# The Ultimate EQ Cheat Sheet

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# What is EQ

Don’t worry, I’m not going to get all Mr. Science on you here; I’ll keep this brief. If you want to just skip to the visual EQ cheat sheets I’ve created to teach you how to perfectly EQ every instrument in your mix, refer to the table of contents above to skip to where you’d like.

Before I get into that section, I just want to talk quickly about EQ, what it is, what it does, and the different types of EQ plugins for some practical context on the cheat sheets themselves.

All audio is made up of vibrations at different frequencies, some of which we can hear, some of which we can’t.

Fun Fact: The average human can hear frequencies between 20Hz to 20,000Hz.

Equalization (or EQ for short) allows us to change the makeup of a piece of audio by boosting, cutting, and essentially favoring certain frequencies over others.

In the context of audio mixing, most of us are working “in the box”, meaning entirely on our computers using a digital audio workstation (DAW).

Ableton Live, Pro Tools, and Logic Pro are all popular examples of DAWs we use to mix audio.

I’m going to assume you know all about and use a DAW by now, and are well familiar with plugins (duh… that’s why you’re reading this).

There are hundreds if not thousands of EQ plugins which are designed to split your audio into various frequency ranges/bands which you can add or subtract from to sculpt the audio of the tracks in your mix as you see fit.

# Types of EQ

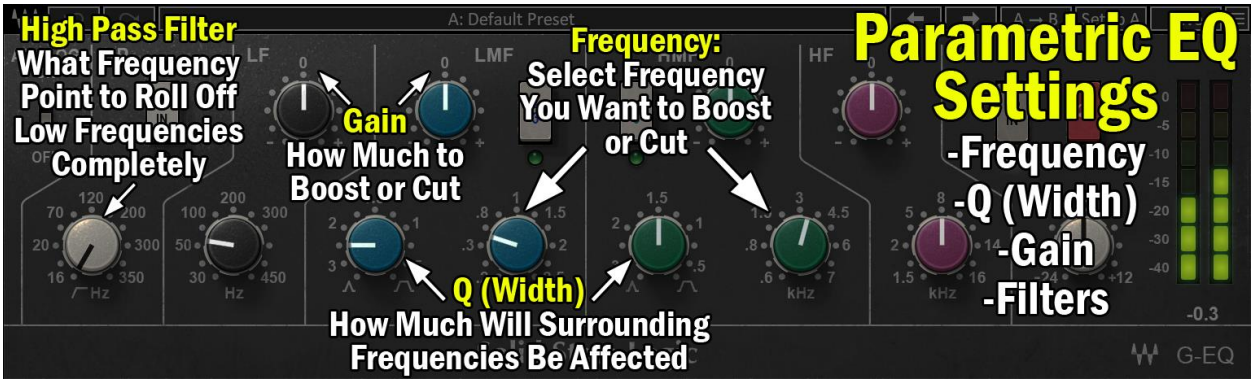
Not every EQ is built the same.

There are a few different types of EQ which you should be aware of. While many of them fall into the same overall category or categories, it's still worth being aware of what they are and the differences between them.

# Parametric EQ

Parametric EQs generally refers to an EQ with more settings than its peers, and particular settings at that.

Speaking of settings, let's take a quick look at the most common settings associated with EQs, all of which you'll find on parametric EQs.



**Frequency:** Unsurprisingly, the “Frequency” setting on a Parametric EQ dictates which frequency will be most affected by the subsequent settings.

**Q (Bandwidth):** The “Q” on an EQ is the most enigmatic setting. After you’ve set the frequency, you’ve essentially created a band at that frequency.

The Q value determines the width of that band, meaning how much of the surrounding frequencies will be affected by the next setting we’ll talk about in a second, “Gain”.

It’s a bit counter-intuitive, but a lower Q value means a wider band (like a gentle slope), meaning more frequencies around the frequency you set for that band will be affected.

Conversely, the higher the Q value, the more narrow that band becomes (like a mountain peak), and the less the closest surrounding frequencies to your set frequency will be affected.

A higher Q value/narrower bandwidth allows for more surgical adjustments on a smaller frequency range.

Lower Q values/wider bandwidths sound more natural as you get a gentler slope as the “boost” or “cut” you make gradually rolls off on surrounding frequencies less abruptly.

Note that some EQs have an additional setting to slightly change the shape of the Q/curve: dB/oct. This essentially refers to what rate the decibels drop per octave.

For instance, 6dB/oct makes a gentle curve, whereas 96dB/oct as a much starker drop.

Similar to a lower Q, a lower dB/oct sounds more natural as it produces a gentler drop back to a flat response.

**Gain:** The gain determines how much you’re adding to or removing from that frequency range.

Adding gain is typically referred to as “boosting” that range. Subtracting gain is called “cutting” that range.

It’s typically preferred to cut what you don’t want to consequently preserve/enhance what you do want.

This is referred to as “Subtractive EQ”, and it works off the “less is more” rationale.

That said, there is no rule against boosting a frequency range.

As always, the only rule is whatever sounds best… is best.

Trust your ears.

**Filter:** Most parametric EQs feature filters in some capacity. Note that this is a term with multiple definitions, and this applies to EQs.

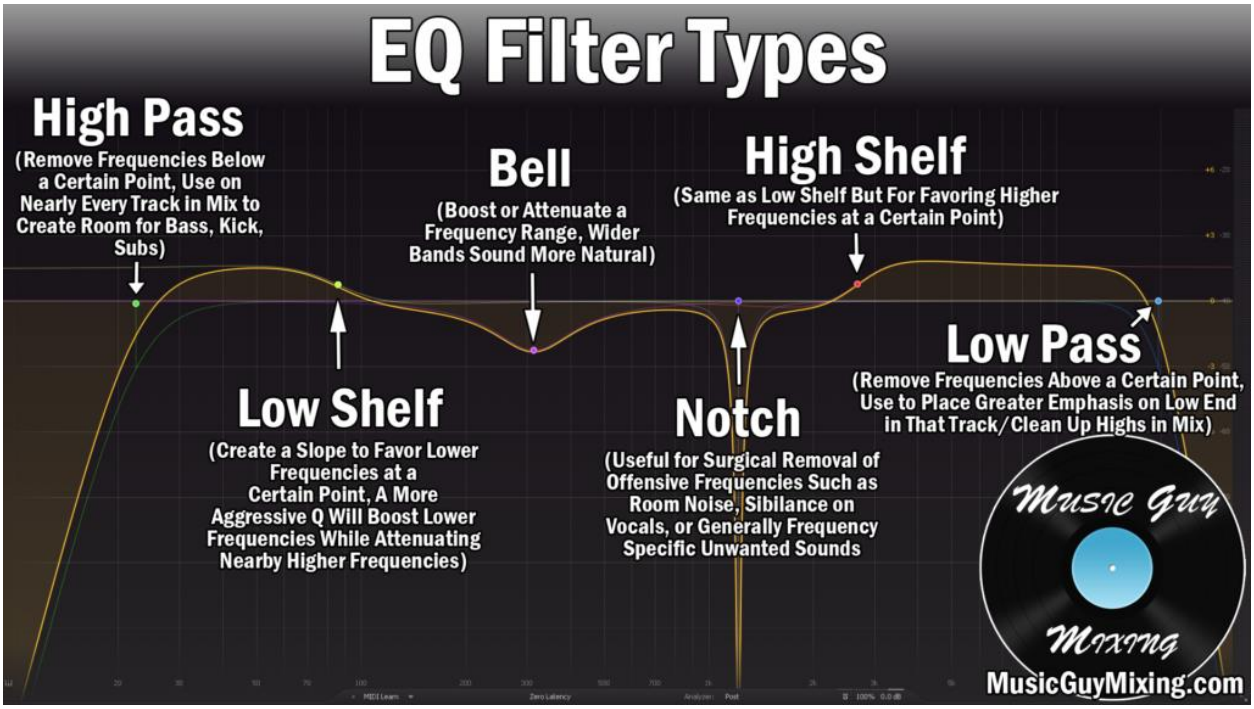
Oftentimes it refers to high or low pass filters, which work to remove all frequencies above or below (respectively) the frequency point you set.

For instance, setting a high pass filter at 100Hz means it will filter out everything BELOW 100Hz, allowing everything higher to pass (hence the name).

Conversely, setting a low pass filter at 10,000Hz (10k) will cut out everything ABOVE 10k and allow everything lower than that to pass through and be heard.

There are different types of EQ filters or different EQ shapes essentially.

# EQ Filter Types




**High Pass:** As I just mentioned, a high pass filter removes the frequencies BELOW a certain point, allowing higher frequencies to pass through. As mentioned, the degree of the steepness of the filter is typically set by decibels per octave. For instance, 6dB/octave is a gentler roll off whereas 96dB/octave is practically a 90 degree cliff drop off.

*****Pro Tip*****

Start your EQing of every single track in your mix with a high pass filter. Adjust the frequency of the filter until

you hear the audio begin to sound thinner, then back off a bit until you don't notice a difference.

Even if there is inaudible noise, virtually every track has audio information at low frequencies.

