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The Ultimate
Compression
Cheat Sheet
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Bypass
CLA CLASSIC COMPRESSORS
RIGHT CHANNEL
RIGHT-VERT
A → B
Setup A
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WAVES AUDIO LTD.
COMPRESS
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MusicGuyMixing.com
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What is Compression

Don't worry – as I mentioned in my EQ cheat sheet (grab it for free here to get a specific EQ guide for every single instrument in your mix), I'm not going to get too technical here.

If you want to just skip to the visual compression cheat sheets I've created to teach you how to perfectly compress 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 compression, what it is, what it does, and the different types of compressor plugins and their settings for some practical context on the cheat sheets themselves.

So what is compression?

Compression refers to reducing the amount of dynamic range for a clip of audio or, more practically speaking, an

entire track. This is done through a hardware or software/plugin based device called a compressor.

Dynamic range refers to the difference between the quietest and loudest points on a track. In other words, a compressor is a type of hardware or software based plugin which brings the quietest and loudest parts of your audio closer together, thereby reducing the dynamic range.

When you listen to someone sing you can hear the dynamic range in the performance. When they're singing the verse or lower/more comfortable notes, they're generally quieter.

When the singer gets to the chorus or higher notes that require more belting out, they get louder.

You want a certain amount of dynamic range in your audio because it sounds more natural than if everything were the same volume.

More than this, dynamic range keeps the listener's attention as the volume goes up and down, preventing fatigue.

We won't want TOO much dynamic range, however, as will make the track sound weaker, not to mention it makes it difficult to effectively set the fader volume for the track in the context of the mix.

This is why we turn to a compressor to bring control to the volume differences in our audio.

Through compression, we impart more power and energy to that audio, albeit at the expense of some dynamic range.

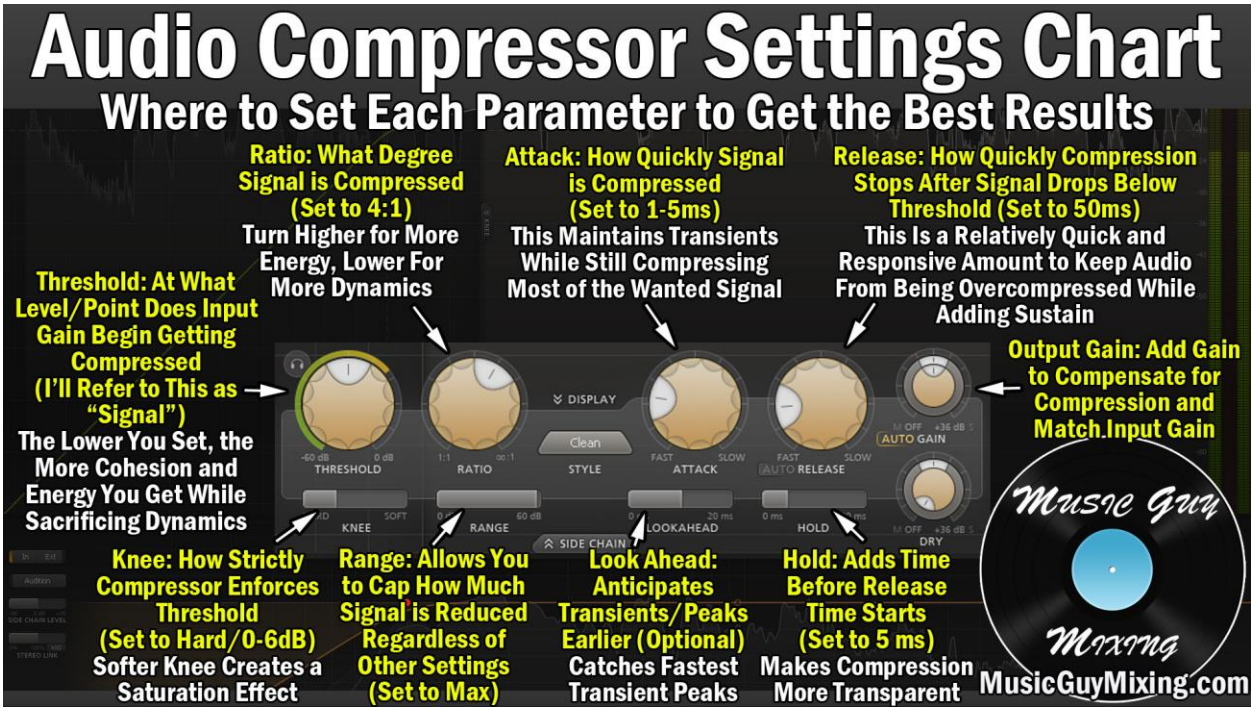
So how does a compressor work?

Compression Settings

The best way to explain how a compressor works is to cover the basic settings you'll find on most types of compressors.

A basic understanding of each of these settings/parameters is key to understanding why I recommend adjusting each setting to where I do in the cheat sheet section later on.

