

Recording Technology

...from analog to digital

Analogy?

- drawing a comparison in order to show a similarity in some respect.

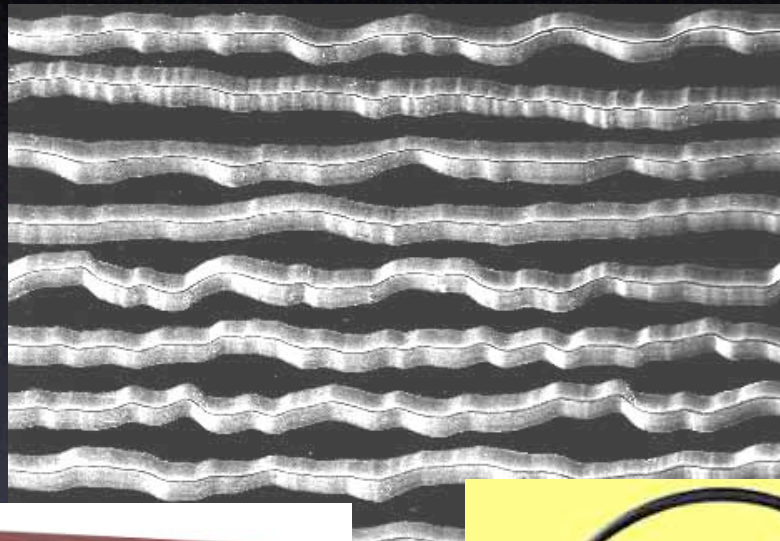
Analog Recording

- Wax Cylinder



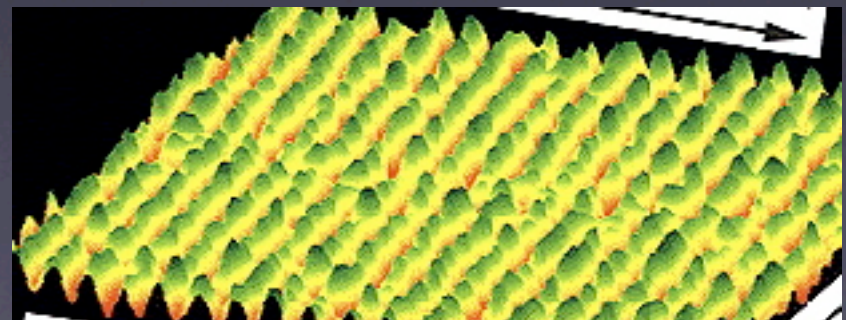
Analog Recording

- Vinyl Disk (Records)



