

Lec 1      Wed      1/17/01

Lee Montgomery - head full-time  
Multimedia teacher

Sound Forge XP 4.5

Campus Tech. com      \$ 35.00.  
direct from Sound Forge      \$ 42.00

Tim White: office hours 4:30-6pm Wed  
only  
- headphones w/microphone can be used

Scratch folder for personal use  
bring CD disc or zip disc.

Materials > Tim White for class materials

Drop Box to turn in assignments.

assignment 1: process effects tutorial. wav.  
- keep changing sound file, watch  
effects & make it completely different

minidisc.com - MiniDisc recorder supplier.  
570-848-6703      M-F 9-6pm Sat 11-4pm  
1434 University Ave.  
Berkeley, CA 94702

- learn effects and process menus.  
- can affect part of a file.

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CD Quality: 44,1K sample rate.

44,100 samples/sec

Bit Rate or bit depth.

- CD has 16 bit bit rate.

~ 10 MB/minute of audio storage

72-74 min = 650 MB

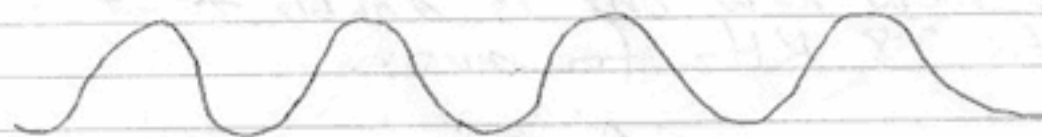
Editing: 2 types - destructive  
- non-destructive



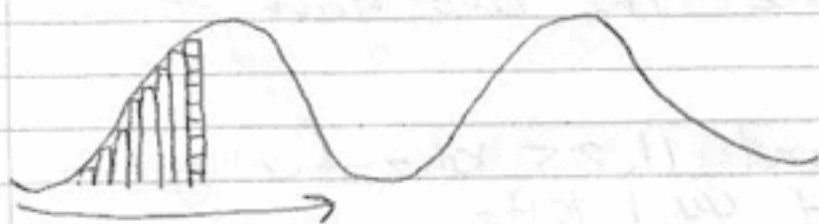
Sound wave is change in air pressure,  
so we are mapping change in  
air pressure.

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Analog - LP, tape, wire:



Digital - sampling:



Samples over time.

- sample rate is very important for sound quality.
- bit rate also important for sound quality.  
↑ bit rate means better quality.

22.5 samples/sec } for computer games  
8 bit depth

2.5 Mb/minute

NYQUIST Rate:

highest frequency  $\times 2 =$  OK sound.

Hz = 1 cycle/sec.

human ear: 20 Hz - 20,000 Hz

so,  $2 \times 20,000 = 40,000$  Hz so 44.1 kHz was chosen standard.

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- there is disagreement over this standard so now new one is double that to 98 KHz for music.

Aliasing: artifacts produced by reducing the frequency content before reducing sampling rate. The two have to work together.

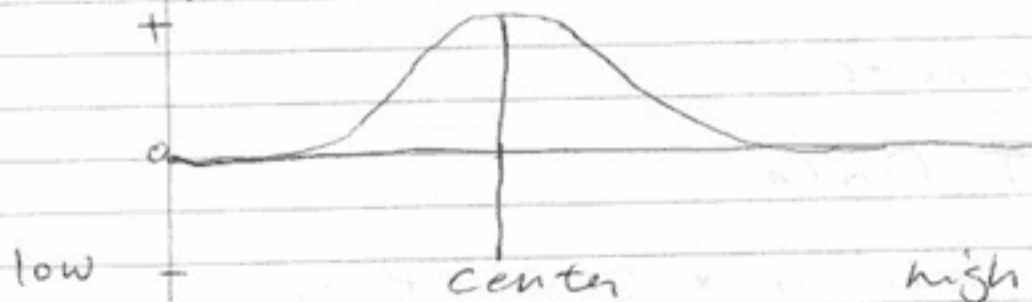
example: need 11.25 KHz for game.  
record at 44.1 KHz  
convert to 22.05 KHz → sounds awful.