This image is taken from my overview of the audio compressor settings and gives a brief look and a general recommended setting for each particular parameter (we'll get into the actual recommend settings for each parameter later in the cheat sheet section):

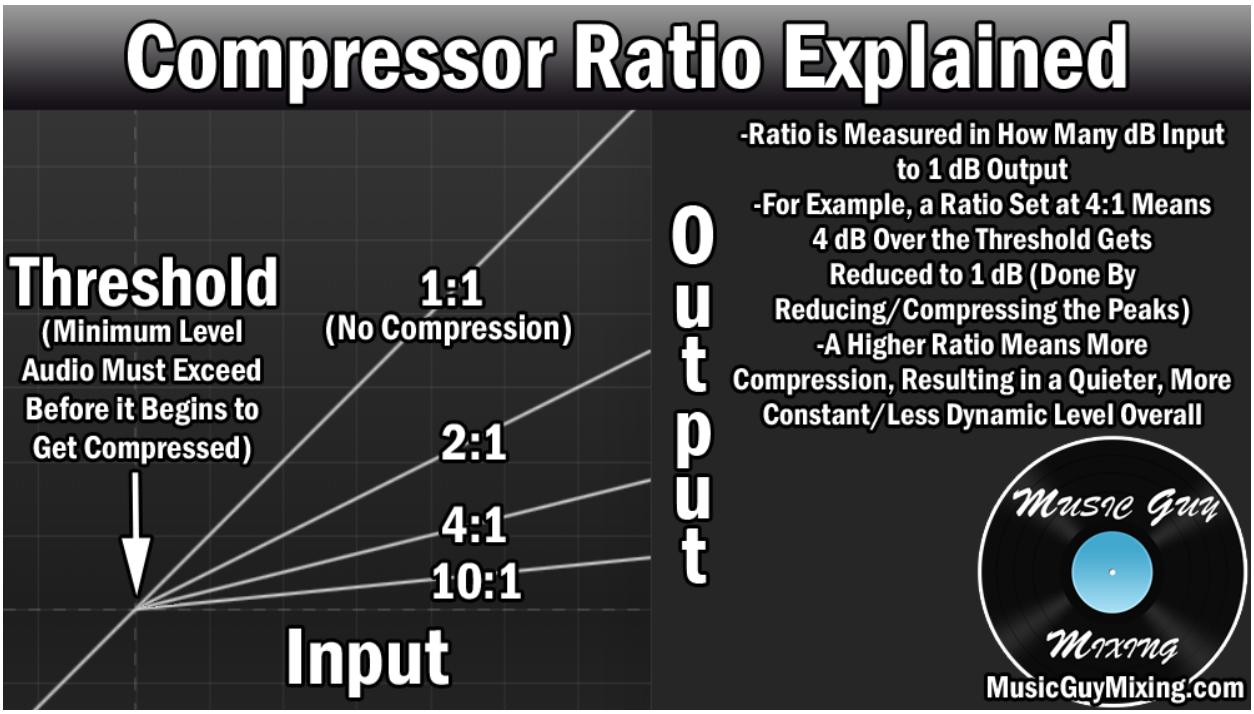


Let's briefly talk about each parameter more in depth to better understand how it's affecting the compression of your audio.

Threshold: The compressor's threshold determines what volume the audio has to reach before compression will engage. If you set the threshold too high, meaning above the loudest peak of your audio, the compressor will do nothing.

Ratio: The ratio on a compressor determines to what extent or degree the audio is compressed once it surpasses the threshold.

Ratio is measured in terms of X:1 where X is how many dB input to 1dB output.

