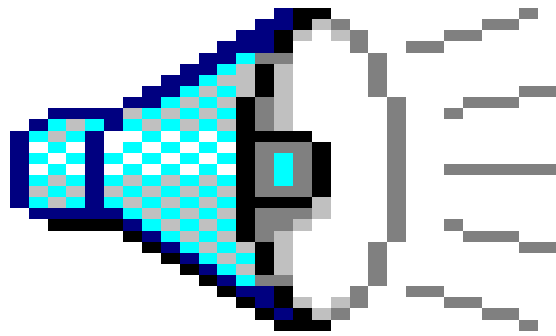


AUDIO MEDIA



AUDIO MEDIA

Sound also adds to the interpretation of the text. If you are an audio learner, you key in on the sounds as much as you key in on the graphics and text. No matter what type of learner you are, the addition of audio will increase your learning productivity. The Audio sub-topic presents information on various phases of audio including how we hear, wave forms, digital audio techniques, sound types, and audio file formats. As you study this section, think about the different types of sound, how they are created, and how you might use sounds in a multimedia project.”

When dealing with audio media, there are two different approaches to recording, saving, and playing these media:

Recorded Sound

sound

voice

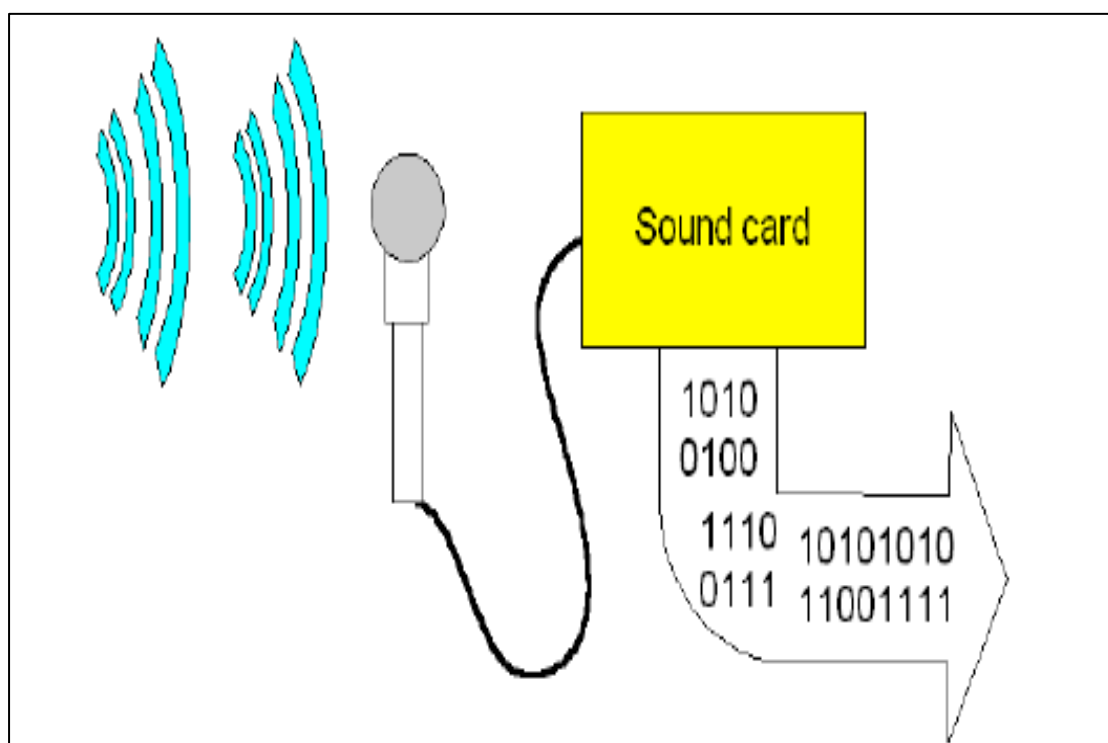
music

Source | Generates Sound

- ✓ Air Pressure changes
- ✓ Electrical | Loud Speaker
- ✓ Acoustic | Direct Pressure Variations

Destination | Receives Sound

- ☒ Electrical | Microphone produces electric signal
- ☒ Ears | Responds to pressure hear sound
- ☒ (MPEG Audio | exploits this fact)



Microphone:

- ✓ Receives sound: Converts to analog signal.

