PAT 200/500
Recording and Mixing PART 4:
Equalizing (EQ)

EQ

In this segment we will explore the use of the equalizer to solve balance issues in the mix in the frequency domain. We will use EQ to remove **frequency masking** to create more space in the mix for each instrument, in turn this should improve our level balance.

Frequency masking is an auditory phenomenon that occurs when two similar sounds play at the same time, or in the same general location. One masks the other, confusing your perception of either sound.

We will focus on entirely **REMOVING or partially REDUCING the volume of specific frequencies that are causing frequency masking** and favor using broader EQ adjustments rather than narrow bandwidths.

When working on this assignment it is important to listen to how each instrument and the EQ adjustments are **affecting the other instruments** in the mix. Frequent **muting** of tracks as well as **bypassing** of the EQ plugins is extremely important to keep your ears fresh.

While our main task in this assignment is to **fix frequency masking** issues and add some gentle enhancements to the instruments, you may also want to explore more drastic tonal sculpting.

If you do decide to drastically modify an instrument's tone, I would suggest putting the EQ **BEFORE** the compressor (if one was used), sculpt your tone, rebuild the level balance with the new tone, then revisit your compression settings. If you feel that the dynamics of a track are under control, then you will probably want to EQ **AFTER** your compressor.

If you are unsatisfied with the dynamics - or perhaps problematic frequencies are causing the compressor to overwork - you may want to put your EQ plugin **BEFORE** your compressor in the signal chain; after EQing you may need to adjust your threshold and make-up gain to compensate.

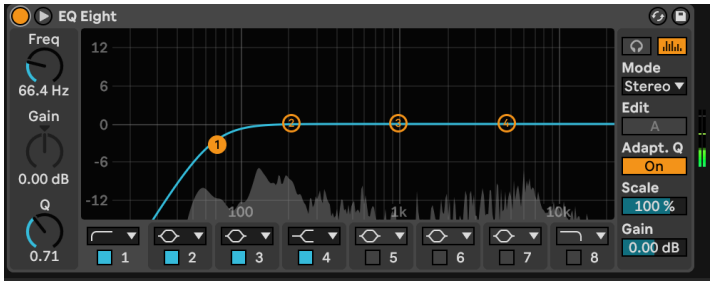
1. Please load your completed PART 3 assignment. Continue from your Ableton session to complete this assignment.

2. First go to the file menu and "Save as" to create a new project file for "PART 4."

3. We will begin our exploration of EQ by revisiting our High-Pass Filter settings that we applied during our level balance assignment (using Ableton's EQ8). In our level balance, we were adjusting the **Frequency** setting just until the point where we started to notice a change in the timbre. This time we will see if we can create more clarity and punch in the low end of our mix.

4. Just like before, we will make our EQ adjustments in order of importance. We can add instruments in one at a time and build the mix up while making EQ adjustments. For instance, begin by soloing the bass drum and then solo the snare (command clicking the solo button allows you to add instruments to the solo). Try **toggling the snare drum solo on and off** a few times while focusing your attention on the sound of the bass drum. How does the sound of the bass drum change? Does it become less present? Lose punch?

5. With both the bass drum and the snare soloed, **try adjusting the frequency of the HPF (high-pass filter) on the snare drum track to see if raising it improves the sound of the bass drum.** Use the EQ **bypass** button often, this will allow you quickly hear how your EQ settings are affecting your mix!



6. Now let's add the drum overheads to the soloed instruments and experiment with the HPF setting. Because the drum overheads are quite distant from the location of the bass drum, they can sometimes make the bass drum sound more distant in the mix. By EQing some of the low end out of the overheads, it can really help to make the bass drum come forward and punch through the mix!

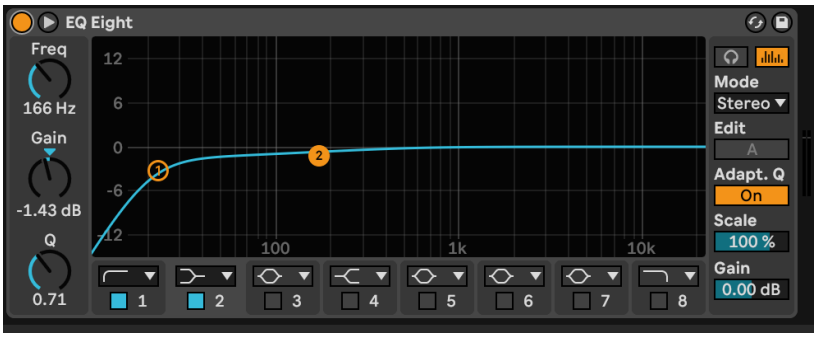
   However, since there are no close mics on the toms, be careful not to take too much low end out - the toms may sound too thin! Use the **bypass** button to check your settings!

REMEMBER!: When adjusting an EQ that is placed **BEFORE** a compressor, you will most likely need to revisit your compression settings - especially the **Threshold** setting since you have reduced some of the level that is entering your compressor. You may also find that you need to fine tune your level balance - so don't be afraid to adjust your faders as you work!