Analog Recording

- Magnetic Tape

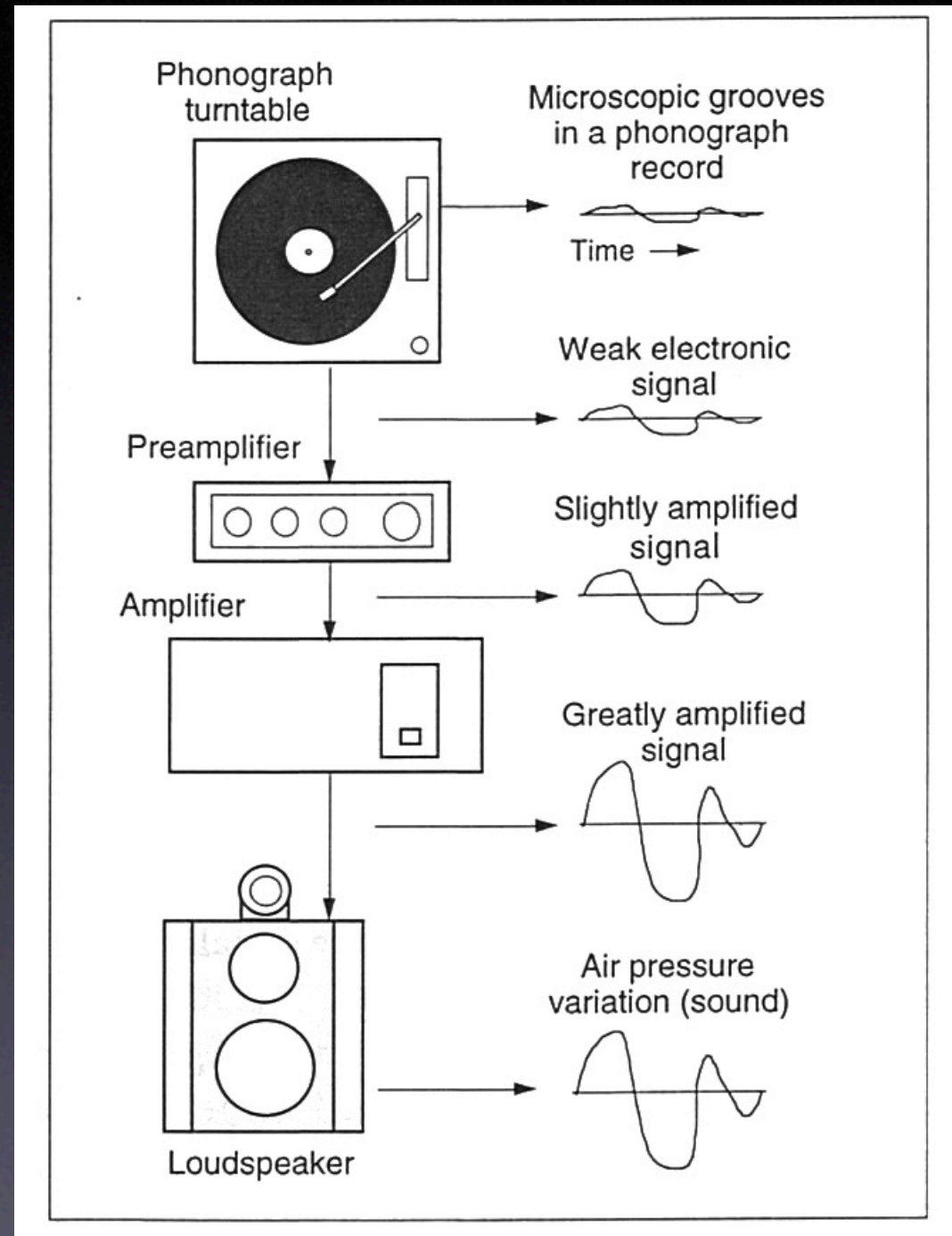


Analog Recording Properties

- waveforms are “similar” to original waveforms
- waveforms are continuous
- subsequent copies are never as good as originals

