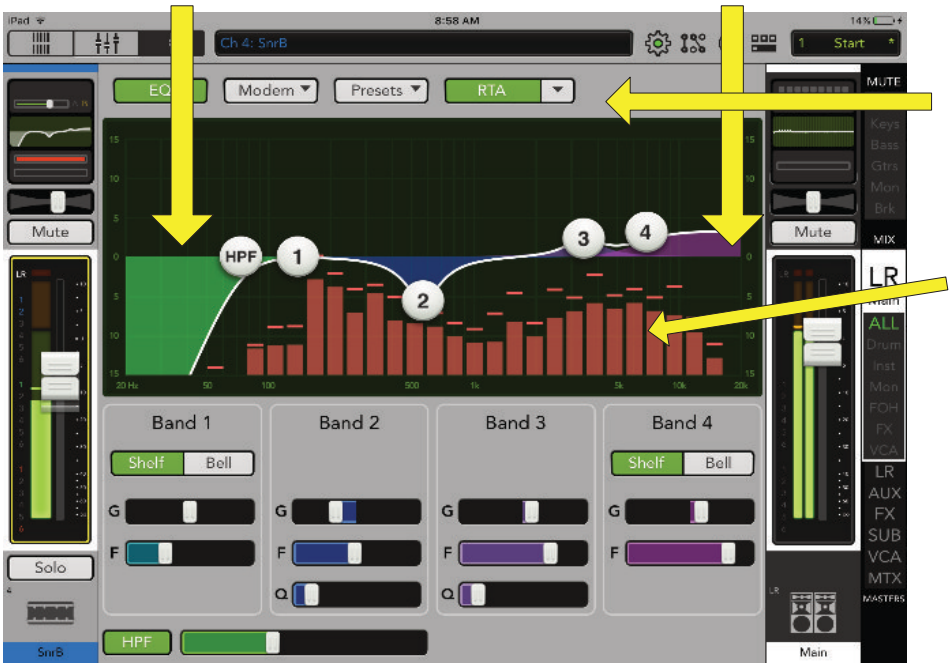
LIVE **SOUND**

EQ COMPRESSION NOISE GATE REVERB

EQ changes the character of the sound by boosting and cutting the frequencies of the sound. At its easiest, think about the 'bass' (the low frequencies) and 'treble' (high frequencies). The frequencies have numbers from 20Hz (low) to 20kHz (high).

Down here is the 'low' (bass) - and up here is the 'high' (treble)



TIPS

Click the 'RTA' to see what the sound looks like when the band play (shown by the red lines). This helps you know where to adjust the sound.

EQ is sparingly used to mainly cut and not boost. But Master Fader often needs more dramatic boosts and cuts so be flexible!

EQ is about hearing all the band, especially the vocals. We could turn up the volume to hear sounds more - or we can use EQ by boosting (drag EQ above the '0 line') or cut (drag below the '0' line). **Make sure the EQ button (top left) is green (switches it on)**

The HPF ('high pass filter') cuts the low (bass) frequencies below the setting you use (so 40Hz - 70Hz in the image above). Use HPF on everything (click 'HPF' to turn on).

HPF Settings - For vocals, electric, acoustic, violin set the HPF to 100Hz (or 120Hz if there's lots of 'pops' on the P's and B's on vocals). Snares, toms, hi-hats set to 80Hz. For bass guitar / kick drum, set the HPF around 20-25Hz.

Bands - adjusts where the EQ does its thing! In the image we see controls for 'shelf' which means it cuts all the low sounds below, or all high sounds above your setting. Or a 'bell' which works at a set frequency and then a bit of the frequencies around it. With bassy instruments (kick drum / bass guitar etc you can use a shelf cut above 10kHz).

'Q' button - makes the bell 'shape' very tight or very wide. Usually, we keep things as narrow as possible so we don't cut lots of the frequencies and leave an empty sound!

'Sweeping the EQ' - we can use EQ to get rid of 'muffled' frequencies. First, set the 'Q' button fairly 'tight' on a band, then 'pull up' the band to boost it. Now move the band left and right with your finger from around 180Hz to around 800Hz until you find a 'muffled' or 'nasty' frequency. Then cut it. It's usually from 180Hz-500Hz. You can also use EQ to separate instruments (e.g. electric / keys). Where you boost one, cut the other to create 'space' for each. Where vocals have too much 'ssssss' then cut around 4-8kHz.