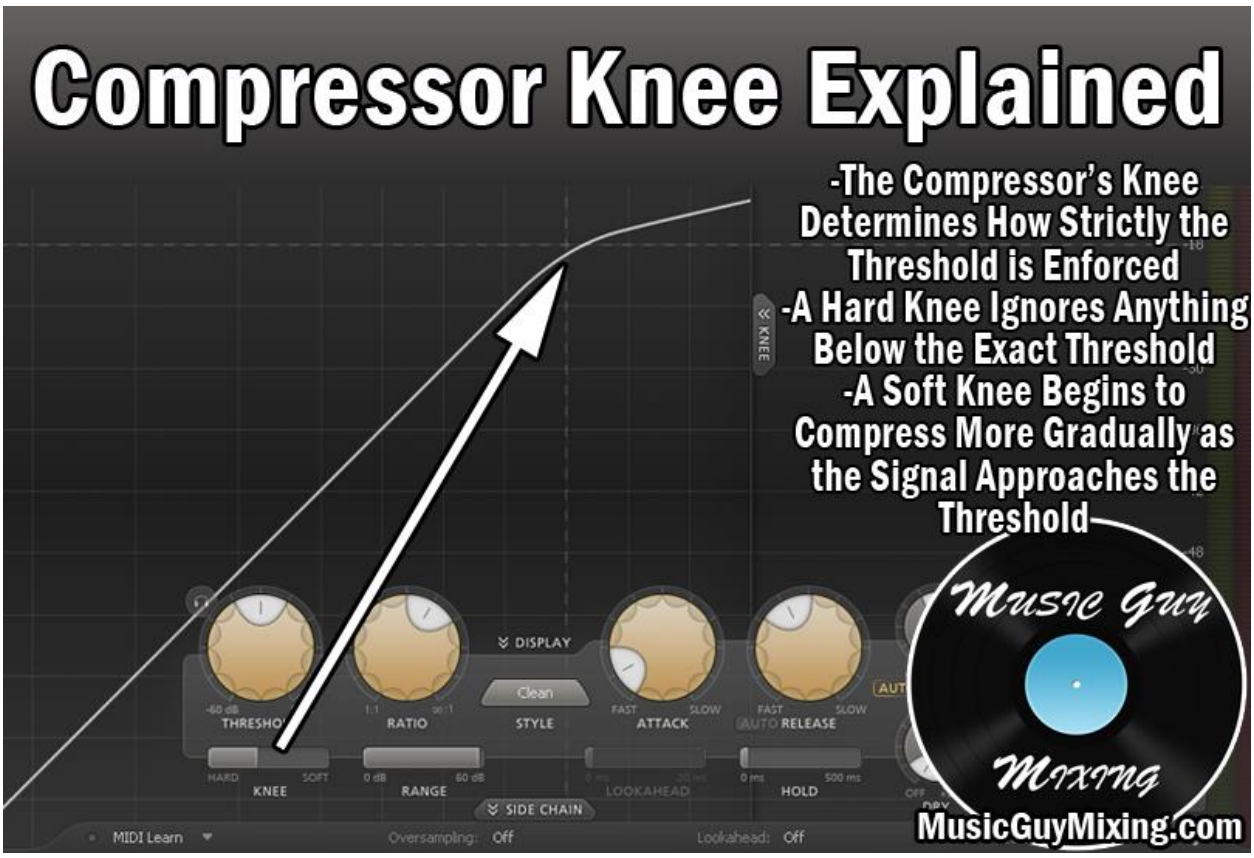


Don’t worry, the math doesn’t matter. All you need to really know is that the higher the ratio, the more that peaks/anything above the threshold gets turned down.

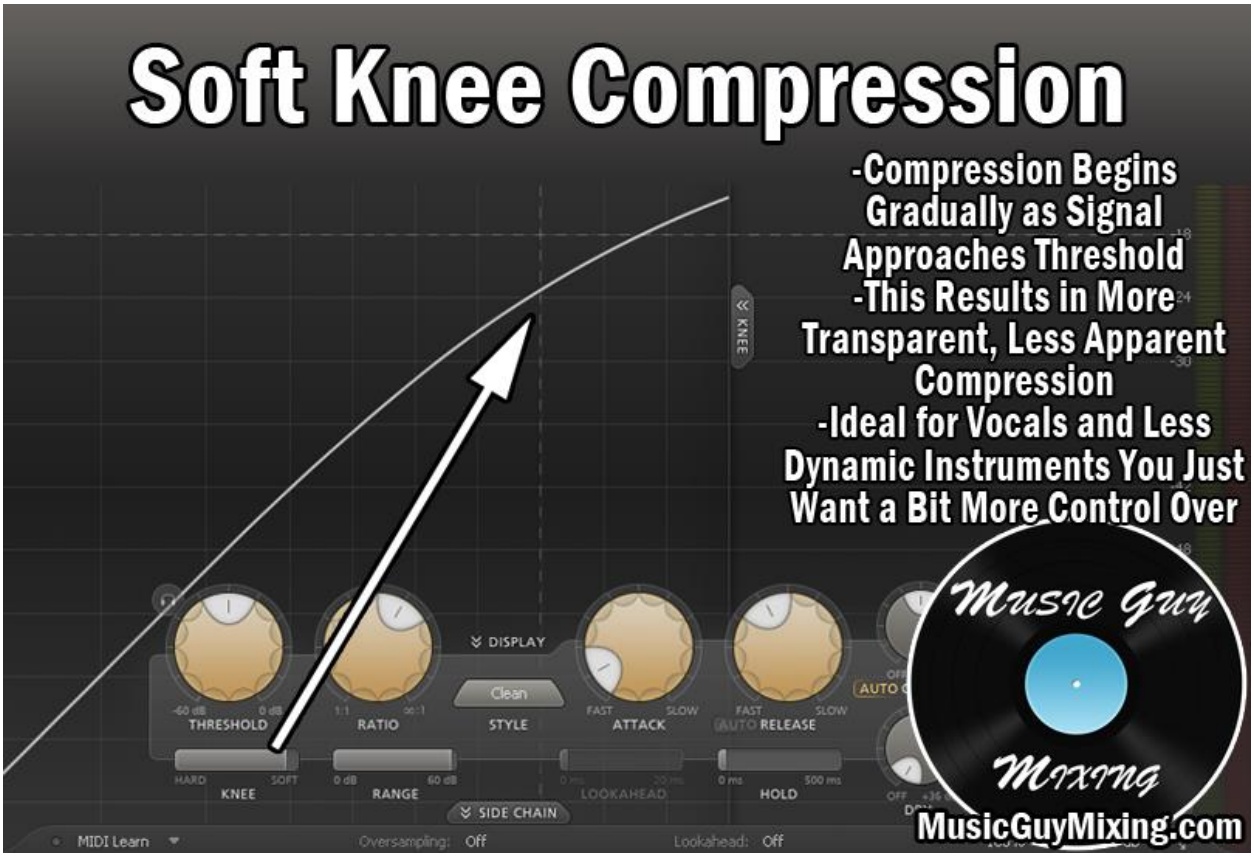
4:1 is an average ratio which works well in most situations in that it’s subtle enough to not clamp down and squash your audio but there’s enough there to provide more than a little glue.