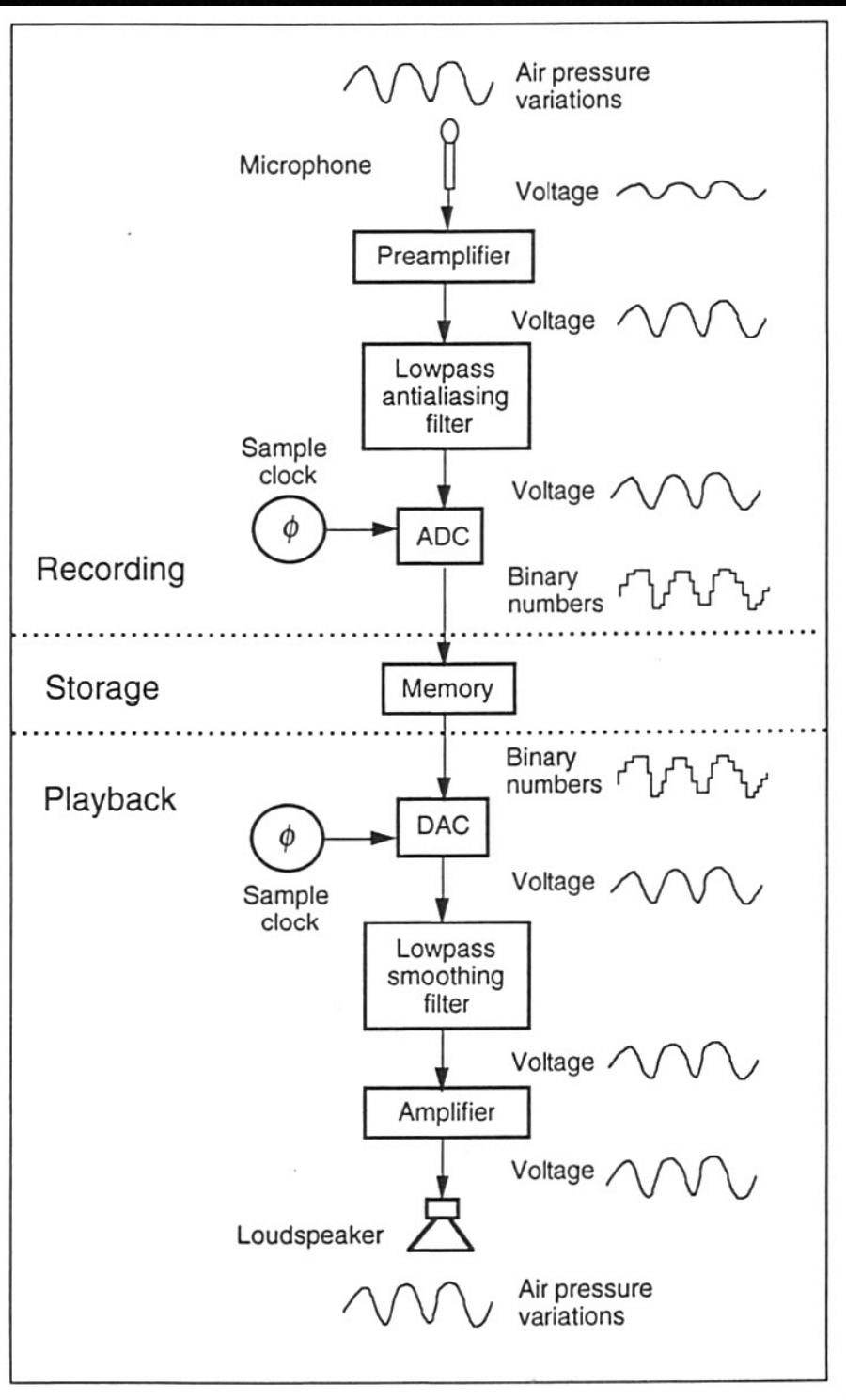
Analog Audio

- Signal Path



Digital Audio

- Signal Path



Digital Converters

- AD

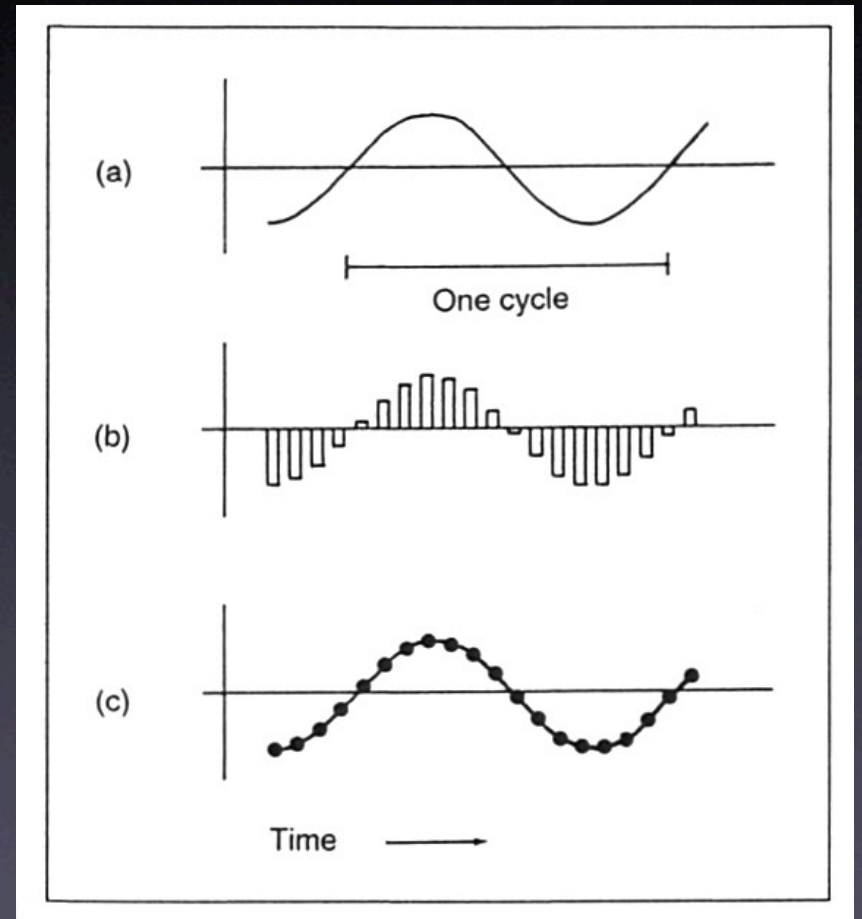
- DA

Digital Conversion Parameters