Leaving it on one track is fine, but add this up over the dozens of tracks in your mix and it begins to make things sound muddy, not to mention it takes up headroom which could be used to make your mix competitively louder.

I'll get into specific frequency points which you'll want to high pass for each instrument later in the cheat sheet.

**Low Shelf:** A low shelf creates a slope which favors the lower frequencies below a certain set frequency. A lower Q creates a gentle slope up to favor the lower frequencies to the split. A higher Q creates a starker contrast and faster jump to the lower frequencies.

**Bell:** The most common EQ shape, a bell allows you to cut or boost in a bell shaped pattern at the frequency of your choosing. As previously mentioned, the Q determines the width of the band, or how much of the neighbor frequencies are affected.

**Notch:** A “notch” is a type of deep cut in which the frequency is removed entirely. With a high Q, the notch is ideal for surgically eradicating a frequency of your choosing.

**High Shelf:** A high shelf is the opposite of the low shelf, meaning it boosts up frequencies above the frequency of your choosing.

**Low Pass:** A low pass is the opposite of a high pass, meaning it allows lower frequencies to pass while rolling off frequencies above the set frequency.

Getting back to Parametric EQs, those are the normal settings you’ll find on one (Frequency, Q, Gain, Filters and or EQ type).

# The Best EQ Plugin

My favorite EQ, parametric or otherwise, is the FabFilter Pro-Q. It's arguably my favorite plugin of any type PERIOD, that's how useful it is.

It's the only plugin on every single track on every mix I do for good reason. Here's a snapshot of what it looks like:


It's the most versatile, offers several features all-in-one which other EQs are completely dedicated to, and its

visual user interface is easy to understand, use, and dial in the sound you want quickly.

Drop it on your track and double click at any frequency and it creates an EQ band for you to adjust at will.

Do this on most of the frequency spectrum and it creates a bell shape.

Double clicking at the left or right ends of the frequency spectrum and the plugin intuitively creates a high or low pass filter.

It's one of the few plugins which I did a review for and recommend everyone own if they're doing mixing given how useful it is.

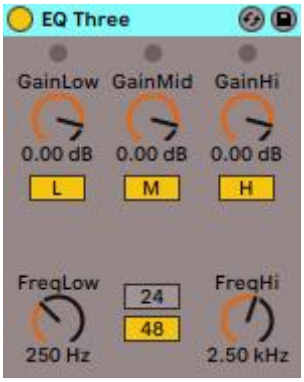
Anyway, that's my pitch. Note that all of the cheat sheet graphics I made for each instrument in this guide I made using the FabFilter Pro-Q.

# Semi Parametric EQ

Next, we have semi parametric EQs, which are very similar to parametric EQs, they just don't give you the same level of control.

Typically the settings or "parameters" missing from a semi parametric EQ are the abilities to adjust the Q/bandwidth or even set specific frequencies.

For instance, the very basic 3-band EQ which comes stock with my DAW, Ableton Live, has three gain knobs: one for cutting or boosting the lows, one for the mids, one for the highs.



It also allows you to set the cutoff point between the low and mid and mid to high, thus dictating which frequencies each band occupies.

You'd think that's as basic as you can get in terms of features… but wait!

# Graphic EQ

If you grew up in or before the 90's, you might recognize a graphic EQ from stereos of the past.

A graphic EQ features static frequency positions and a slider for each:


That plugin pictured is the Waves GEQ – a 30 band graphic EQ.

Most graphic EQs average around 12 sliders, but the GEQ features 30 to give you more options to make more precise adjustments in your audio.

As you probably guessed, you simply move the slider up or down if you want more or less of that frequency.

Even with the extra bands, the lack of choosing your own specific frequency makes graphic EQs less practical for audio mixing.

They're useful in live sound, and there are even some studio mixing engineers who swear by them, but I prefer having more control when I reach for an EQ.

Now let's talk about a few more, let's call them settings, which some EQs are specifically made for, but are included with the FabFilter Pro-Q.

These settings give you more control over your track's frequencies. Settings like:

# Dynamic EQ

Dynamic EQ is a specific type of EQ which allows you to raise or lower a band on a track at different rates throughout the mix.

Why would you want to regulate the amount of boost or cut you do on a frequency band during a track?

Sometimes you have a frequency which is only a problem sometimes. In some cases, a static/conventional cut here is fine.

In other cases, that frequency might be important to the track, so a static cut would take away from that track in more ways than one.

With a dynamic EQ, we can just cut when we get a build up at that frequency, preserving the overall tone of that track.

It's similar to a multiband compressor, but there are some differences. Typically when you want to go for more surgical fixes, dynamic EQ is the way to go. When you want to affect a bus or entire mix on a macro level (ideally with subtlety), a multiband compressor works well.

In Pro-Q, you simply right click a frequency point and select the option to make it dynamic. Then set your threshold and dynamic range of how much reduction or boosting you want to get it working how you want it.

# Mid Side EQ

Mid side EQ refers to applying EQ moves individually to the center or sides of a stereo track or mix.

This is useful in the mastering process or with any track where the stereo information is baked in.

A common use for mid side EQ in the mastering process is to high pass the low frequencies exclusively on the sides when there's a buildup.

This shifts the low frequency focus to the middle where it should be and creates clarity on the sides and on the master in general.

Right clicking on any frequency point in Pro-Q also gives you the option to make a band affect the mid, sides, or even left or right channels only.

# Linear Phase EQ

Linear phase EQ is a feature of some EQs which work to fix phasing issues which EQ can introduce to audio.

Whenever we single out a band to boost or cut a frequency, it changes the timing of those frequencies ever so slightly.

This delay creates a phase issue which manifests in a slight smearing effect on your transients and a coloring of the sound of the audio.

To compensate for this, linear phase EQs work to adjust the audio back into phase, removing this issue.

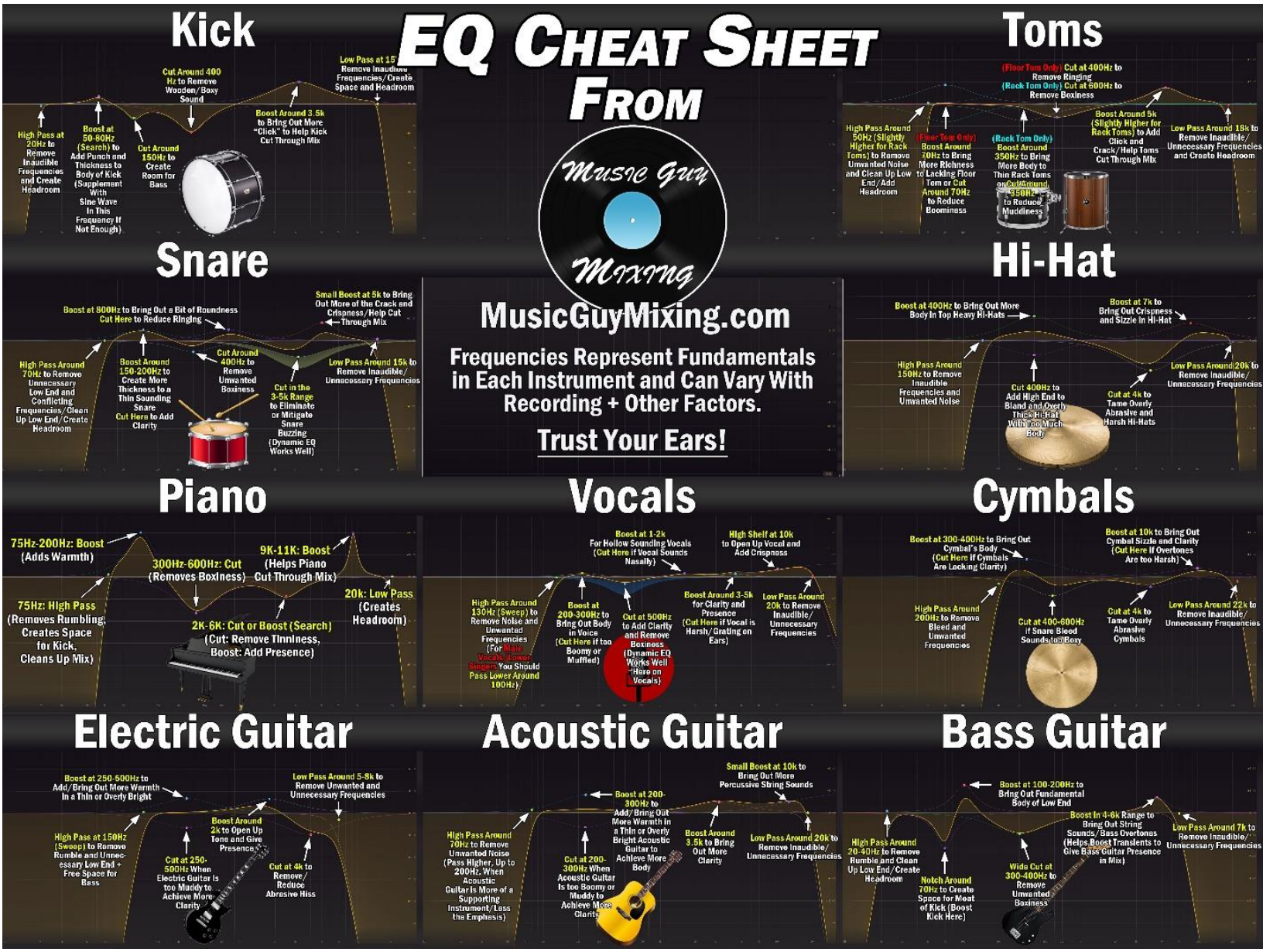
Note that this is much more of an issue with more impactful EQ adjustments you make, such as seriously boosting a narrow frequency.

