Delay

Audio Engineering I

Sources:

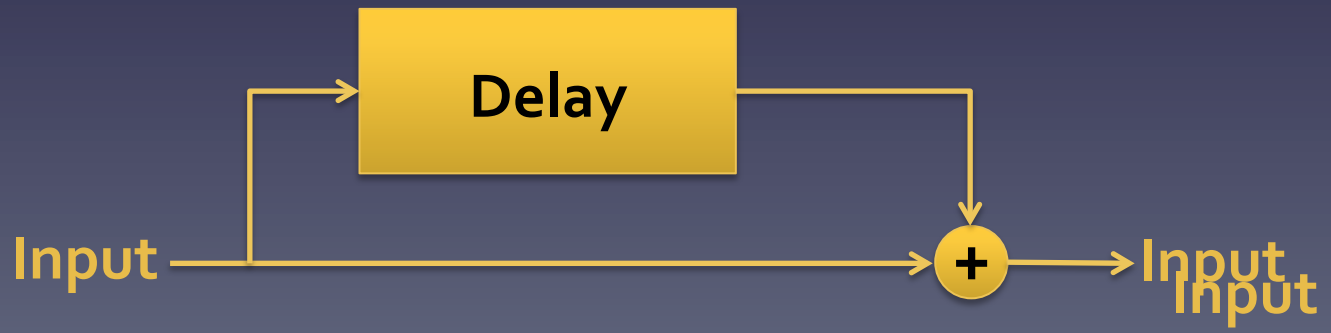
- Huber: *Modern Recording Techniques*, (7th ed.) ch. 14, pp. 503-506
- Smith, Geoff: "Creating & Using Custom Delay Effects," *Sound on Sound Magazine*, May 2012

http://www.soundonsound.com/sos/may12/articles/designer-delay.htm

Visit this site for a very informative article, and the example tracks we listened to in class.

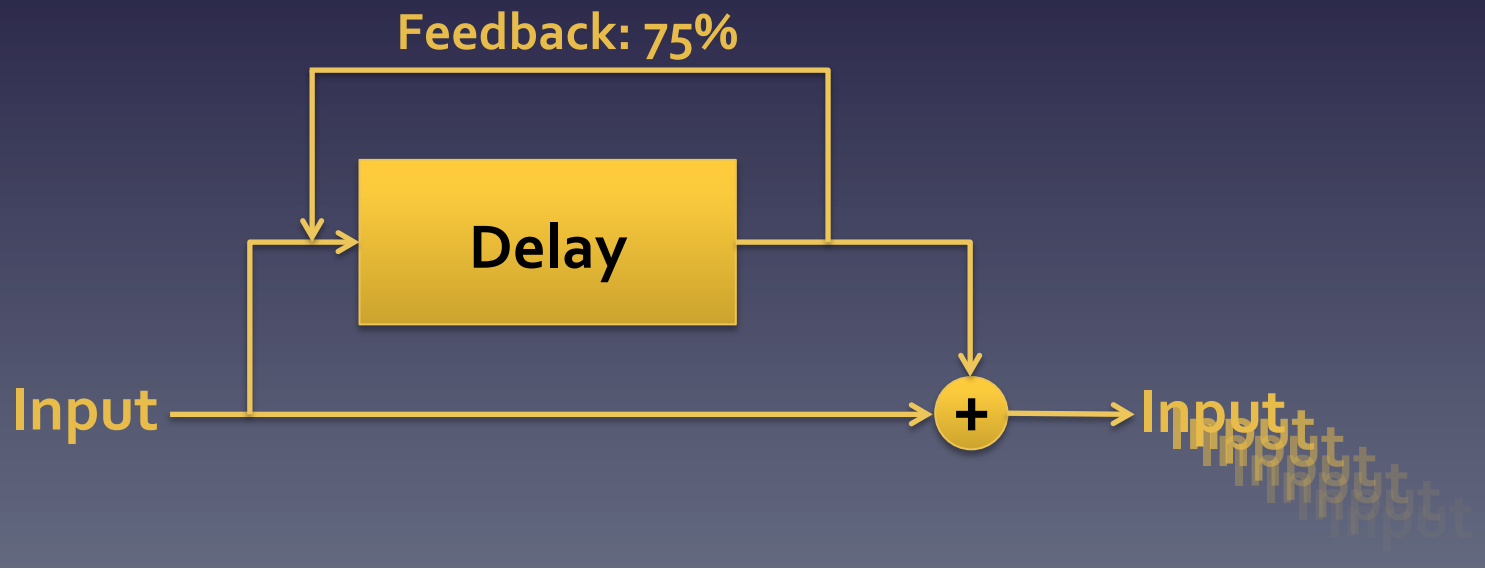
Delay

- Most basic form:
  - A section of audio is stored in memory (a buffer).
  - After a defined period of time (usually measured in milliseconds), the stored audio is played back again and added in with the original sound.



Delay

- **Feedback**
  - Multiple echoes are created when a percentage of the delayed signal is *fed back* into the delay line.
  - At 100%, the delay is never-ending!



Length of Delay

- Short delays (1 sample – 10 ms)
  - 1 to a few samples – acts as a low-pass filter
  - .1 – 10 ms - acts as a comb filter
- Medium delays (10-50 ms)
  - Create a "doubling" effect
  - The delayed sound mixes with the original to create the illusion of being louder, but it doesn't cause an increase in amplitude.
- Long delays (>50 ms)
  - Sounds like a discrete echo

Flanging

- Flanging is constantly fluctuating, but very short delay
- Video: Tape Flanging

Slap-back Delay

- This just means using a single delay of 60-180 ms, much like a "slap-back" echo that would come from a wall ~30 ft away.
- Famously used by Elvis Presley and John Lennon
- Standard for hip-hop vocals

Ping Pong Delay

- A delay effect where the first echo appears in one channel – 'ping' (usually the left), and then it appears in the 'pong' channel.
- If there is feedback enabled, the delays will go back and forth between left and right.