Once again, we'll cover the exact ratios to dial in for each instrument later in the cheat sheet section.

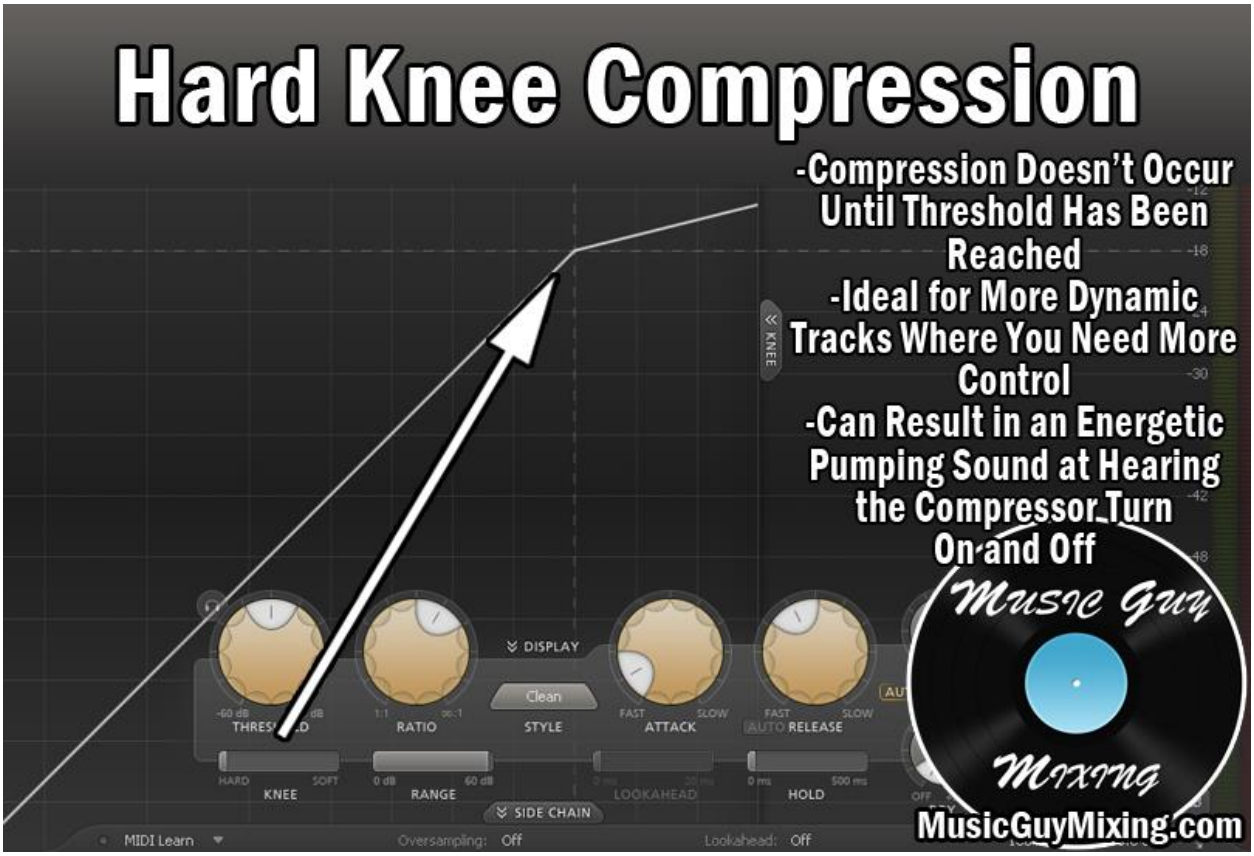
Knee: The compressor knee determines how strictly the threshold is enforced:



We can use a larger/softer knee to begin compression as the signal approaches the threshold, albeit at a lighter ratio than the one you have set:



Conversely, a smaller/harder knee doesn't compress anything until that threshold has been breached:



The incentive to use a softer knee is that it creates a more gradual and therefore transparent compression in affecting more of your signal with a gentler ratio. This is in contrast of a hard knee which has more of an all or nothing effect.