If you ever begin to hear artifacts of phase issues like this, turn on the linear phase setting on your EQ (like with FabFilter).

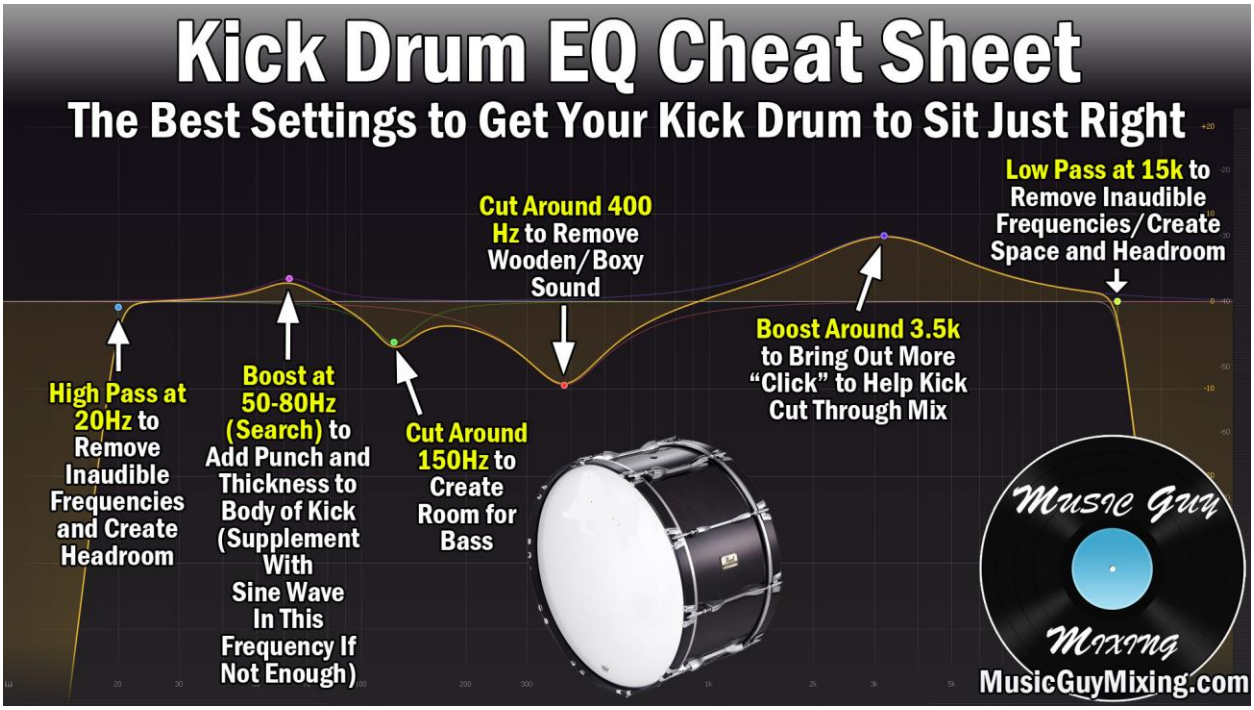
Now that we've talked about the different types and settings of EQ, let's get into the main focus: the cheat sheets for every single instrument!

# EQ Cheat Sheet

Here is my EQ cheat sheet for all of the most common instruments. I'll cover each one in more depth on the following pages to explain each of these settings.



# Kick Drum




## High Pass at 20Hz to Remove Inaudible Frequencies

Yes, you can (and should) even high pass your kick drum!

The lowest frequency the human ear can perceive is 20Hz. There's still audio information there, we just can't hear it.

With that in mind, there's no reason to keep anything below this in your kick.

Create a high pass filter to cut everything below it as this will still create headroom, allowing you to get a naturally louder mix (and **master**).

You can also sweep higher, but bear in mind that if your speakers, monitors, or headphones can't pick up these sub frequencies effectively, you should be especially careful.

## Boost at 50-80Hz for Presence

The thickness of the kick, that "boom" sound which resonates from it lives somewhere between 50-80Hz.

Solo this frequency range and sweep around until you find the loudest point, and try giving it a small boost. This is especially helpful if your kick is weak or top heavy.

**Note that if your kick is TOO boomy, then you might need to take a bit away from this spot with a cut.**

If you try boosting here and your kick still feels weak, try supplementing it with the **sine wave kick drum** trick. It works surprisingly well, particularly on poorly recorded or made kicks.

Also remember that the kick and bass share a lot of space in that low end (see the bass EQ cheat sheet for more information). Doing a complementary EQ cut on your bass at this section can help the kick cut through and clean up the low end.

# Cut Around 100-150Hz to Make Room for Bass

Just like we will make room on our bass track for the kick via EQ, we can make room for the bass on the kick track, as well. This means doing a cut somewhere in the 100-150Hz section on our kick for the fundamental of the bass to breath.

I always liken mixing to putting together a puzzle. Every instrument has its fundamental frequencies. Creating space for those instruments on other tracks where those frequencies aren't as important is the secret to creating a pro mix.

Speaking of which, this is a good time to mention the importance of mixing in mono, or even giving LCR mixing a try.

## Cut Around 400Hz to Remove Boxiness

If you solo your kick drum at approximately 400Hz, it will sound like someone is knocking on a piece of wood.

More to the point, it sounds bad and stifles the sounds of the important frequencies. Cut and forget, that frequency is dead to us.

## Boost Around 3.5k to Bring Out Click

We perceive higher frequencies as being closer and hear them first. This is well exemplified on the kick drum. The click of the beater on the skin helps the listener locate the anchor that is the kick in the mix. Without this, the kick is quickly lost.

The click is more prominent around 3.5k. I like to do a generous boost here as necessary to make that kick can be heard through the busiest moments in the song.

## Low Pass at 15k to Remove Inaudible Frequencies

We started by high passing, let's finish by low passing. 15k is a conservative point to start, though you can easily go far lower without sacrificing anything.

We want to keep the highest of high frequencies for the air of our vocals, synths, and cymbals. This creates headroom, as well, to get the aforementioned naturally louder mixes and masters.

# Snare


## High Pass Snare at 70Hz to Remove Unwanted Frequencies

Like every other piece in your kit and track in your set, you should high pass your snare.

I use a decent Q here of 30dB/octave for a clean filter.

A good starting point is around 70Hz. Try sweeping up and down from here. You can roll this higher, but you start to lose the body of the snare which we'll cover next.

This will open up space for your kick drum, not to mention clean up the low and create head room.

## Boost or Cut at 150-200Hz for Body or Adding Clarity

The thick body of the snare resides in the 150-200Hz area.

We can use this frequency range to shape the tone we want out of our snare or correct an issue.

If the snare is sounding too thin or needs more body, try boosting here.

If it's too cloudy or muddy sounding and you need some clarity, cut here before boosting the higher frequencies. Incidentally, check out my guide on the 5 **causes of a muddy mix** as I show how to clean up your mix.

The 400Hz area typically causes a flat, boring, boxy sound on snares.

## Cut At 400-600Hz for Boxiness

Try a small cut here to add some clarity to your snare, as well.

## Boost or Cut at 800 Hz for Roundness or Ringing

800Hz on a snare is an interesting area which can yield a couple different results.

If you have an annoying ringing sound on your snare, cut here to reduce the severity or remove it altogether if the ringing isn't too bad.

Conversely, a boost at 800Hz can yield a fuller, rounded snare sound which might be what you're missing. It really depends on the source material, so experiment.

## Cut at 4k to Remove Buzz

If you have snare buzz, try a cut in the 3-5k region.

I like a dynamic EQ cut here which adjusts depending on how prominent the problem is.

We don't want to hack away in this area as we're just getting into the crispness of the snare which helps it cut through the mix.

## Boost at 5k for Transients

Speaking of that crispness, 5k on a snare represents the stick on skin sound.

This "crack" is the frequency which helps the snare cut through the mix.

With that in mind, consider giving it a boost to help the listener lock on to those transients especially in a busier mix, particularly on a duller sounding snare.

