1

Equalization (EQ) is used for:

1. Adjusting **timber** of instrument, **formants** of voice, **harmonics** of mix
   …and of effects such as reverb and echo.
   Making it "brighter", "darker", "less boxy", etc

2. Changing the frequency balance a track to make it mix better. That is, to keep the tracks from hiding each other, give each one a little different bandwidth boost.

3. Eliminating a steady state noise. Take that 60 Hz hum out.

4. Fixing a poor recording (a little) by boosting bands that need it.

2

Equalization (EQ) is also used for:

5. Making a recording sound better over a particular speaker system (Compensating for speaker limitations)

6. Compensating for room acoustics

3

Related terms used in EQ controls:

bass – treble simple types of EQ really

bands frequency ranges

boost – cut adding or reducing levels

low end bass frequencies

Q the width of the band you are adjusting
i.e. 200-800Hz is wide Q
200-250Hz is narrow Q

center frequency
the middle of the band you are adjusting

high-pass allows the highs but cuts the lows

low-pass allows the lows but cuts the highs

4

EQ advice:

- Think minimal. Less is often better!
- Technically, **cutting is better** than boosting. Harmonics are left intact. Cut if you are trying to make things sound better. Boost to sound different. Cut with narrow ***Q (band)***. Boost with wider ***Q***.
- Roll off bass to make an instrument stand out. Roll off treble to make it blend in.
- To Sound Bigger, Boost the bass. First sweep to find the frequency that best does it. Then try adding another boost at ½ or twice the initial frequency.

5

Same with "effects" EQ

Busy instruments are better with *high pass* reverb.
(*High pass* means the bass is reduced.)

Slow instruments sound bigger with low end reverb.
"Low end" means putting a high-cut on the reverb.

6

Echo and delay effects:

Reverb: a multiple of random little bits of the original sound, typical of a room with lots of little reflective surfaces, but no big flat reflective walls.

Echo: a recognizable repeating of the sound
It seems to "bounce back" intact.

Delay: (sometimes used to mean *echo*).
In reverb, it sets the time it takes for the first reverb to bounce back to the listener. Reverbs for big rooms need more delay because the sound would take longer to begin bouncing back from the distant walls.

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Reverb Controls:

Damping – the envelope of the reverb
More damping = less intensity
Delay – how soon after original sound does it start?
Dry / Wet – Dry is original sound without the reverb.
100% wet means no original sound, only reverb.
Reverb Time – how long is the full envelope?
Hall – Room – Plate?
Shortcuts to typical effects
Plate is brighter more metallic.
Bandwidth
High and low pass filters are applied.
A little more realistic for recreating live rooms
Room size
Many reverbs have this option!

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• In music, reverb *lengths* are always adjusted to the beat of the song, (bpm) often to quarter note. It will sound right and smooth.

• Delay or pre-delay is calculated based on the size of the room you want to create in sound design for film. If a room is 100' wide and you are in the middle, the sound you make must travel 50' to a wall and then bounce back another 50' for you to hear it. That makes 100' total. That should take approximately 100 milliseconds, or 1/10 second.

But in music, it is best to set reverb time to a division of the bpm (beats per minute – or tempo) so it supports the sensation of tempo. Once the beats per minute are known, charts are available to tell you what the most comfortable delay time would be. Or…

60,000/bpm = Quarter note delay in ms
Divide by 2 for half and full notes.
Multiply by 1.5 for dotted values note+half.

However, **slow songs** will use 1/8 or 1/16 or even 1/32 note reverb so as not to over-reverb it.

In very slow music, you may want to set it at 0 so as not to sound strange.

Note that many digital reverbs have problems sounding good with 0 pre-delay. Can make them metallic sounding. They need a little time.

• If you are using two reverb returns for the same instrument, the closer one is brighter.

• **Short short reverbs** are not “heard” but still add bigness and wideness to a mix. Space and texture.

• Pan the reverb a little to the outside of the instrument. Reverb sounds wrong if panned hard left or hard right.

• If you want the delay to **stand out**, however, try making sure it is **not** tuned to the track. Adjust length and listen for effect.