20 Hz - 20,000 Hz human range

EQ (equalization)

- changes the frequency content of a sound file.

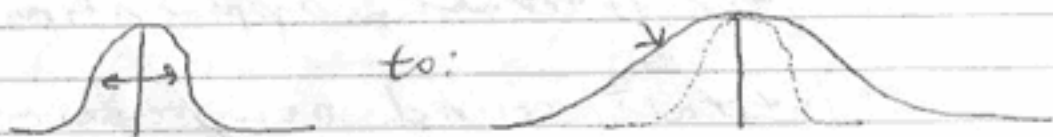
FREQ CONTENT → EQ → SAMPLE RATE



frequency - adjusted by graphic equalizer - not very exact.

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parametric equalizer: adjusts width of bell:



adjust sound in graphic equalizer.  
6K level often adjusted - boosted for singers.

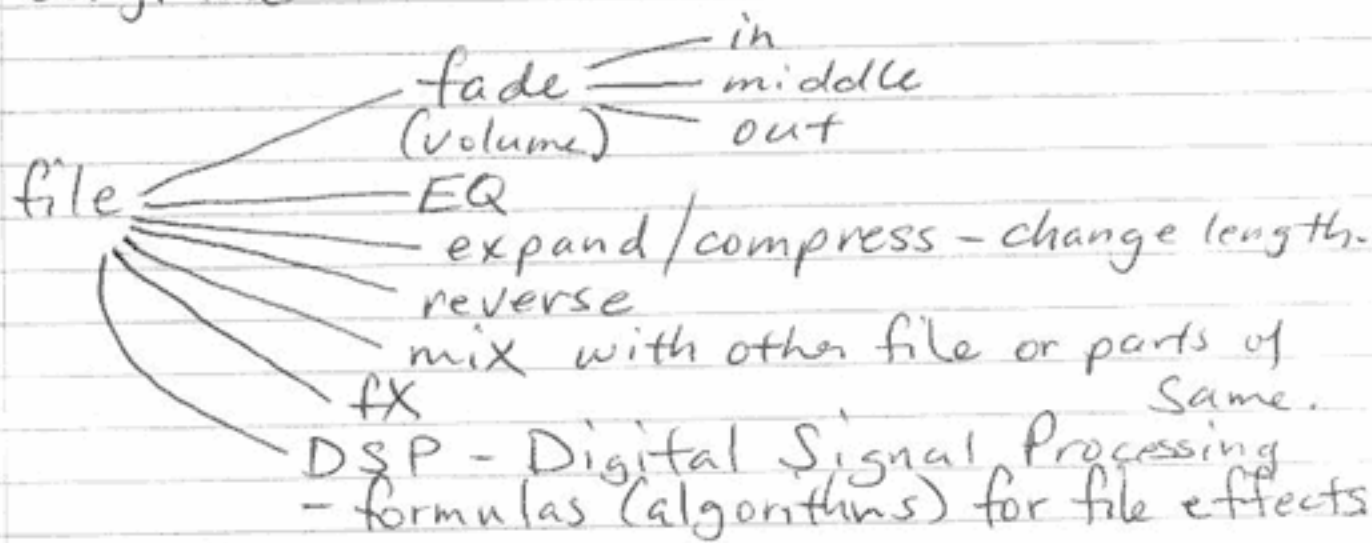
parametric - adjusts bandwidth & centering.

EQ - treble & bass on stereo.  
fixed but changes bandwidth & center frequency

## Modern Recording Technologies

"The Computer Music Tutorial"  
by Curtis Rhodes  
- recommended by Tim.

digital sound file:



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Think about final sound project -  
for internet, application, CD or ....

internet sound compression: MP3

Quicktime: another compression scheme.

We will learn about sound compression.