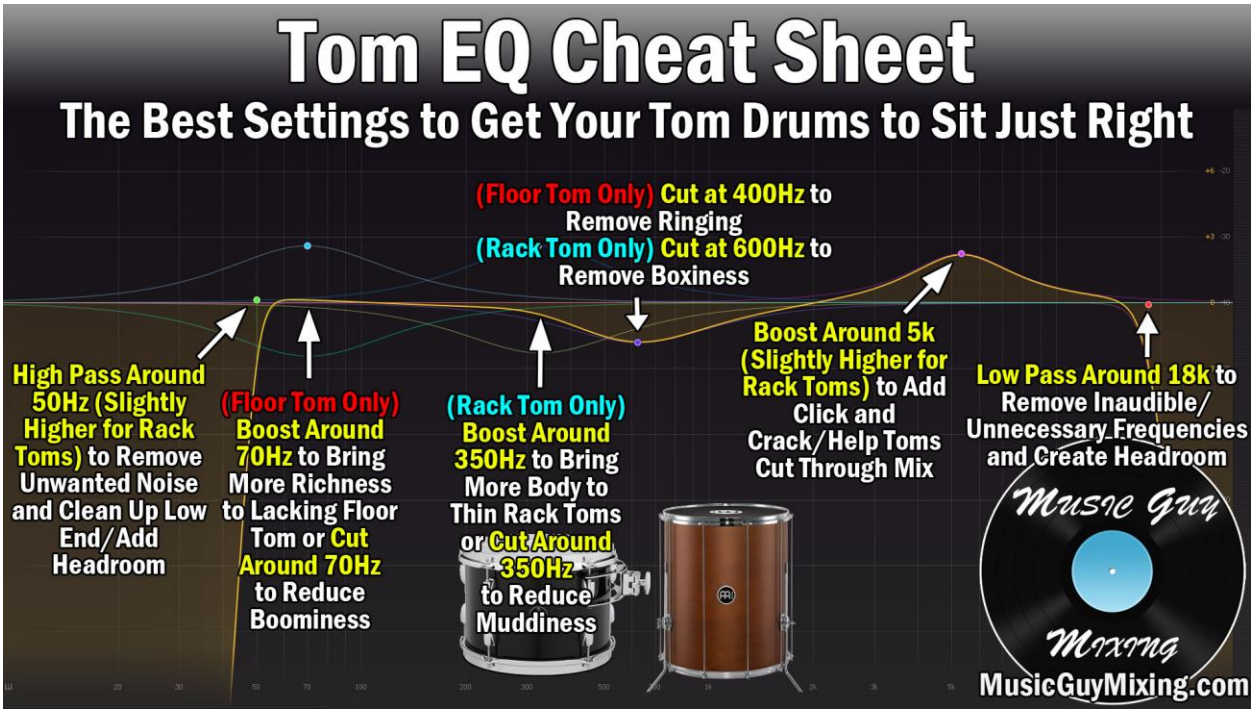
## Low Pass Around 15k

As always, be sure to low pass, cutting everything out starting around 15k.

Going lower than this creates more room for the cymbals and vocals, but it also eats into the openness of the snare and the previously mentioned crack which you should be able to hear if you're soloing the upper frequency range of your mix.

15k is a nice compromise to open the frequencies above it for more important instruments while maintaining the transient integrity of the snare.

# Toms




## High Pass Around 50Hz (Higher for Rack Toms)

The largest floor toms can be tuned as low as 60Hz, though they typically reside a bit higher as I'll discuss next. We want space for that kick which shares the same neighborhood. Thankfully the floor tom isn't featured nearly as much in most drum tracks, so the two don't step on one another that often.

Again, trust your ears for high passing on both the rack and floor toms and pay attention to that area with regards to the kick.

## Boost/Cut 70Hz on Floor Tom

We're starting to get into the rich fundamental frequencies of that floor tom low end around 70 or 80Hz. As such, you can boost if the tom feels lacking, or you can cut if the boominess is out of control. I won't insult your intelligence by saying make sure you've got the level set correctly to get the floor tom to sit in the mix… but keep it in mind.

## Boost/Cut 350Hz on Rack Tom

The fundamentals on the rack toms are more in the 200-500Hz area. Toms all come in different sizes with the larger ones have a lower fundamental frequency range. You've got to be flexible when you EQ tom drums for that very reason as it's more grey than other instruments you're going to EQ.

# Cut at 400Hz to Remove Floor Tom Ringing Sound

Ugh that awful ringing sound on the floor tom. Try an EQ tom cut around 400Hz and see if that dampens that ringing sound. You might not be able to remove it completely without affecting the surrounding frequencies for the worse, but you can certainly mitigate its effect in the mix.

# Cut at 600Hz to Remove Rack Tom Boxiness

I tend to find a lot of boxiness at 600Hz particularly on the rack toms. Again, your mileage may vary depending on the tuning and size of the tom, but I find a cut in this vicinity really opens things up. An EQ tom cut here places the emphasis on the lower fundamental and click of the rack tom, where it should be.

# Boost Around 5k For Click (Higher on Rack Toms)

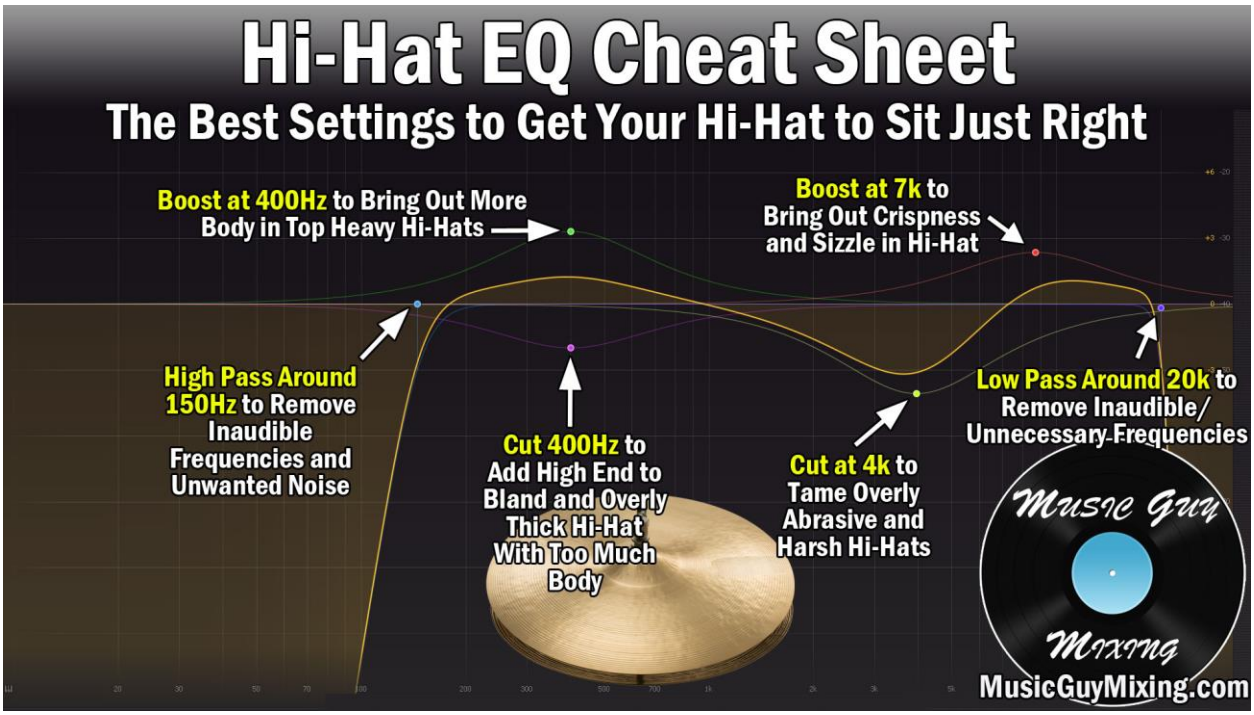
The click of stick on skin helps the toms cut through the mix and provides a bit of clarity. A boost in the 5k area usually works well on the floor tom.

Note that you might need to go a bit higher on the rack toms to the 7k, but sweep around until you find the loudest, cleanest part of that percussive click. I find soloing the tom and this frequency specifically to be helpful.

## Low Pass Around 18K

Another conservative pass filter; you can certainly go lower. Regardless, be sure to pass the top end of your toms in order to create space for your cymbals and, to a lesser extent, the vocals.

# Hi-Hat




## High Pass Around 150Hz (Sweep) to Remove Unwanted Frequencies

There's not much happening that low on the hi-hat except picking up room noise or bleed. When you're sweeping up, just make sure you don't start cutting into the body. Speaking of which…

## Boost or Cut at 300-500Hz to Add Body or Clarity

If your tone is too thin, you can use EQ to bring out more body in this anchor of the kit's cymbals.

The body of the hi-hat typically resides between 300hz-500hz.

Normally this is where we make a lot of cuts in mixing when it comes to using equalization as unwanted mud and room sounds can build up here.

By making a small boost in this range, you can bring out more of the body of the hi-hat which is incredibly useful if your sound is too top-heavy.

## Cut in 4k to Tame Harsh Cymbals

I find that a lot of cymbal samples sound too bright right out of the box to the point that it sounds grating. A lot of digital drum kits which attempt to emulate real kits sound especially bright in order to wow you. This is especially true if you're using a preset.