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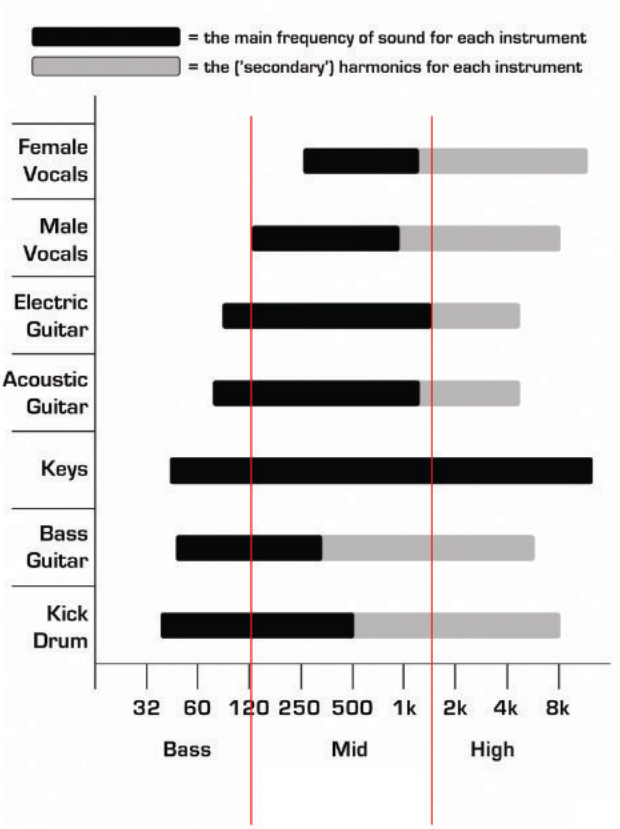


LIVE SOUND GRAPHIC EQ TIPS

Cutting at 150Hz-300Hz (or up to 800HZ) may cut out muddiness from a mix. To give the mix more sparkle, boost at around 6kHz, 8kHz or 10kHz. Some pop producers give songs a big cut in EQ around 400Hz-4kHz. You can cut around here and increase around 4-8KHz to sometimes increase what's called the 'perceived loudness' of a track.

Cut all the EQ on tracks below 25Hz to eliminate these deep sounds you can't hear. This can act as a boost to bass. You can use a high pass filter to do this. This is essential on professional recordings.

Equally you can cut the higher frequencies on bassier instruments so they don't take up 'space' in the mix - allowing more 'space' for instruments operating at those frequencies!

A kick drum 'punch' is around the 60-100Hz range. Cut between 200 to 2000 Hz if you find it's a bit muddy. Snare drums have their depth around 150-400Hz with the 400-800 MHz range where you find the muddiness. With both snare and kick, around 2000 - 5000 is where you find the 'thwack' sound. Cut toms in and around 100 to 300 Hz if they're too boomy.

Bass guitars and kick drums often share the same 'EQ' space, so find the sweet spots of each and then do a boost of EQ on one and a cut of EQ on the other in the same frequency (e.g. 100 Hz). The fundamentals and bass of bass guitar are around 50-180Hz. Around 180 - 300 Hz you can cut a bass if too boomy.

Acoustic guitars can be cut (when playing with a full band) in the 100-200Hz area and below as they can muddy the mix. The 200-400 Hz range can generally be left with some small boosts in the 2000 Hz / 7000 Hz to add some sparkle.

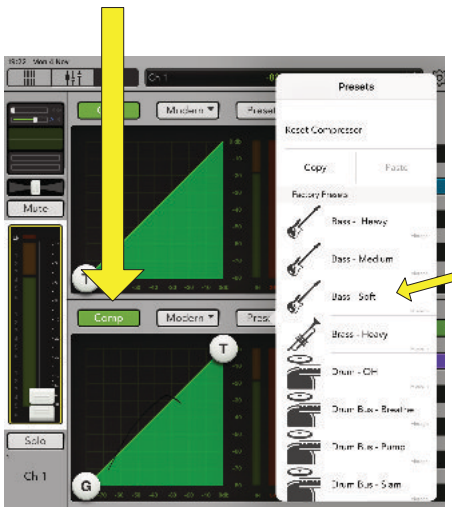
Electric guitars can often be left pretty flat when doing the EQ. All the lower end (sub frequencies) can be cut completely with a high pass filter. The main part of an electric lives from 150 Hz to 1000Hz. The 1000 - 2000 Hz area can be cut a bit with some 'air' added at the high end of the EQ if wanted.