7. Now let's add the bass guitar to the soloed instruments. Try bringing the bass guitar in an out of the mix a few times and **see if you lose any clarity in the drums**. You may find that the bass drum and the bass guitar are fighting for low end space. **Try adjusting your HPF setting on the bass guitar to see if you can create more space for the bass drum.**

NOTE: If you find the HPF to be too extreme of a filter, you might decide to switch to a **low shelf** which would have a more gentle attenuation of the low end frequencies. This might be a better choice for the bass guitar as you can **preserve more of the bottom end while creating a bit more space** in the mix by reducing masking.

In the right-hand image, I am using my original HPF setting on the bass guitar and I've added a low shelf filter to attenuate some of the low end to reduce masking of the drum set bottom-end as well as to balance out the tone of the bass guitar which I felt was a little too boomy.



8. Continue this process by adding instruments into the soloed selection, first listening to how they affect the overall balance and clarity of the mix and then deciding if any adjustments should be made to the HPF/low end filtering.

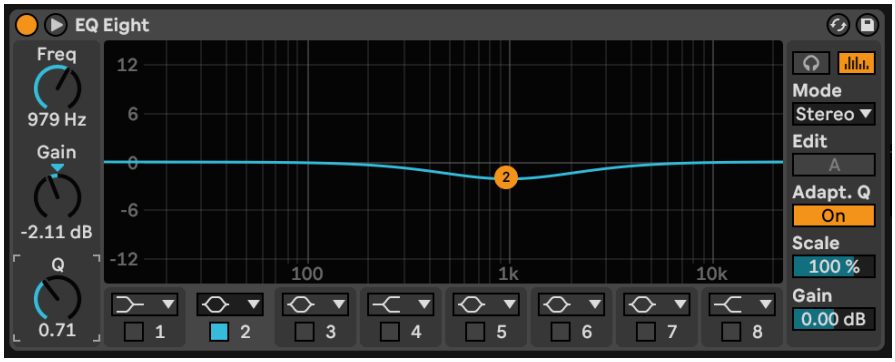
   Avoid the temptation to make your EQ adjustments in solo! You will get better results if you EQ while listening to the rest of the instruments in your mix. When soloed, an instrument might end up sounding very strange and even "**bad**" however your EQ setting might be perfect for the mix - **a listener is never going to hear the instrument soloed!**

9. With some instruments, you might find that there are bands of frequencies, besides the low end, that are creating **frequency masking** issues. In this case, you may want to add a second EQ plugin after your compressor. If you don't have a compressor on a particular track, it would be fine to make the adjustments in the same EQ8!

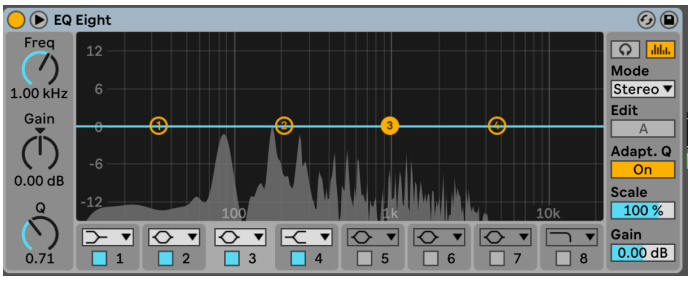
10. For instance, If you notice that there are some **mid-range frequencies** in one of the guitar parts that is **getting in the way of the lead vocal,** you could try using a **peaking filter (parametric)** to reduce masking in this area.

    It may be helpful to **first BOOST the gain and then sweep the center frequency** to notice which frequencies seem to cause the greatest issue and **then pull down the gain knob to cut at this point**.

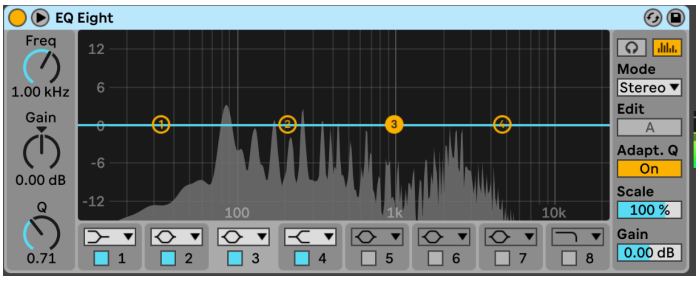
    NOTE: Boosting and sweeping can be deceptive! It can cause just about any frequency range to sound "bad" if you boost too much - so be careful not to overdo it! Lower **Q** settings also tend to be more natural sounding than narrow bandwidths!