This is an issue with digital instruments in general. On their own, they sound great, but in the context of a mix, it's way too much mid-range and upper-mid range to the point that it can sound grating.

If this is the case, try placing a subtle attenuating EQ cut in the 4K range.

Always be sure to listen in the context of the full mix as not only will you perceive it differently than listening to it in solo, but the full mix is the only thing that counts.

It's also helpful to have a reference song playing with a cymbal you like the sound of so that you can A/B between them.

This keeps your own ears and perception grounded to remind yourself what your end goal is with the hi-hats.

Note that alternatively or in addition to using EQ to resolve tonal issues, you can reach for a multiband compressor particularly when you need to attenuate a section. This is especially useful when you're working with a human recorded performance or your midi arrangement is more dynamic.

If the cymbals are too grating, a de-esser functions very similarly to a multiband compressor but in that specific range. Most people just think of them for vocals, but they work great for reining in any offensive higher frequencies.

## Boost in 6-9k to Add Luster

If your hi-hats are disappearing in your mix, they could benefit from a small boost in the upper-mid range.

Specifically by augmenting them with a boost in the 6-9K range, you bring out more of the natural sizzle or sparkle of the instrument.

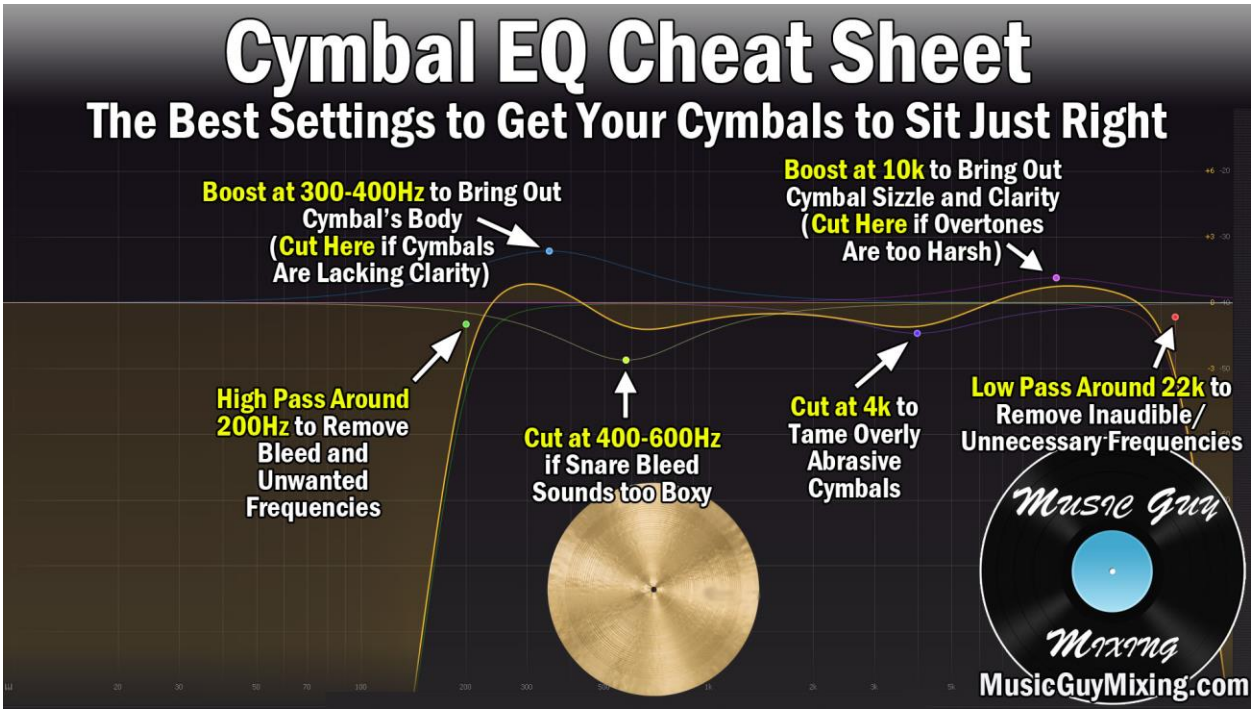
Without touching the fader or any spatial related processing, the hats immediately come closer to the foreground of the mix. The ears interpret higher frequencies as being closer, so these will make the cymbals stand out without any additional processing.

Be careful to not get carried away as if you supplement this range too much that will be all you can hear. Even worse it can begin to sound abrasive, which leads us to our next issue.

## Low Pass at 20-22k (Listen)

Lastly, low pass your hi-hat somewhere between 20-22kHz. This removes any inaudible sounds which aren't benefiting the tone. It's slight, but this also helps to clean up our mix and create headroom for the **mastering process**.

# Cymbals




## High Pass at 200Hz

Once again we want to cut out room noise and frequencies which aren't adding to our cymbals.

There's nothing below 200Hz that we need, so set your high pass filter here as a starting point.

Admittedly we're cutting out a lot of the bleed from the kick and snare in the case of recorded drums, but we

don’t want those frequencies represented on these microphones and tracks anyway.

You can pass higher than 200Hz, but you may begin to lose the body of the cymbals. Trust your ears here.

## Boost or Cut at 300-400Hz to Bring Out Body, Add Clarity (Respectively)

With the body of the cymbals residing in this area, boosting or cutting will yield different results.

If your cymbals are too thin or too weak sounding, try a small boost here.

Conversely, if your cymbals are lacking clarity even with the subsequent recommended moves, try cutting here.

This is a good place to cut in particular when the cymbals are too dark.

# Cut at 400-600Hz to Remove Snare Box Bleed

Assuming you don't have isolated drum kit pieces to work with, you'll have snare bleed on your overheads/cymbal microphones. As I covered in the snare section, the 400-600Hz region is a bad spot for that bland boxiness that kills the excitement in the tone.

This region even pokes up on the overheads, and sometimes can be worse with the added room noises.

Try a cut in this region if snare bleed is an issue on your cymbal track.

# Cut at 4k to Remove Harshness

There's that problem frequency again.

The human ear is especially sensitive in the 2-5k region, and the 4k is near dead in the center. On cymbals,

especially on some samples, this area becomes a problem with all of the other instruments building up here and your mix can turn into a literal pain in this area.

Try a cut here or even a dynamic EQ cut to manage the hiss of the cymbals.

There's nothing wrong with darkening the tone of your cymbals a bit, especially to save the ears. Some saturation works well in general for smoothing out an abrasive cymbal, as well.

## Boost at 10k to Bring Out Sizzle

The overtones of the cymbal are heard around 10k.

A small boost here can help it cut through and bring out a bit of desirable sizzle.

Conversely, if they're TOO bright, try a small cut here to dull them for the better.

## Low Pass Around 22k to Remove Inaudible Frequencies

I liken this move to high passing your kick drum at 20Hz which I recommended earlier in the kick drum section.

Generally speaking, the cymbals should represent the highest frequencies in your mix. That doesn't mean our mix can't benefit from a low pass on the cymbals. Unless you're a dog, frequencies above 20k are generally inaudible. Cut here or more conservatively at 22k to create a bit more headroom and naturally get more level from your finished song.

# Piano


## High Pass Unwanted Frequencies at 75Hz (Listen and Sweep)

There's an unpleasant rumble typically below 75Hz which comes from the lowest notes. Besides the fact that they add nothing to your mix, they interfere with your kick and any sub bass sounds.

Wear a pair of headphones which have a good low end and solo a high pass filter on the lowest end of the piano. You should be using a somewhat aggressive curve here

like I’m using with the 36dB/Octave and a level Q right at 1. This should make the high pass look like a slightly rounded cliff.

Now play the part of the piano track when the lowest notes are playing and begin sweeping from the bottom, left to right, until you start to hear the musicality of the lowest notes, then roll it back a few Hz.

75Hz is a good place to start, but it might be higher for your recording.

## Boost 75Hz-200Hz for Fullness

This is a good place to give warmth to the piano via EQ. Solo and sweep around the 75Hz to 200Hz area to find the center that gives the piano that body that sounds best.

Boost roughly 6dB with a wide enough Q to get a good sampling otherwise you won't be able to make an informed decision.

A Q between 2 and 4 should be wide enough to give you an effective sample size to work with.

You can then sweep until you find the fullness you're looking for down here.

I should mention that you need to make these changes with the context of the mix in mind.

You can get that warmth from a piano with a boost in the 75Hz-200Hz range, but a lot of other instruments get their warmth from the same place.

In a busier mix, there's simply not room for everything, so a cut here can create clarity to save room for the

prioritized instruments like a kick drum, bass, or even vocals.

Alternatively, if you've got more of a vocal with a piano accompaniment focused mix, you can be more aggressive with these boosts as it's a much sparser mix.

Moving on!

## Cut at 300Hz-600Hz (Listen) to Reduce Boxiness

Here you want to sweep around to find the frequencies which aren't contributing to the sound.

When testing my sample, I found that at around 380Hz in particular there was a boxy "waaaa" kind of sound. A/B testing it before and after the cut made the piano sound a lot cleaner as it placed a greater emphasis on the lower warmth and the higher presence.