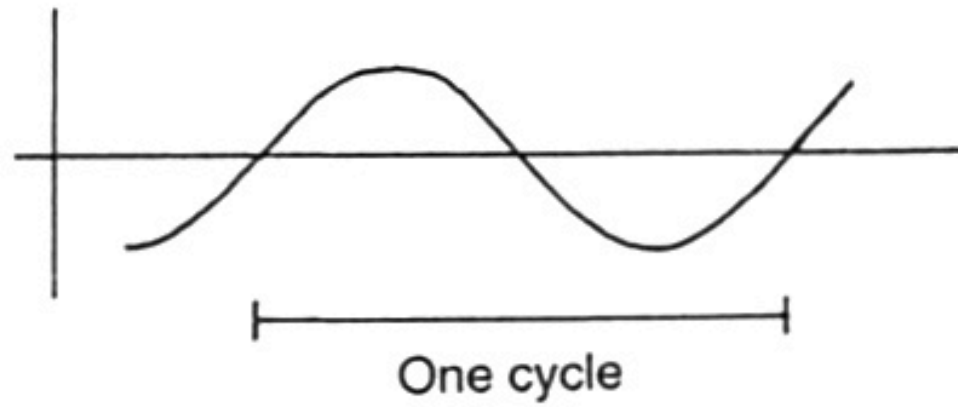
- Sample Rate
- Bit Depth

Digital Conversion Parameters

- **Sample Rate (Hz)**
Number of samples taken per second



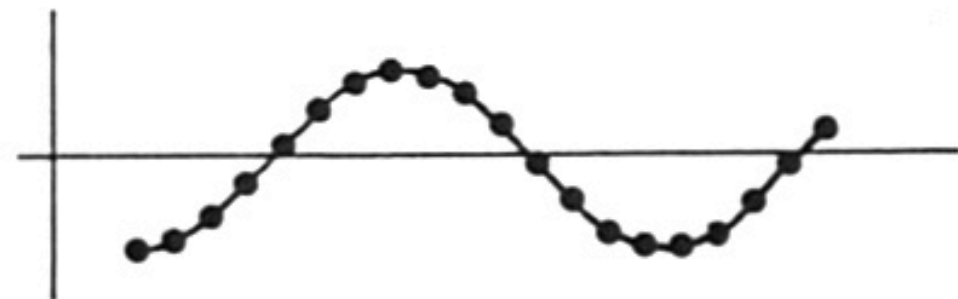
(a)



(b)



