



School Recording Studio

Beginner Mixing



Introduction

When listening to a final recording you are actually hearing each individual sound layered together and recorded separately on its own individual track. The art of mixing is making them all work together to create that final cohesive mix. The mix can help the composition tell its story better by highlighting the right elements at the right time.

While many aspects of the mixing process can be tedious, it can be just as creative and informed by style as composition or performance. What follows is 1) a basic introduction to the important aspects of mixing that will allow students to begin experimenting and learning the tools and 2) a few adaptable lesson ideas that will hopefully introduce and highlight the more interesting aspects of the mixing process.



Recording Phase

If you have control over the recording phase of a project, it is very important that your raw (unprocessed) audio recordings are of the best quality possible. You want to get as close to the desired sound in this stage as you can. Do not wait to 'fix it in the mix' if you can help it. This will give you the best chance of a great mix. When recording real audio be sure to consider:

- Room acoustics- if recording instruments or the voice through a microphone, reducing unwanted reflections through acoustic treatment (absorption and sound isolation) will make your recording easier to manipulate and fit within the mix.
- Gain staging- make sure your input gain in your DAW while recording averages around -18dB and the peaks do not exceed -10dB. This 'Sweet Spot' is well situated between a signal that is too low and includes too much low level noise and one that is too high and risks clipping and distortion.
- Headphone monitoring volume- if a singer is recording along to a backing track in their headphones and the volume is too loud it can get picked up by the microphone and taint the recording.
- Mic placement- it is also a good idea to experiment with the positioning of the microphone in relation to the sound source to get the best sound. Angle of the mic and placement within the room can have different effects on the quality of the sound.



Understanding Stereo Image

A good mix will give the listener a sense of the music happening in 3 dimensional space when listening to it on a stereo set of speakers or headphones.

A sound can appear to be to coming from your left or right (panning).

It can sound closer to you or farther away (volume).

Or it can sound higher or lower (frequency range).

[This video](#) provides an interesting visual explanation of this aspect of mixing.



Basic Tools- Equalization

Equalization, or **EQ** for short, means boosting or reducing the levels of different frequencies in a signal. You can also think of sounds inhabiting space in the frequency range. EQ is used for two main purposes:

- Making an individual element sound its best
- Making sure each element has space in the frequency spectrum and fits together well with the other elements

The visual output looks like a graph with frequency on the x axis and amplitude (loudness) on the y-axis. EQ allows you to boost or cut the gain at center frequencies along with the a portion of the frequency range around the center frequency (Q or bandwidth) that will also be boosted or cut proportionate to how close it is to the center frequency

[This website](#) gives you a deeper dive into EQ and how to use it.

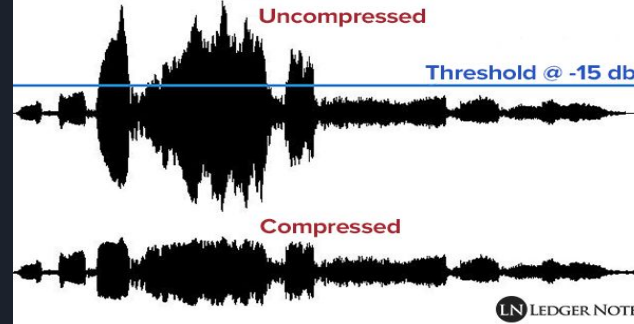


This snapshot of a graphic EQ in Logic Pro shows the EQ curve as well as the resulting sound wave.

Basic Tools- Compression

Compression reduces the dynamic range (difference between the loudest and softest sounds) of sounds by reducing the volume of loud sounds and amplifying quiet sounds. By maintaining better control over the dynamic range of sounds you can boost the overall volume of a track without worrying about the peaks of the music clipping and causing unwanted distortion. Be careful- over-compression of the dynamic range can take the life out of a recording.

The two most basic parameters of a compressor are the threshold and output gain. *Threshold* sets the level for which compression begins. Only signals that go above the threshold will be reduced in volume. *Output gain* can be used to boost the overall volume while the peaks that go above the threshold are compressed.