# Sweep at 2kHz-6kHz for Presence Vs. Tinniness

There are no across the board rules for piano EQ in the upper-mid range frequencies.

Sometimes a small boost can give you the presence you're looking for, sometimes you can cut out a little tinniness and make room for other instruments there.

Once again you need to defer to the rest of the mix.

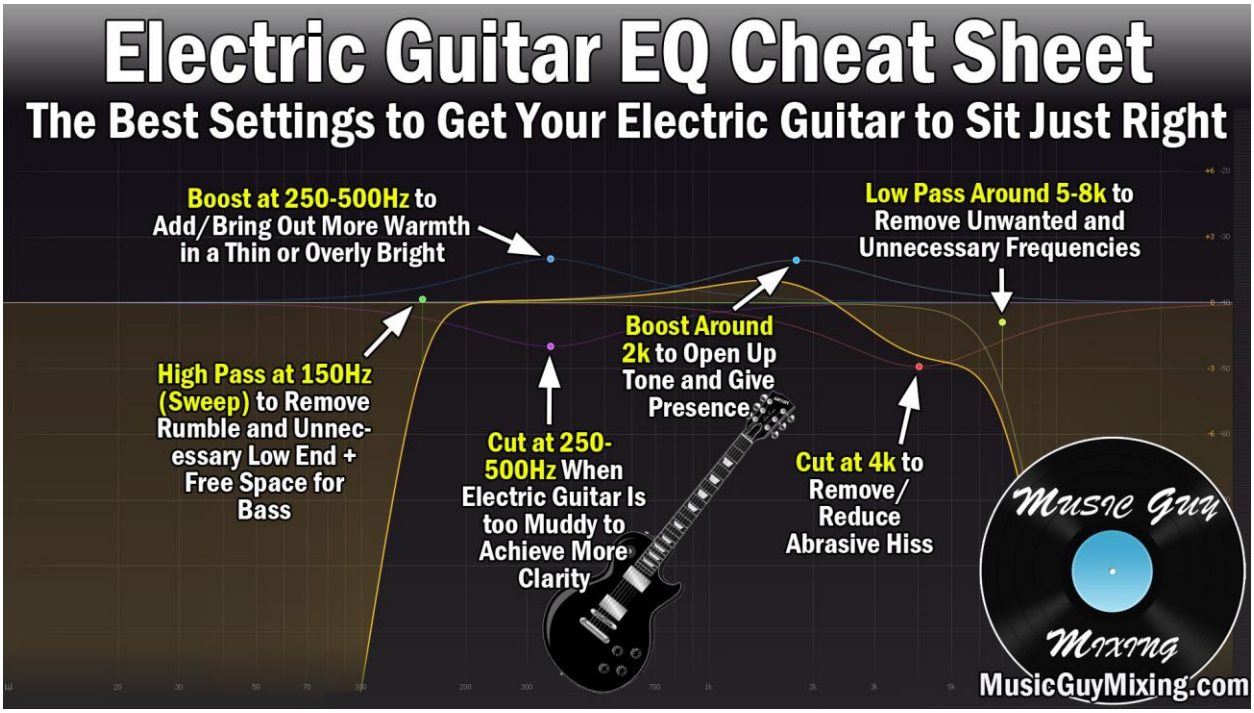
In this example I found a pocket of tinniness I felt I could do without around 2.5kHz and made a small cut. Your mileage may vary depending again on the type of piano you're EQing.

# 9kHz-11kHz – Boost for Transient (Optional)

You'll get a bit of that hammer hitting string transient sound with a boost in the 9K-11K range.

This is completely optional, but worth noting it's there if you want the piano to cut through a bit more. It's the same idea as boosting around 5k or so a snare drum to get that first transient crack of stick on drum, albeit a bit higher up.

# Electric Guitar




## High Pass at 150Hz (Sweep From Here)

First let me acknowledge that, yes, I know that the lowest note on a guitar is typically tuned to roughly 82Hz. And yes, I'm still telling you to START sweeping at 150Hz with a high pass filter.

You should try sweeping that filter up and down, playing the guitar in the context of the mix.

Is the guitar disappearing, or is the mix sounding cleaner by way of tidying up that low end? There's a lot of rumbling associated with the low end of a guitar, especially on distorted chords.

It's similar advice which I'll give in the upcoming acoustic guitar section.

For busier mixes where I've got a lot of tracks, I'll sweep higher and leave everything below 150Hz entirely for the bass.

Incidentally, also refer to the upcoming bass section to really clean up your low end and with it your mix.

If it's a sparser mix with less tracks, I'll roll the high pass back lower to keep more of that low end intact. In those cases the mix can benefit from that fatness on the low end.

Remember there's only so much space to go around in a mix, so sweep and decide how much of that thick low end you need and sounds good (in the context of the mix).

Still, give it a try. Let the guitar and bass work together to complement one another as the bass works low and the guitars populate the low-mids. You might be surprised how you didn't need the lower frequencies on the guitar you thought you did.

## Cut or Boost at 250-500Hz

This is the where the thickness of the electric guitar inhabits.

If the guitar sounds too thin (even after considering the high pass from the last point), try a small boost in this range.

Conversely, too much prominence in this range and that thickness quickly turns into boxy mud. If that's the issue, try a small cut here before adding higher frequencies.

Cutting here is not unusual. It's commonplace in a lot of modern rock to really scoop out the low-mids on guitars to create a natural emphasis on the clarity-lending frequencies.

## Boost at 2k to Give Presence

The 2k area has a bit of magic to it on a lot of electric guitars. When you need a little extra life out of an otherwise bland guitar, try even a small boost here.

## Cut at 4k to Remove Hiss

There's a nasty hiss which sometimes comes out on distorted signals at 4k which can fatigue the ears fast.

Like with everything in mixing, it helps to have a reference track of electric guitar that you like the sound of so you can keep that context.

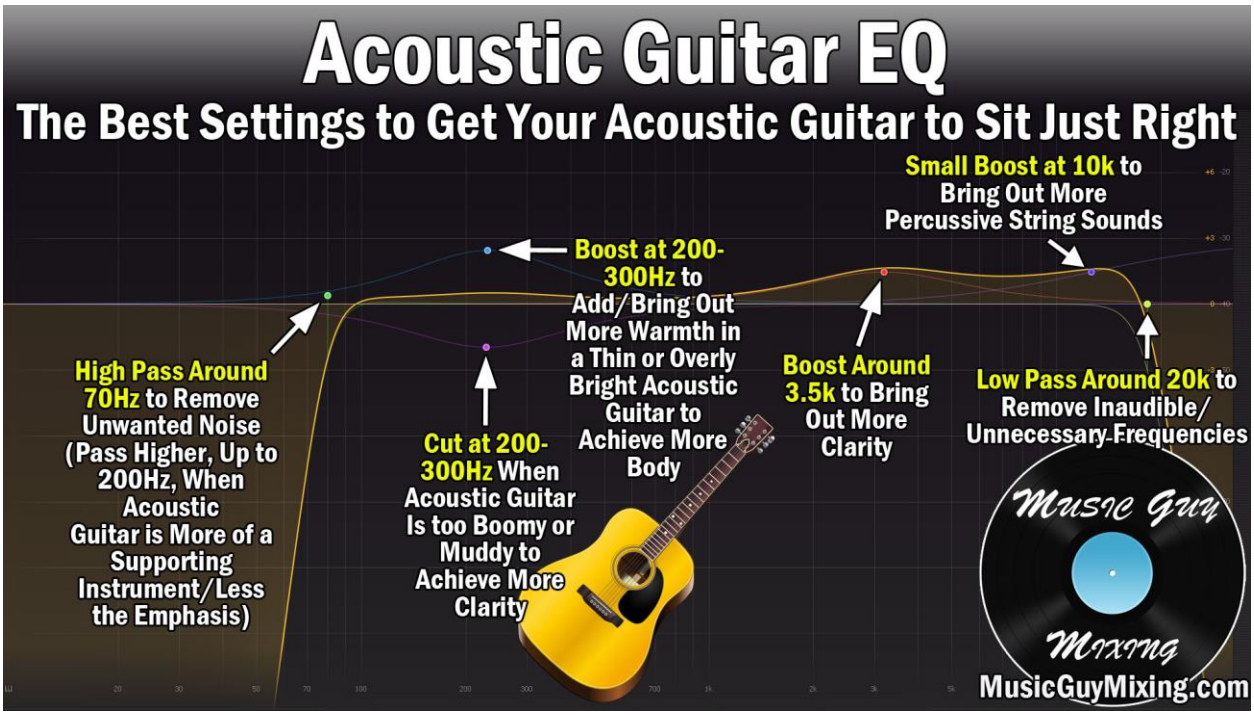
My mentioning that at this point is no coincidence. Before I would use references I'd let those high frequencies get out of control and compared to well mixed guitars it would sound like a buzz saw (not a good kind).

## Low Pass Electric Guitar at 5-8k to Remove Unnecessary Frequencies

Low passing your electric guitar is important, but the exact location is more of a judgement call.