Attack: The attack of a compressor is an important setting which determines how quickly compression begins after the signal exceeds the threshold.

We generally want SOME attack every time we set our compressor to delay that compression by just a few milliseconds.

Why delay compression like this?

Even that small gap is enough to allow the transients, or the initial high frequencies of a track, to cut through the mix at full volume before the compressor clamps down.

Transients help bring the listener's attention to the track and keep it present in the mix.

They're what make a mix punchy, so a little attack is essential for keeping some life in your compressed tracks.

Be careful, though, as setting the attack too slow, meaning delaying the compression too much, will allow you to hear a clear division between the full volume and the transition to pulling it down. Awkward.

Release: The compressor release determines how fast the compression lets go and returns the audio to its uncompressed state once the level drops below the threshold.

Like the attack, this is also measured in milliseconds.

You want some time to ease off of that compression to keep it transparent, meaning unnoticeable to the listener.

When in doubt, most compressors have an automatic release option which reacts to the dynamics more... reactively, easing off more quickly or slowly depending on the audio.

Hold: The other setting which affects how fast the compression lets up is the hold setting.

Unlike release which eases up the compression in the time that you set, the hold time (also measured in

milliseconds) preempts the release time and keeps the full amount of compression on for the duration that you set AFTER the level drops below the threshold.

Adding a bit of hold time is sometimes useful when we need a little extra time of that effect at full force before the release kicks in.

Look Ahead: The look ahead setting internally creates a duplicate of the track you're compressing and moves it earlier by a few milliseconds, using that earlier duplicate via internal sidechaining as the threshold to compress your track by.

The result is the compression settings will be applied to your audio by however many milliseconds you set before they normally would.

This allows you to compress the fastest transients which even an instant attack setting can't catch, like a kick drum, snare drum, or cymbals.

Look ahead adds a bit of latency which your CPU compensates for, adding a slight bit more taxation on your CPU (see my tips for reducing CPU load when mixing).

Look ahead typically isn't necessary in most compression as the goal in is oftentimes to maintain transients because they help those tracks cut through and add to a punchy, desirable mix.

Look ahead is mostly useful when you want to attenuate those initial peaks. A few examples include (some cases of) parallel compression and or limiting, as well as de-essing the unwanted sibilant transients out of vocals.

Range: The compressor's range essentially puts a cap on how much gain reduction the compressor can create, regardless of other settings.

If you set this to -6dB, this means that even if you've dropped the threshold to essentially compress the entire

signal and turn the ratio up to infinite, it will still only turn it down by 6dB.

Gain: Compression turns down the overall volume of your track by reducing the volume of its peaks.

To compensate for this gain reduction, we need to turn the output gain knob up to makeup for this.

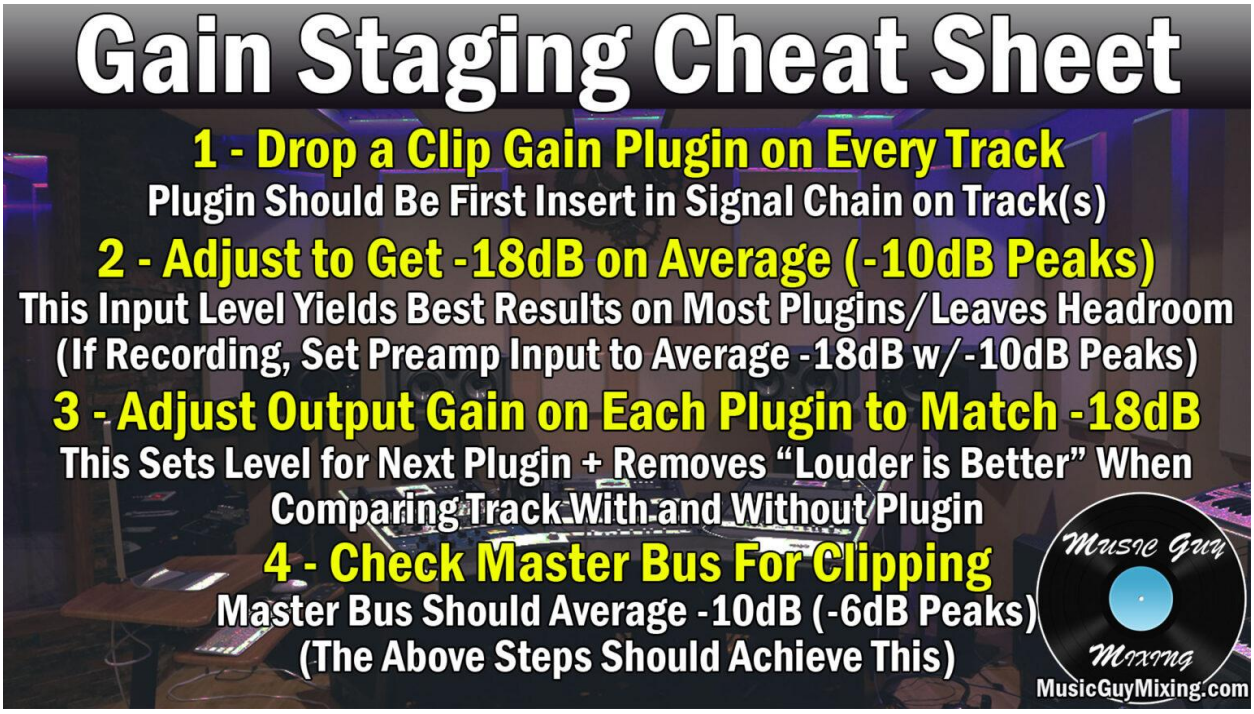
On some compressors, this is literally called makeup gain.