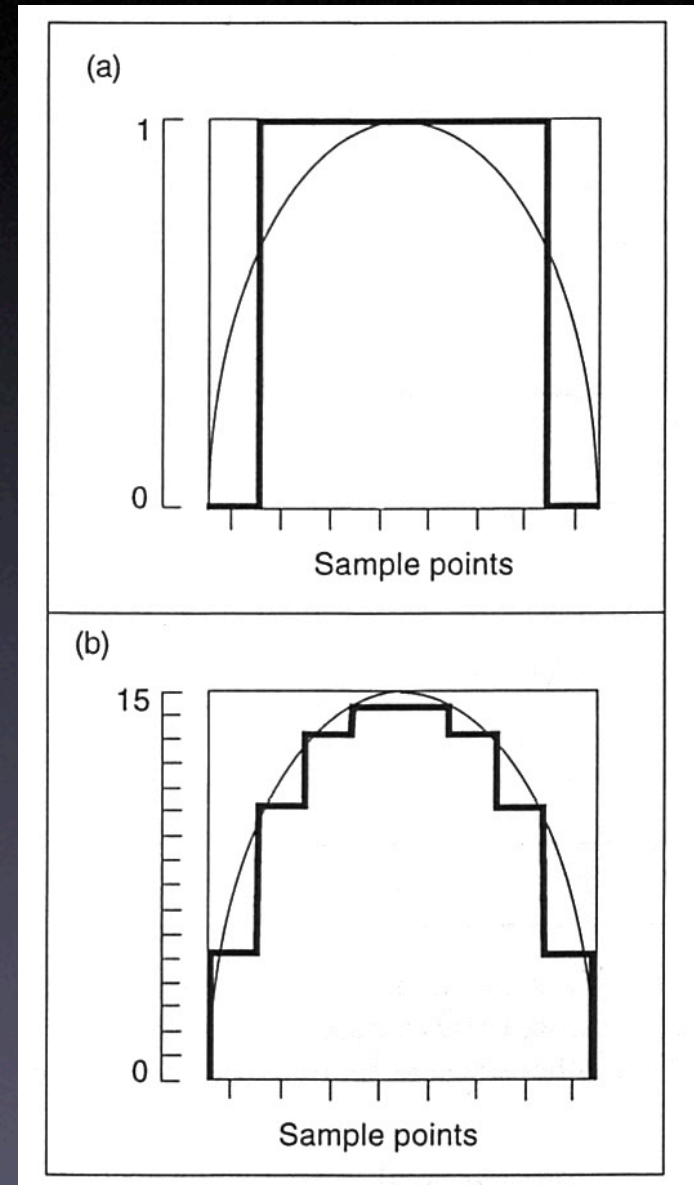
(c)



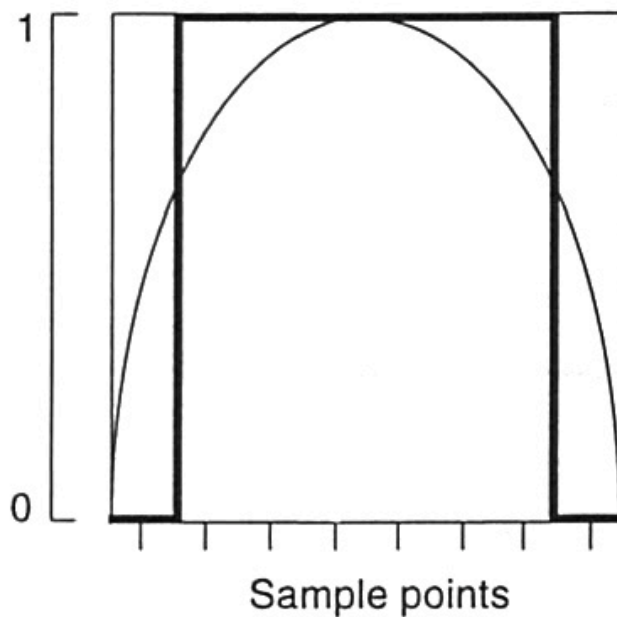
Time →

Digital Conversion Parameters

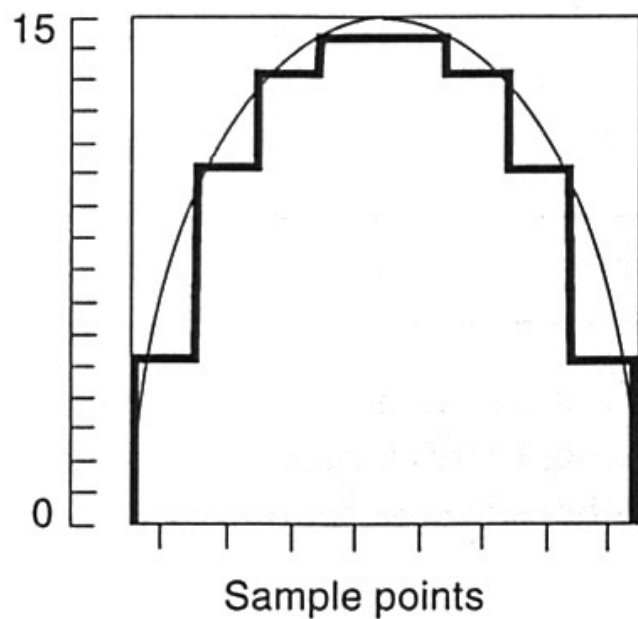
- **Bit Depth (bits)**
Range of amplitude measurement