For distorted guitar, I tend to pass on the lower side in the 5-6k region. When using electric guitar EQ, remember that there are a lot of instruments where everything 5k and above are much more important. Filtering this out here creates space for vocal air, cymbal sizzle, and the occasional pad or other synth part.

# Acoustic Guitar




Acoustic guitar is one of those instruments which typically runs one of two extremes: it's too boomy and muddy, or it's too bright and lacks body.

Regardless of equipment or performance, you often get these results especially due to poor recording techniques.

For instance, if someone doesn't know any better, their first instinct when recording acoustic guitar is to place a

microphone primarily in front of the sound hole. This results in a booming, bass heavy sound lacking in clarity.

If this describes the tone you're getting from your acoustic guitar, some EQ sculpting on the low end can go a long way.

**As a quick aside, you can't go wrong with placing the microphone a few inches in front of the 12th fret. This yields a nice blend of body and clarity.**

## High Pass at 70Hz

For our first step, create a high pass filter at 70Hz.

The lowest E string in standard tuning resonates at 82Hz when played open, meaning E2. If you're tuned a half step down, this turns into roughly 78Hz for the open D#2.

Below that you're getting into room noise and other unwanted noise from the instrument itself. Setting a filter with a relatively sharp roll off to cut out everything below 70Hz will clean up the track and carve out that frequency for your kick drum (if applicable).

Just use 70Hz as a starting point, then sweep higher with that high pass until you start to lose the fundamental low end of the track.

For mixes where the acoustic guitar plays a greater role, we want to keep more of that low end intact as this might represent the bass for the song.

A lot of singer songwriter and folk music is stripped down to primarily a vocal and the guitar. In this case I wouldn't filter out much higher than 70Hz as that's essentially our low end for that song.

Alternatively, if the acoustic guitar is more of garnish for the mix, one of many tracks, you might want to move that filter higher to remove even more low end.

When I've got a busy mix where the acoustic plays more of a supporting role, I mostly want the sound of the strings which are much higher in the 2k and up range.

You can remove more of those low frequencies of the guitar when you've got something representing the bass in the mix, whether it be a bass guitar or synth.

Try moving the filter up to 200Hz and see how it sounds playing alongside the bass if this is more similar to your mix. Like with the kick, this provides a dedicated space for the bass and removes a lot of mud by removing competing frequencies from the mix.

A general rule I follow is the more prominent the acoustic plays in the mix, the less of those lows and low-mid frequencies I filter out with the high pass filter.

One last thing to mention when high pass filtering is to reference the section with the lowest played notes so you know the most relevant part which will be affected.

## Sculpt at 200-300Hz to Affect Body/Warmth or Clean Mud

This area will sound wildly different depending on the acoustic guitar, how it was recorded, etc.

This is why rather than giving a definitive cut or boost recommendation here, I say try both in this important frequency range for an acoustic.

This is where the body of the acoustic guitar comes out, so if you find that your track is lacking in warmth, a little boost here can do wonders.

Alternatively, a small cut in this section can go a long way in cleaning up the sound of an acoustic lacking in clarity.

If the body is overwhelming the overall tone, try a cut here.

Try both and trust your ears to determine where the improvement lies.

## Boost at 3.5k for Clarity

The clarity in the acoustic guitar can be brought out around 3.5k. I almost always do a small boost here to bring out more clarity from the tone and give it a bit more shine.

Remember as always that wider EQ bell curves sound more natural than sharper, surgical boosts or cuts.

As such, I'm including at least 1k on either side of that 3.5k.

This brings out more of the clarity of the strings and top end in general. Unless your acoustic guitar is too bright or harsh, bringing out more of the strings here usually sounds good with this boost.

The strumming or picking percussive sounds of the strings themselves can be brought out with a small boost at 10k.

## Boost at 10k for String Percussiveness

This is especially helpful if your acoustic guitar isn't cutting through the mix quite enough.

Another instance where this can help is if the acoustic guitar is just more of a featured player in a busy mix.

In a lot of rock and pop, the acoustic guitar is often buried in the mix and is almost utilized more as a percussive instrument with the crispness of the strumming.

Here it’s not about the notes or chords being played but the sound of the steel to add to the overall brightness of the mix.

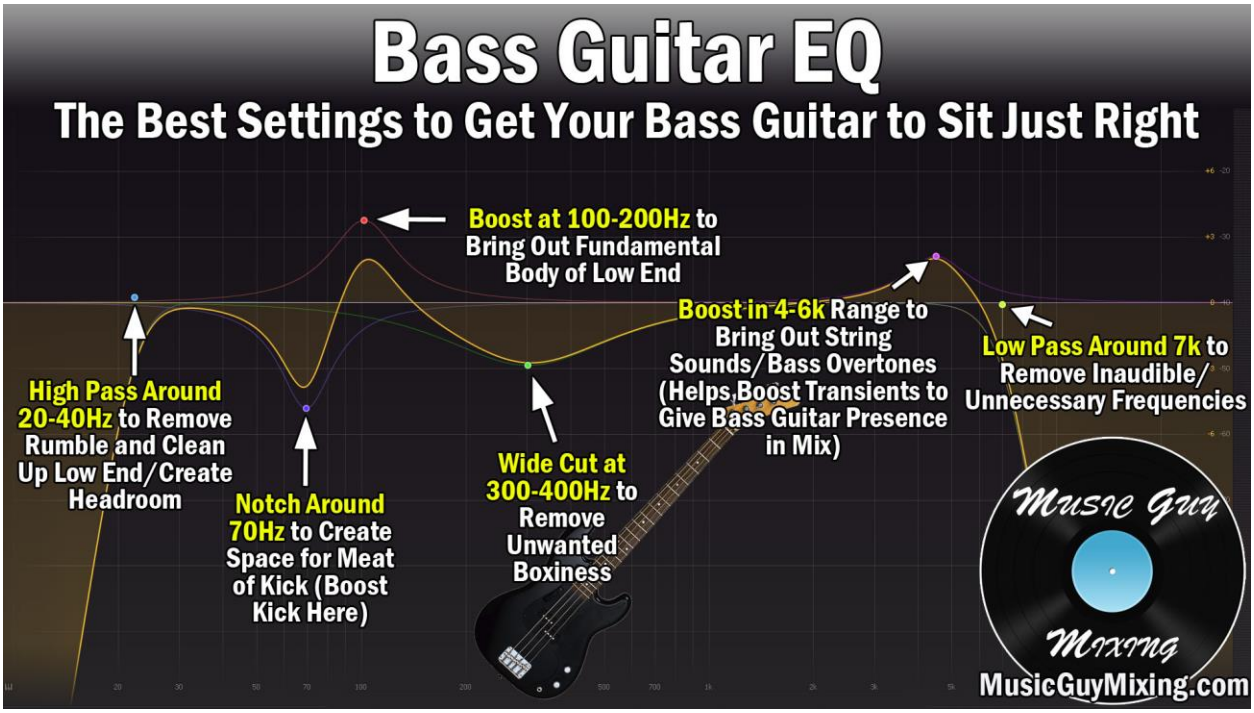
If you took the earlier tip to heart about high passing out more of the low end and you want the acoustic guitar to be more felt than heard, definitely experiment with a little boost here to bring out those strings a bit more.

## Low Pass Around 20k

This is just a little housekeeping. I once again recommend high passing around 20k on most tracks in order to create more headroom for the **mastering engineer**.

If you solo out everything above the low pass, meaning you’re playing everything above 20k then you’ll be hard pressed to hear anything without really cranking it up. Yes there are still (impractical) sounds there, but just like with high passing the lowest inaudible frequencies on most tracks, you’re clearing up space in the mix.

# Bass Guitar




## High Pass at 20Hz (Sweep)

First I like to drop a high pass filter on my bass guitar EQ with a relatively sharp drop off around 20-40Hz. In EDM and more bass heavy genres you might want to be a bit more conservative here, particularly if you're using a sub or other type of synth bass. The higher you pass here, the cleaner that low end will be and it will leave space for the lower end of the thud of your kick.

# Cut at Kick Fundamental (Typically Around 60-70Hz)

Like I mentioned in the kick drum section, I like to find where the thickest part of the “thud” of my kick drum is.

I’ll then notch out space at this frequency on the bass track accordingly. Creating separate spaces for the fundamentals of the kick and bass allows them to complement one another and makes for a MUCH cleaner low end.

For me, it’s easy to know the exact frequency of the fundamental of my kick because sometimes I use the **sine wave kick drum** trick I’ve talked about before. This involves using a sine wave to simulate the effect of that thickness that kick drums always seem to have on the mixes of the pros. Most of them use this trick themselves, so that makes sense (but I digress!).

Setting the note the sine wave plays to the key of your song means you know exactly what frequency

fundamental of your “kick” is. Make a cut in the bass guitar EQ right there to reserve that space for the kick.

## Boost at Bass Fundamental (Typically Around 100Hz)

By the same token we can now also give the fundamental of our bass a little boost. It’s typically around 100Hz, give or take. Sweep around with your EQ to find that nice thickness of your bass regardless of the notes being played and give it a slight boost right here.