You can set this manually just using your ears, or most compressors have an automatic makeup gain setting which attempts to automatically add in the necessary gain so that the output level is more or less equivalent to the input.

It's important to have the same level going out as you had coming in so that your track stays where it's meant to level-wise in the context of the mix.

It’s also important because it maintains gain staging in your signal chain, feeding the best volume into each subsequent plugin, not to mention it keeps your entire mix at a healthy level and maintains mixing headroom.

I put together an entire gain staging cheat sheet. While I’ll include it here, you can refer to that linked to tutorial for more information on it:



Types of Compressors

Not every compressor is built the same.

There are four types of compressors which you should be aware of.

FET Compressor

Let's start with the FET or Field Effect Transistor compressor.

FET compressors use transistors to reduce gain and add some coloring to the compressed audio. In fact, a lot of producers use the plugin in their signal chain without applying any actual compression, just to get its warmth.

The most famous example of a FET compressor is the 1967 Universal Audio 1176 which a lot of FET compressors mimic today.

It offers a fairly straightforward interface in an input to set your threshold, a few preset ratio buttons, and attack and release knobs to set practically instant timings. There's also an output knob as well as a dry/wet dial.

When to Use a FET Compressor

A FET compressor is great on guitars, drums, and vocals. In particular it works really well to tame peaks.

As an example, I like to put one at the start of my signal chain on vocals with a ratio of 4:1 (the bottom button) to get roughly 5 db or so of gain reduction with a relatively fast attack and release time. Note that unlike most compressors, the higher numbers denote faster attack and release times.

From there you just adjust the output accordingly.

Most FET compressors feature the infamous “All” button above the lower ratio amounts. This results in an overdriven, almost saturation like effect on audio with a slower attack to let some transients through. This setting sounds great when used as parallel compression on a drum bus.

Here’s an overview on how to use an 1176 compressor:

The main thing to understand is again that the attack and release work contrary to most compressors and the higher number equates to a faster/shorter time.

Otherwise you're typically safe with a ratio of 4 or 8, depending on the type of instrument which we'll cover later.

Best FET Compressor

I find myself bouncing back and forth between two 1176 inspired FET compressors in particular:

Arturia Comp FET-76 – This FET is modeled after the 1176 and has all of the relevant settings along with an attractive interface.

Waves CLA-76 – Waves' FET compressor is also modeled after the famed UA 1176. It was built with input from famed producer Chris Lord-Alge and as such has a number of his presets and other well known producers' presets to help you dial in the sound you want fast.

Optical Compressor

Optical compressors, also known as “opto compressors” for short literally generate light based on the input level of the signal. It uses the intensity of this light to determine how much to compress the signal.

More input signal means a brighter light which means more compression.

Optical compressors typically feature the most straightforward interfaces with the fewest options, making it hard to screw them up and easy to get the results you want:

As you can see above, there's no set controls for the attack or release unlike on most any other type of compressor. This is because the attack and release are tied to and vary based on the amount of signal you're feeding into the compressor.

The "knee" is gradual and as such the compression is much more transparent with an optical compressor.

Moreover and by virtue of how the opto compressor works, there's not much in the way of "coloring" the tone like you get with tube or even transistor based compressors.

When to Use an Optical Compressor

Optical compressors work especially well on vocals in particular because they're so effective in creating that extra bit of glue or constant presence in a vocal without hearing the compressor working (which goes back to its transparency).

As such I like to put one or even two in my vocal chain at different points to smooth out the signal after I've introduced a FET compressor to grab the peaks before them.

Best Optical Compressor

Waves CLA-2A – The optical compressor I find myself reaching for the most is the CLA-2A from Waves. It's got a clean and simple interface, and once again like with the CLA-76, it's got a handful of helpful presets for finding the sweet spot to compress your signal with fast.

VCA Compressor

VCA, or Voltage Controlled Amplifier compressors offer fast, low distortion, and transparent compression.

They are similar to optical compressors in that they won't color your audio much. At the same time though they can operate much faster, making them effective for taming peaks on individual tracks or busses without altering the sonic quality of your audio.