[This website](#) gives a basic rundown of the parameters of a compressor. [This video](#) is also helpful as well.



Basic Tools- Reverb

Reverb is an effect that emulates the sound of different spaces in the real world. An instrument played in a closet will sound very different from that same instrument played in a gymnasium. The size, shape and type of surfaces in the room affect the sound in many different ways. A reverb will make whatever sound you put through it sound like it is being played in whatever kind of space you would like.

[This website](#) gives brief descriptions of the parameters that can be manipulated in a typical reverb.



Lesson Ideas

The lesson ideas that follow are general approaches to introducing the basic concepts of mixing to students. Each should incorporate an element of listening and analysis of good examples of music they are interested in or a mix created by the teacher along with an opportunity to experiment and create using the concept being learned.

Professional mixing engineers use reference tracks all the time to help their clients convey what they would like to hear from the final mix. Being able to parse out the different elements of a mix and understand how a particular sound was achieved by listening to a finished track is the first step to knowing how to reproduce that aspect for a client or one's own recordings.

Finally, most of what students are going to learn will come through experimentation and play. Hopefully what follows are a few more productive ways for them to get started.



Lesson Idea- Understanding the Stereo Image

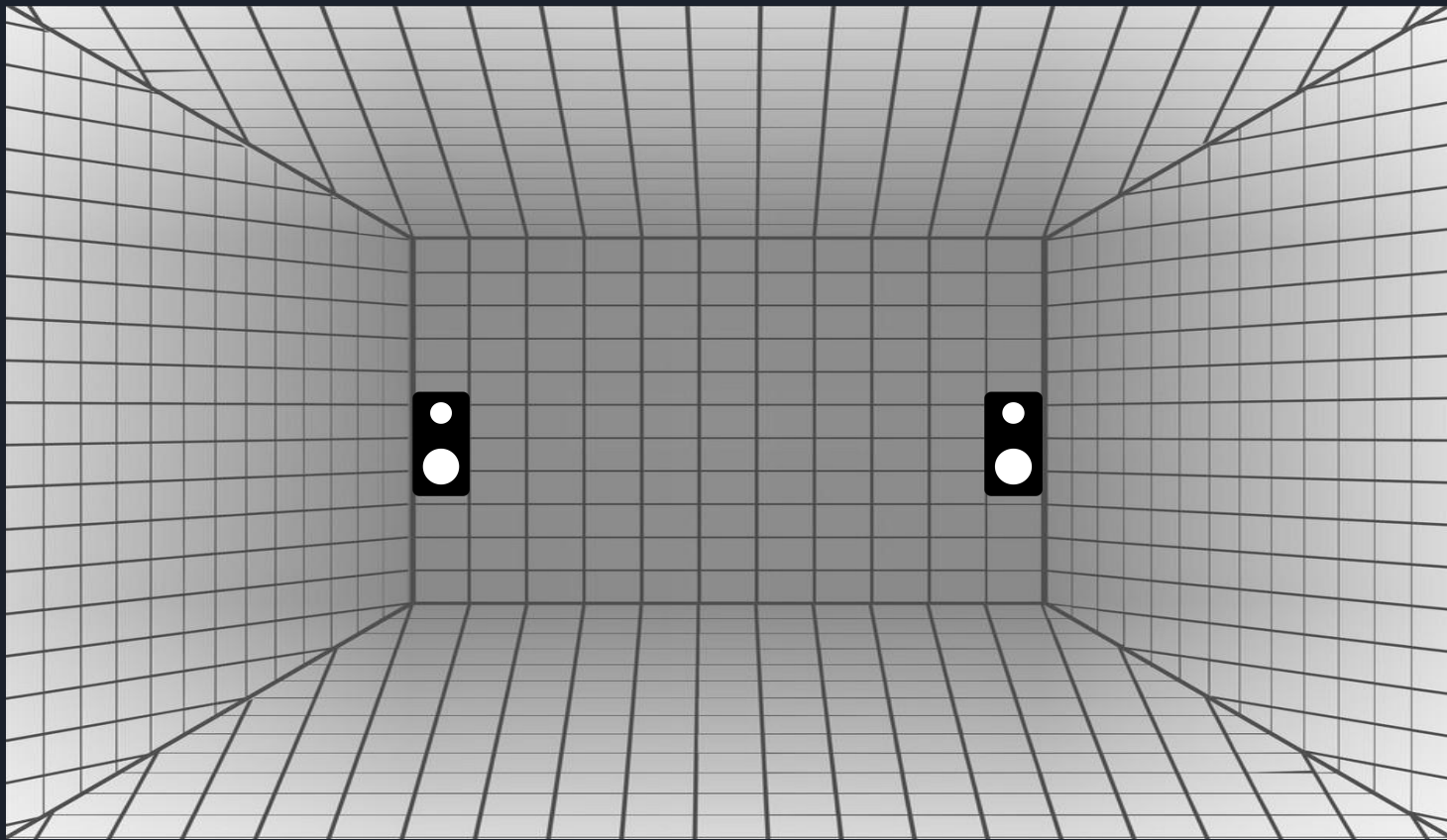
Listening/Analysis

Objective: to be able to map the instruments of a mix within the stereo field

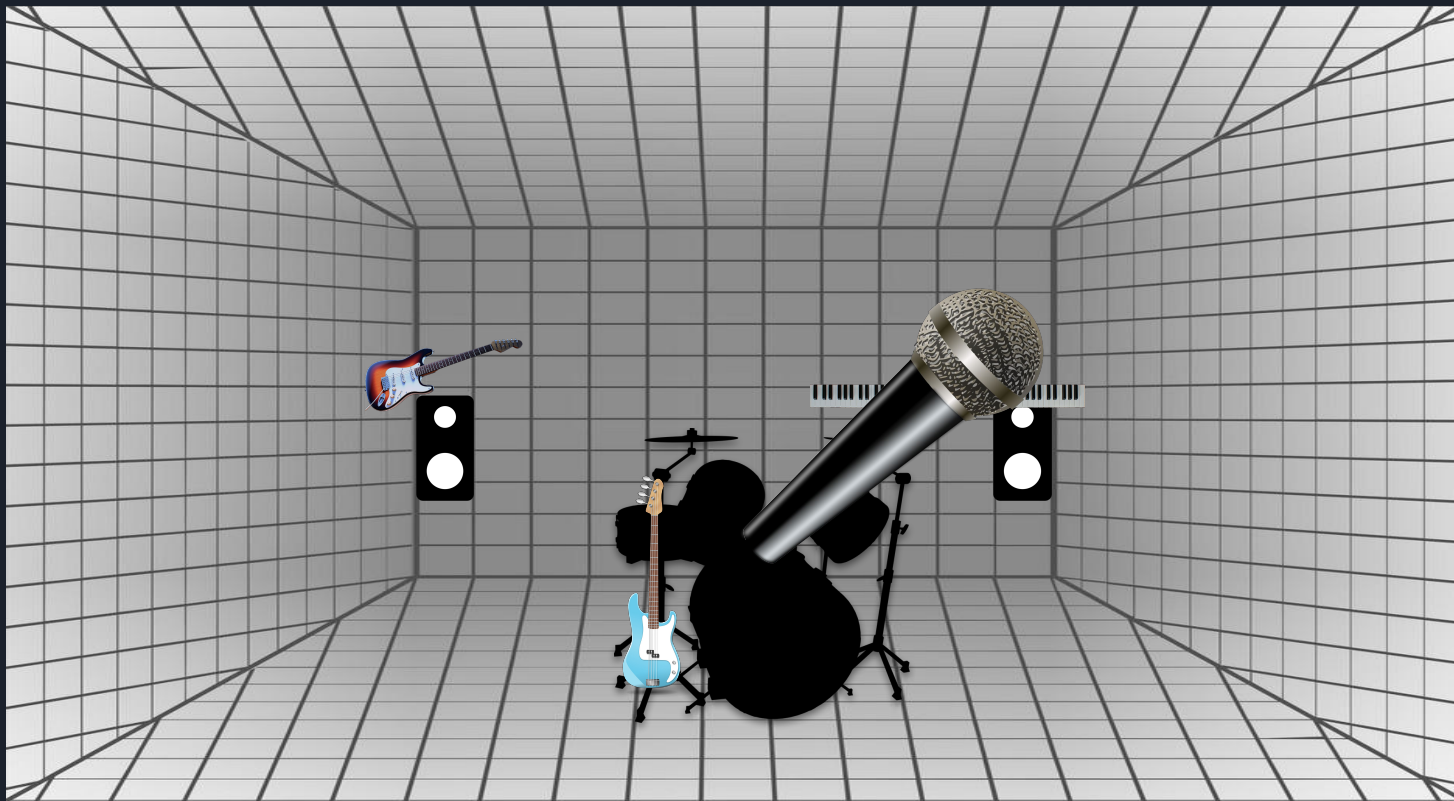
Key Terms: *panning*- whether it sounds like it is coming from the left or right; *volume*- louder sounds appear to come forward in the mix, quieter sounds appear to be farther away; *frequency range*- similar to the way that we perceive pitch as being high or low.