Going back to the complementary EQ when we made that cut for the kick in that 40-80Hz area, we now want to make a notch in the EQ on our kick drum around 100Hz as well.

Cutting there in the same place we just boosted our bass guitar EQ gives the bass its own space to thrive there so it’s not fighting with the kick.

# Cut Around 300-600Hz to Remove Boxy Low-Mids

Once again, as I covered in my overview of the 5 typical culprits which are responsible for a muddy mix, the low-mid range of 250-600Hz is where a lot of unwanted sounds pile on top of one another.

This creates a clogged, swampy, foggy, (insert your undesirable adjective here) effect in your mix.

The bass guitar is no exception, so I like to make a wide cut in that 300Hz range to clean up some of that sound I can only describe as boxy. This also creates some space for the electric guitar if you've got some.

Also remember that I recommended complementary moves for the bass in the electric guitar section, but yes, cleaning out this boxy frequency on bass allows the low thickness and upper transients to shine through. Speaking of the high end.

# Boost 4-6k for Presence

If you feel like your bass guitar is getting lost in the mix, you might need to bring out the transients a bit more with a boost in the upper frequencies. Similar to bringing out the “click” of the kick drum with a boost in this area, on the bass guitar a boost in the 4-6K range you bring out the metallic sound of the strings.

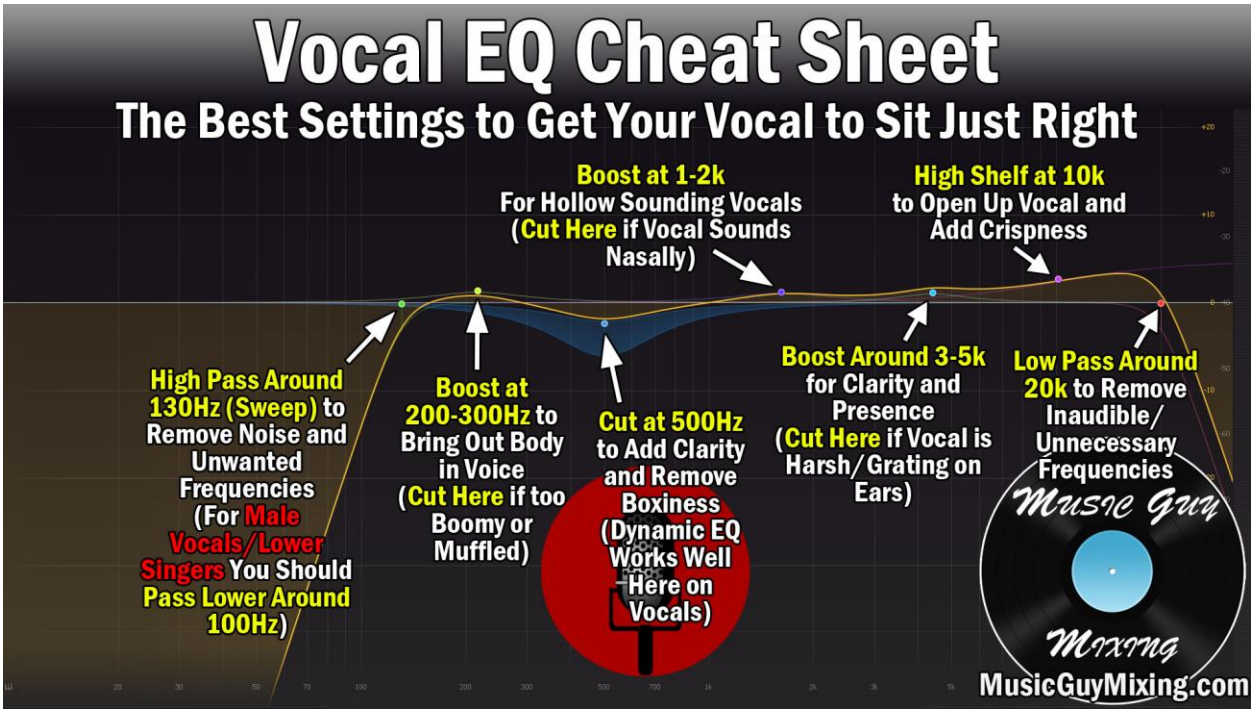
This helps listener find the bass guitar as it cuts through the mix. Once again, sweep around the upper frequencies to find where a boost would be best served and give it a little push up to give the entire bass more presence.

# Low Pass Filter Around 7k

Lastly, roll off everything above around 7k with a low pass filter. We got the overtones and buzz from the last boost, so anything above that is unnecessary. Roll it off and save that space for the cymbals, vocals, etc.

Also consider rolling off everything over 20k via a low pass filter in order to remove unnecessary, inaudible noise. You can even come down lower since it's the bass track; just put that filter on and sweep down until you start to hear the highest end of the bass strings.

# Vocals




Admittedly male and female vocals vary slightly in their fundamental frequencies. Not just male vs female, but also types of singers and the registers their voices occupy.

Obviously the “body” of a baritone singer’s voice will vary from that of a soprano. That said, this vocal EQ cheat sheet will serve as a great starting point for the major relevant frequency ranges and give you advice on what to do at each and the effects for each.

# High Pass Around 130Hz (Sweep) to Remove Unwanted Frequencies

We want to high pass our vocal because we can eliminate room noise and other unwanted frequencies below 100Hz. 130Hz on a vocal is a good place to start sweeping on most vocals with an average Q (I use 30dB/octave).

Lower/deeper vocalists may begin to sound thin if you high pass at 130Hz so trust your ears.

While I typically recommend making most EQ adjustments in the context of the full mix, this is one of the things I like to do in solo as you really don't want to lose the anchor or bottom of the body in your vocal.

Filtering here not only cleans up the vocal itself, but it cleans up the mix and creates more room for a cleaner low end for bass and the kick as mentioned earlier.

We just talked about the edge of the body, the 200-300Hz area is where the real fundamental body of the vocal resides on most vocals.

## Boost/Cut at 200-300Hz to Bring Out Body/Add Clarity

Deeper vocals will favor lower, higher vocals… well, higher.

What you do here will depend on the circumstances of the recording.

If the vocal is sounding thin, try a boost here to put more of that body into the vocal.

If there's more room sound in the vocal, you might need to make a small cut here to bring more clarity to a muffled, muddy vocal.

If the vocal is lacking clarity in general, a small cut here along with the subsequent vocal EQ recommendations can help open it up.

Cutting here will quickly thin out the vocal, so be conservative and try the next vocal EQ tip before you cut here.

Incidentally I typically favor a small boost in this section make it feel a bit sturdier in the mix.

## Cut at 500Hz to Remove Boxiness/Add Clarity

Before you start boosting in the high end for a muffled, muddy vocal, try a cut in the 500Hz region to remove boxy frequencies which typically build up here.

This is a great place to clean up a lackluster vocal. A cut here will help clear the vocal up by greater emphasizing the high end.

I like a dynamic EQ cut here in particular to regulate a greater cut as necessary/different tones, notes, or syllables.

This is another one which goes back to how the vocal was recorded. If you're getting a hollow sound in the vocal, try a boost in the 1-2k region.

## Boost/Cut 800Hz-2k for Hollow Vocals/Nasal Vocals

Conversely, if the vocal is more nasally, a cut will reduce this effect. A cut here works wonders on some vocalists who are more nasally when they sing in general. With some singers I work with, I always pay extra attention to this frequency range.

The lower end around 800-1000Hz is typically where you get that wonky sound, but it really depends on a number of factors so pay attention in that entire area.

# Boost/Cut Around 3-5k for Presence/Reduce Harshness

Remember, our ears are especially sensitive in the 3-5k region. Too much sound “information” here and our ears become fatigued. This is not the effect we want our mix to have on our listeners.

As such, you need to treat the 3-5k vocal region carefully. I usually have an EQ filter set at 4k with the Q set to encompass 1000Hz on either side.

If your vocal is a bit flat even after the earlier vocal EQ tips, try a small boost here for presence in the vocal.

Conversely, if the vocal is sounding too harsh as it is, try a small cut here to tame this region.

Another tip, some saturation also works well to smooth out a harshness in the 4k range. Drop a tape saturation

plugin alongside your EQ to introduce some warmth to a harsh vocal.

## High Shelf at 10k to Open Up Vocal

The overtones can be brought out in the vocals around 10k.

It’s a cliche and difficult to describe concept, but if you want to hear more “air” from the vocal, try a high shelf at 10k.

## Low Pass Around 20k to Remove Unwanted Frequencies

Push it up to help that vocal sit just right and add a little crispness to it.

There’s nothing audible above 20k, so introduce a low pass filter around here to buy yourself some head room.

# In Summary

Once again, remember that the frequency ranges listed in this EQ cheat sheet are meant to be a starting point.

That's precisely how I use them every time I begin to EQ an instrument, but the main point is to always trust your ears.

To your success in making better mixes!

-The Music Guy

P.S.

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