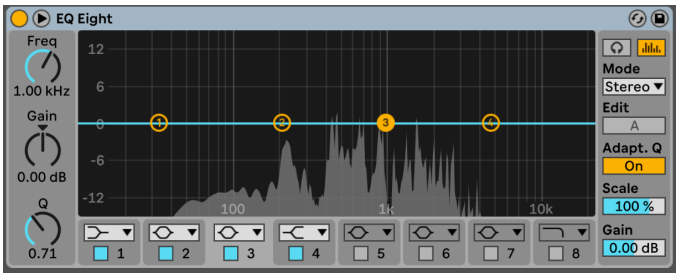
*In the image above, I've applied a gentle cut to the midrange of an electric guitar to **carve out a bit more sonic space for the lead vocal.***



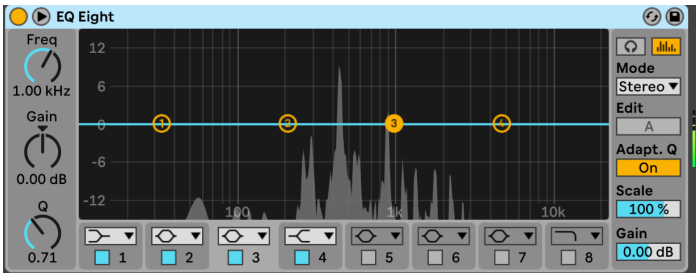
Acoustic Guitar



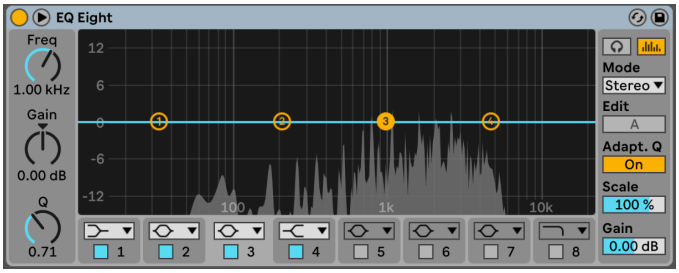
Electric Clean Guitar



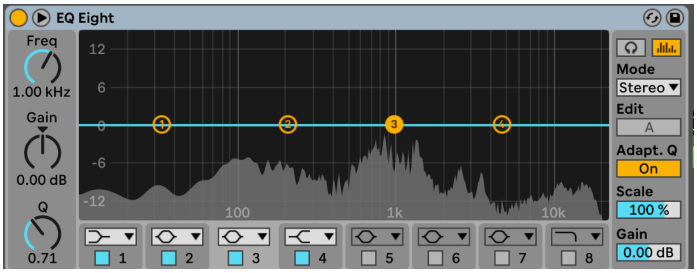
Electric Guitar dist.



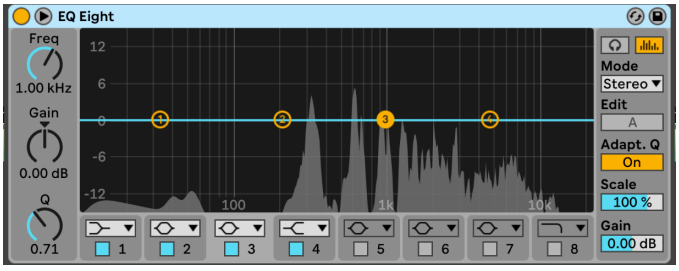
Electric Guitar swell dist.



Electric Guitar end dist.



Vox lead



Vox 2

REMEMBER: The EQ8 gives you a visual representation of the track's **frequency spectrum.** Above are snapshots of the frequency spectrum on the guitars and lead vocal tracks. These visualizations can help your ears determine where **frequency masking** may be occurring. If you hear one of the guitars getting in the way of the vocal, you may be able see it here. While visuals can be a helpful guide, EQ decisions should ultimately be based on your ears.

TONE

11. You can also use **EQ** to modify the **tone** of an instrument and to **move tracks forward or back in the mix** by making them brighter or darker respectively. Also remember, that cutting low end can make an instrument sound brighter and cutting top end can make it sound darker or more bass heavy!

    Cuts can be advantageous since they don't rob you of **headroom** and they also tend to hide the phase shifts that occur when using an EQ. That said, don't be afraid to experiment with boosts!

12. For instance, once all of the instruments are in the mix, you might find that the bass drum isn't quite cutting through the mix. You might try a bit of a boost around 1.5kHz using a **peak filter** to help the attack of the beater punch through. This can also help the bass drum be heard when a mix is listened to on smaller speakers, like those found in a laptop.

13. Perhaps a gentle boost around 10 kHz, using a **high shelf filter,** on the acoustic guitar might bring some excitement and air to the mix!

14. While the focus of this assignment is mainly to solve frequency balance issues, be sure to also spend some time experimenting. ***TIP****: If tone shaping is what you're after it may be best to do this before refining level balance and compression settings.*

Now that you have explored EQ, please "**bounce**" your mix down to a stereo wav file to submit. Use the Ableton file menu to "Export Audio/ Video" to create a 44100Khz, 24 bit bounce, using the same settings as PART 3.

Please name your bounced file "yourname_PART4."

Before submitting, LISTEN through your ENTIRE BOUNCE file to check for any problems!

UPLOAD your wav file to the Dropbox link on the assignment page.