Stereo Widening & Doubling

- "Haas Effect"
  - When two identical signals are played through separate speakers and one is delayed by 1-30 ms, a sense of widening the sound is heard.
- Can create a stereo feel from a mono track
  - Vocal doubling – for example, a mono vocal track can be delayed slightly to sound like two voices. The effect is of two voices singing, and it can be enhanced if they are panned left and right.
- This only works if the delayed sound sources are panned hard left and right (so they come through different speakers)

Using Delay

- Like reverb, delay is typically applied as a send effect.
  - Create an Aux Track, name it, and Insert the Delay plug-in on that track. Then you can send other tracks to the Delay Aux Track.
- **Tempo-sync:** many delay plug-ins have tempo-sync capabilities, which means you can set the delay time to a rhythmic value based on the tempo of your session.

Mod III Delay Plug-in

Delay: How many milliseconds pass before the delayed sound is played back. This is mono delay. If you use the stereo version of this plugin, there will be another delay knob; one for each speaker.

Feedback

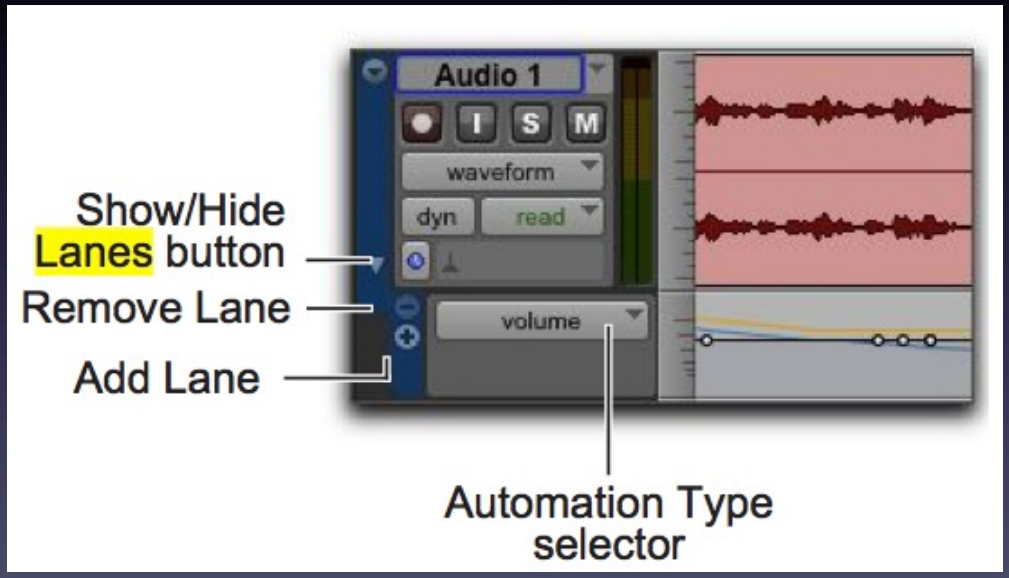
Low Pass Filter: A built-in filter that will cut out high frequencies. You can set the cutoff frequency.

Tempo Sync: you can set the tempo here and use these different rhythmic values to set delay time, instead of using the delay (milliseconds) knob at the top..
If the sync button is on, it will automatically use the tempo and meter of your session.

Delay vs. Reverb

- Delay is more transparent than reverb – it doesn't add as much sound to the mix.
  - This is because reverb is actually many multiple delays.
  - Using delay instead of, or more than reverb keeps a mix from becoming too cluttered and muddy.
- Delay can also be used *with* reverb.
  - Ex: routing a mono delay into a stereo reverb
- Delay can also be used with EQ!
  - Mod III delay comes with a low-pass filter that will cut out high frequencies, but you could also route a delay effect to an EQ effect and change the tone of the delay.

Automation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I
S
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waveform
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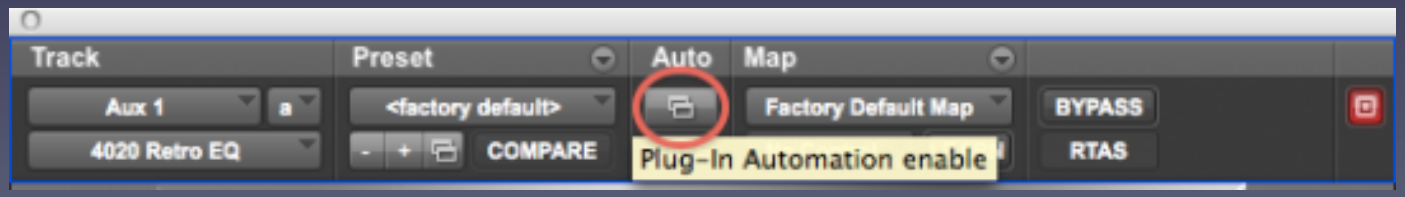
read
volume
Show/Hide Lanes button
Remove Lane
Add Lane
Automation Type selector

Automation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Factory Default Map
BYPASS
4020 Retro EQ
-
+
COMPARE
Plug-In Automation enable
RTAS