Pianos / organs / synths have varied EQ. In worship these are often played with one instrument, so get your keyboard player to play back all the sounds they are likely to use. Make sure that any bassy sounds (often found on organs or even pads) don't clash with the bass, so you may need to cut anywhere from the 80 to 500 Hz frequency.

In terms of vocal EQ, you can cut everything below at least 100 Hz. You may also need some cuts up to 500 Hz on a speaking mic as this is where the 'pops' are often found. Around 1000 Hz is where you may need to boost to get the singer to 'stand out' or around 3000 Hz to add presence. To help reduce sibilance (the 'ssss' sound on vocals), cut around 4-8Hz, depending on the singer's or speaker's voice.

These are tips and clues about EQ but it's not strict and you may have other ideas that work well. Basically you want a good sound to hear everyone in the band. You may also need to use EQ creatively - so if there's no bass guitar, have more bass in the keys.

COMPRESSION is a bit complex but it's about making quiet bits louder and loud bits quieter so the sound is more consistent!



We don't automatically use compression as it can interfere with the 'dynamics' (the 'flavours' if you like) of the sound. But it can be useful sometimes.
On Master Fader, there are 'presets' you can click on when you want to use compression. Simply use the ones relating to the what you want to compress (e.g. for a bass guitar you may use 'bass - soft').

We ***may*** use compression on a vocalist who is very loud and sometimes very quiet. This helps the volume be more consistent.

We ***may*** also use compression on the bass guitar or the kick drum, snare and tom drums. This can help them be more consistent and have more 'punch'.

But we don't need or always use compression.

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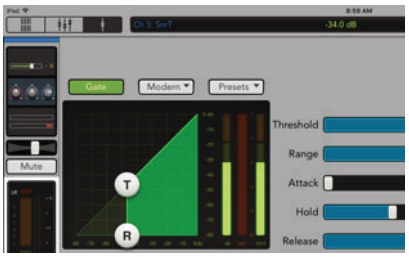
A Gate (or Noise Gate) is where we cut off very quiet sounds (so for example it can cut off the sound a vocalist makes when they take a breath) but it's regularly used for getting rid of nasty hums, buzzes and stopping feedback.

On the left we can see that the 'Gate' is in the shape of a triangle. In this example, the gate is not on and therefore won't cut out any of the quieter sounds or buzzes.

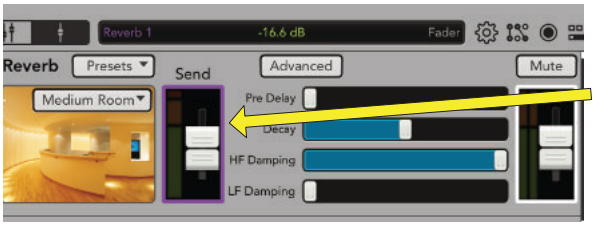
There is a scale along the bottom from -80db - 0db. This represents volume (db stands for 'decibels').



In this example the gate has been switched on and has been set around -50db, so sounds quieter than -50db will be cut off. This is too extreme. If we use a gate (e.g. to stop buzz on a bass guitar or to stop loud squeals called 'feedback'), set the cut off to -70db by using the threshold and range controls. Keep the release 'long'. We may use a gate on some drums if we get feedback between two drums or if a 'low tom' starts 'rumbling'!

Reverb is a 'reflection' of the sounds we hear. Imagine speaking in a small room and then speaking in a Cathedral. In a small room there isn't much 'reflection' but in a a Cathedral there's loads of 'reflection' so the sound echoes around. **This is reverb.**

The main places we tend to use reverb in live sound are on vocals. When we add some reverb to vocals we give them more 'depth' and 'character' (like being in a cathedral). Without reverb they can sound a bit 'wooden' (like in a small room where the sound seems to 'stop dead'). But we don't use so much reverb that we can't hear what the person is saying and lose clarity!



On Master Fader, reverb is found on individual channels (sets the type and amount of reverb)

The reverb 'master' is on the mixer view

What, when, where - Use the 'medium room' setting and to start, have the faders up as in the images above. Generally, use reverb only on vocals (or you can use reverb on acoustic guitar / drums / cajon etc if you're not in a 'reverby' kind of room!)

How? Add a small amount of reverb to the worship leader. Add more reverb to the backing vocalists (BVs). **Why?** If you think of a camera, adding a bit of reverb means the worship leader is more 'in focus' (we call this being in the 'front' of the mix) and adding more reverb to the BVs means they are less 'in focus' (further 'back' in the mix).