- ✓ Computer like discrete entities. Need to convert Analog-to-Digital | Dedicated Hardware (e.g. Soundcard)

AUDIO HISTORY

1877 - Edison made the first recording of a human voice ("Mary had a little lamb") on the first tinfoil cylinder phonograph Dec. 6 (the word "Halloo" may have been recorded in July on an early paper model derived from his 1876 telegraph repeater) and filed for an American patent Dec. 24. John Kruesi built this first practical machine Dec. 1-6 from a sketch given to him by Edison that was made Nov. 29 (not on "Aug. 12" that Edison mistakenly wrote on another sketch in 1917). When Kruesi heard Edison's first words Dec. 6, he exclaimed "Gott in Himmel!" (but these words for "God in Heaven" were not recorded and thus have been forgotten). Others before Edison had tried to record sound, but Edison and his tinfoil phonograph were the first to succeed.

1878- Edison was granted patent 200,521 on Feb. 19 for a phonograph using cylinders wrapped with tinfoil with 2-3 min. capacity. None of these early fragile tinfoils have survived, but after Edison experimenters used different recording materials, such as the lead cylinder of Frank Lambert that is known today as the oldest surviving playable cylinder ("One o'clock, Two o'clock"), and the brass discs of Augustus Stroh in England ("mama" and "papa").

1881 - Charles Tainter at the Volta Lab made the first lateral-cut records, but without any practical machine to play them back.

1885 - A second type of phonograph was invented by Chichester Bell and Charles Tainter; they were granted patent 341,214 on a machine that they called the "Graphophone" using wax-coated cylinders incised with vertical-cut grooves; see photos from Smithsonian and the essay Tainter and the Graphophone.

1887 - A third type of phonograph was invented by

Emile Berliner; he was granted patent 372,786 for a "Gramophone" using a non-wax disc photo-engraved with a lateral-cut groove; see pictures of the three rival phonographs.

1887 - Edison filed an application Nov. 26 for patent 386,974 on an improved phonograph using a battery-powered electrical motor and wax cylinders, but neither he nor the graphophone inventors were able to mass-produce copies.

1888 - Emile Berliner demonstrated an improved early gramophone May 16 at the Franklin Institute using a flat 7-inch disk with lateral-cut grooves on one side only, hand-cranked at 30 rpm with 2-min. capacity; Berliner was the first to mass-produce hard rubber vulcanite copies from a zinc master disk.

1889 - The Columbia Phonograph Co. was organized January 15 by Edward D. Easton with rights to market a treadle-powered graphophone; however, Easton would have more success selling music rather than business

machines, especially cylinders of the popular United State Marine Band under John Philip Sousa. Easton produced the first record catalog in 1890, a one-page list of Edison and Columbia cylinders.

Sample Rate

Sample rate is the number of samples of audio carried per second, measured in Hz or kHz (one kHz being 1 000 Hz). For example, 44 100 samples per second can be expressed as either 44 100 Hz, or 44.1 kHz.

Bandwidth is the difference between the highest and lowest frequencies carried in an audio stream. The sample rate of playback or recording determines the maximum audio frequency that can be reproduced, as shown below.

- 11.025 KHz | Speech (Telephone 8 KHz)
- 22.05 KHz | Low Grade Audio (WWW Audio, AM Radio)
- 44.1 KHz | CD Quality

Sampling process basically involves: Measuring the analog signal at regular discrete Intervals, Recording the value at these points.

Bit size:

The file size depends upon the sample frequency.

The bit depth refers to no. of bits in each sample, determines the maximum signal to noise ratio.

✓ 8 Bit Value (0-255)

✓ 16 Bit Value (Integer) (0-65535)