(a)



(b)



Effect on Fidelity

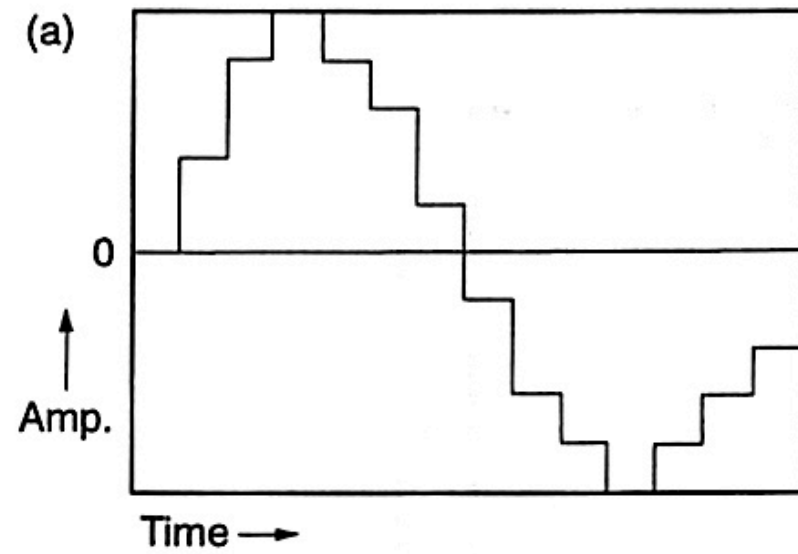
Sample Rate

- * Determines how accurately frequencies are represented

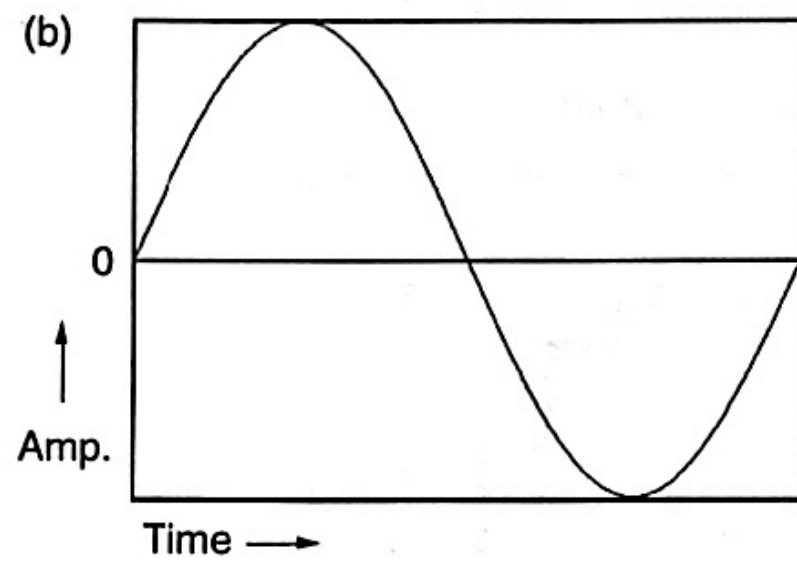
Bit Depth

- * Determines dynamic range

(a)



(b)



Dynamic Range

Human Hearing 0db - 125db

- Each bit enables 6.11 db of range
- How many bits are necessary to cover the range of human hearing?

Digital Recording Properties

- waveforms are “sampled” by converters
- recordings are not continuous
- subsequent copies perfect