When to Use a VCA Compressor

I particularly like to use a VCA compressor on busses, including my master bus, when I want a bit of glue/cohesion just to tie everything together.

Glue compression is actually a term and can be that final missing piece to bring your bus or even mix together.

In virtually every mix of mine, my drum bus in particular has one of these at the end of the chain.

Don't limit your usage of a VCA style compressor to this, but I find they especially excel in that role.

Best VCA Compressor

Waves SSL G Master Bus Compressor – When I need a bit of bus glue, I like the Waves SSL to tie things together. Based on the SSL 4000 G console and as the name suggests, this is great at or near the end of your master bus chain to provide that extra bit of unity to a mix that needs a touch more control and impact.

Vari Mu Compressor

A Vari Mu compressor, also known as a variable mu compressor, is amongst the oldest forms of compression and is based on tubes. As such, a Vari Mu compressor imparts that warm and saturation sound of tubes to whatever you apply this compressor to.

Vari mu compressors work much slower than the snappier compressors I covered earlier. These aren't form taming peaks but rather to soften a less dynamic track, bus, or even the master bus and bring some color to it at the same time.

When to Use a Vari Mu Compressor

As mentioned, variable mu compressors are slower, tube based compressors. They are best served when applied to more macro levels of your mix.

As such, try using one as a finishing touch on say a drum bus, vocal bus, or even the master fader itself.

While you're sacrificing a little in the way of dynamics, you're creating a more consistent, glued together sound in that track or bus (while giving it a bit of signature tube warmth).

Best Vari Mu Compressor

Waves PuigChild Compressor – The Fairchild 670 was the gold standard in its day and current Vari Mu compressors are STILL modeled after it. I typically reach for Waves' PuigChild Compressor when I want some glue on my master bus. Sometimes I compare the results with the SSL G Master Buss Compressor and take the winner.

Compression Techniques

Now let's talk about a couple few compression techniques/terms/etc. which I'll likely reference at some point if I haven't already.

Parallel Compression

We begin with parallel compression.

Parallel compression is the technique of creating a duplicate of a track in your mix, dropping a compressor on that duplicate, and setting an extreme threshold and ratio.

That duplicate becomes a fat blob of overly compressed sound full of energy and devoid of dynamics. That parallel compressed track is then mixed in alongside the original dry version of the track to taste.

This technique adds thickness, energy, and presence to any lacking track in your mix.

Also known as “New York Compression”, this style of compression was heavily used amongst and became associated with engineers in New York City in the 90’s.

How much you blend in of the parallel signal is entirely up to you. You can mix it lower to where it’s more felt than heard, or you can turn it up a bit more so that it’s more noticeable when removed.

How to Use Parallel Compression

There are a few ways to use parallel compression. First, you should decide how you want to integrate it into your mix.

As a Duplicate Insert

A common use of parallel compression is to duplicate the track you want the effect on then dropping a compressor last on the signal chain. You can remove all of the effects on the duplicated track before the compressor to just parallel compress the raw audio or conversely you can leave them on for a more perfect duplicate.

In some DAWs like my Ableton Live, you can create a separate instance of the audio to process differently but on the same track.

In Live, you simply drop an “Audio Effect Rack” on the track then right click and select “Create Chain” to effectively add a second instance of that audio on the same track. You can then drop a parallel compressor on one of the two chains and treat the chain volume as the fader to blend to taste.

As Wet/Dry Insert

Another method is to use the wet/dry knob(s) on the compressor to blend your compressed and dry signals together to taste.

This works best when the plugin has separate knobs for the wet and dry signal like the FabFilter Pro-C. This gives you full control over the mix between the two, leaving the dry signal untouched.

You can adjust the parallel compression settings as you like, then keep the dry signal knob at its normal volume, blending in a bit of the compressed signal with the wet knob as desired.

As an Aux Track

A nice way to use parallel compression (and the way I typically use it) is as an aux/return track in your DAW. This way you can just have one instance of your parallel compressor in your mix and blend in the desired amount as a send as you go from track to track.