Materials: 1) An audio file of a stereo mix of a song, preferably one with a more limited track count. 2) Audio player 3) headphones 4) worksheet showing a graphic representation of the 3D stereo field

Student Process: 1) Write down all the instruments you hear. 2) For each instrument, do you hear it more in your left ear, right ear or both equally (panning position)? 3) How prominent is it in relation to other instruments (perceived volume)? 3) Is it a high, medium or low pitched sound (frequency range)? 4) Draw or write each instrument on the graph according to these 3 aspects.



A visual representation of the stereo field. Students can plot each instrument in the stereo field based on panning (left to right), volume (up front or farther back), frequency range (high or low).



Example of instruments plotted in the stereo field of a mix. As you can see the vocals are up front (more present volume), panned close to the center and take up the mid frequency range. Drums and bass are in the center, farther back and in the low frequency range. While the guitar and keyboard are panned hard left and right and take up the upper frequency range.



Lesson Idea- Understanding the Stereo Image (continued)

Experimentation

Objective: to discover the ways in which panning and volume can change a mix

Materials: 1) Separated mono audio file stems of a song (can be pre created by the teacher or students can make recordings of their own) 2) computer with a DAW 3) headphones

Student Process: After each step take detailed observations of what you hear and how the overall mix has changed. 1) Import stems into separate audio tracks in your DAW with faders at equal levels and panning in the center 2) try to emulate the volume and panning of the previously analyzed song 3) reverse the positioning of each instrument 4) try several alternative positionings of your own



Simple Mixing Steps

There are many ways to approach mixing that eventually come down to experience and preference. Using the tracks from the previous exercise or another track, students can begin experimenting with more of the mixing process. Here is a simplified beginning process that students can follow to begin experimenting.

1. Adjust volume levels and panning for each track.
2. Place an EQ on each track. Experiment with frequency sweeps to find frequencies you might want to boost or cut.
3. Listen for tracks with particularly large dynamic range and add compression where necessary.
4. Experiment with reverb on vocals or lightly on the overall track to give it a sense of space.



Other Lesson Notes

- Demonstrate how to dial up the different effects presets that can be found especially in Logic and encourage them to explore them on their own. Make sure to toggle on and off the enable switch for each effect so that they can hear how they effect the sound. Do that for each effect with the rest of the effects on and off and with the individual tracks soloed and then in the context of the full mix. Discuss or have them right down their observations. This will also allow them to make observations about typical effects chains for different kinds of instruments.
- For teaching EQ you can load a parametric EQ into a channel strip and show them how to do frequency sweeps in order to highlight how each sound encompasses a range of frequencies and each part of the sound provides a different aspect of the sound's character. Also the ways that EQ can be used to filter out sections of the frequency ranges is useful like rolling off all the sub frequencies in the vocals or creating a telephone effect.