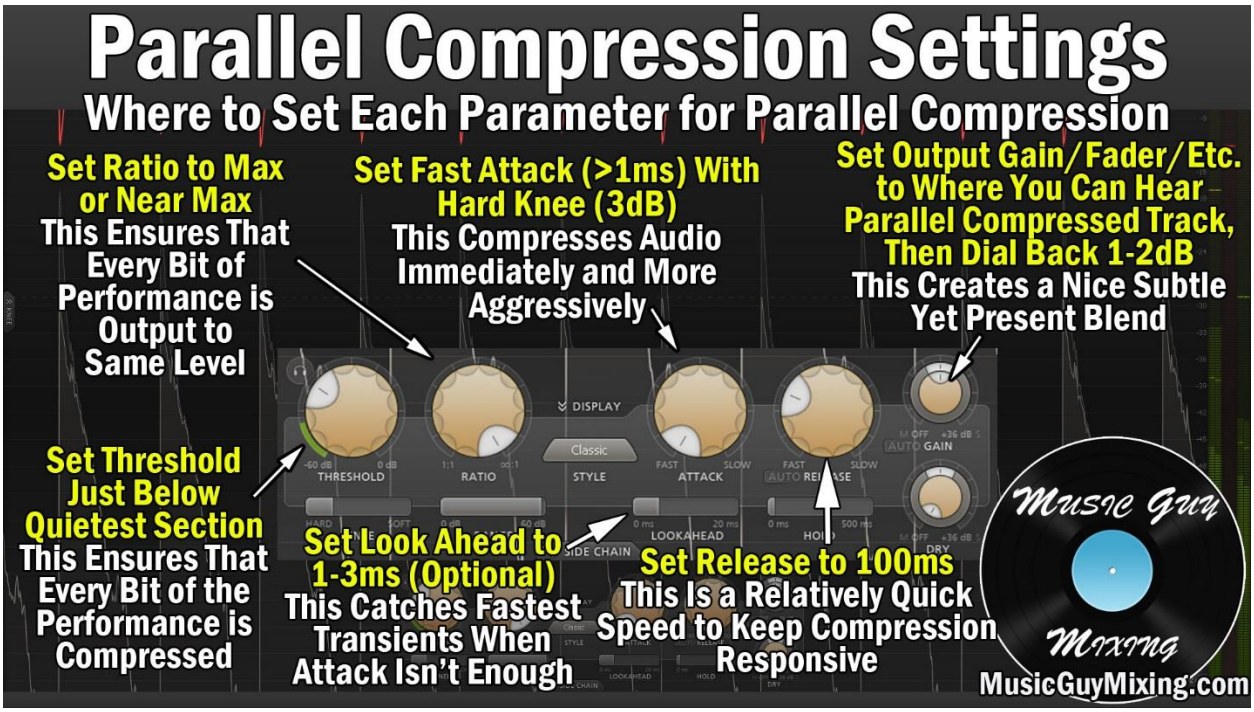
Having one instance of parallel compression you can blend in as a send on each track saves time and processing power.

To do this, simply create an aux/return track and drop a compressor on it.

No matter your workflow for adding it, let's talk about the parallel compression settings to use to get the effect you want.

Parallel Compression Settings

Now it's time to adjust the extreme parallel compression settings, the ones which make it ideal for this technique. Namely I'm talking threshold, ratio, attack, and release.



Essentially you want to include everything in the threshold, max out the ratio, and set an instant attack time with a mid-level release.

Make sure the dry signal is off so you're only hearing the wet compressed blob on this track, then simply blend in the parallel compressed signal to taste.

Maybe you want to be able to hear it easily to really add that thickness, maybe you just want it to be felt in the background. The choice is yours.

What to Use Parallel Compression On

You can use parallel compression to beef up any track in your mix which you feel is missing that intangible. A few good applications include:

Vocals

If a vocal is feeling a bit weak even after you've compressed it (see my best compressor settings for vocals), try blending in some parallel compression.

The parallel instance of the audio emphasizes every single syllable, so it brings a little extra cohesion and energy even when faintly mixed in.

Drums

Parallel compression works well in an individual drum track to get more sustain out of a snare, a kick, or it can be applied to the entire kit to add more energy.

You can even solo the parallel compressed drum track as a whole to get an interesting and raucous aesthetic for a bridge or one off section of your mix.

Buses

I just mentioned applying parallel compression to your entire drum kit, but you can use it effectively on most buses in your mix.

This creates a thick, heavily glued together mixture of every track playing on the bus at once. It can beef up an entire instrument group when used effectively.

Master Bus

Getting as macro as possible, we can even blend in some parallel compression on our master bus itself. When the

finished mix feels like it could use a little extra “oomph”, use the audio effect rack method to create a parallel instance of your entire mix, crush it with parallel compression, then blend in as you like.

As with any processing on the master bus, less is more, so blend conservatively.

Serial Compression

Serial compression is a technique used by mixing engineers all over.

It involves using two or more compressors on the same track typically one after another to compress your signal.

Why use more than one compressor? By splitting the workload between two compressors, you get more transparent results so you don’t hear the compressors working but you get the effect you want.

Each compressor can treat the audio dynamics differently and works toward a specific purpose.

I oftentimes like using two compressors in a row to get better control over the signal, particularly on more dynamic tracks like vocals.

How to Use Serial Compression

The first compressor in serial compression is usually an 1176 modeling FET style compressor to tame the peaks and compress the dynamic range. This can handle a heavier workload than what we're using next in the chain.

As such, the settings are more aggressive because I'm trying to get a more even signal achieve more cohesion and energy in that track:

A FET style compressor like I just covered like the Waves CLA-76 or the Arturia Comp FET-76 works well here for getting a handle on tracks with a lot of dynamic range like bass or vocals.

Because we're using serial compression with another compressor next in the chain, we don't have to run this TOO hard.

I'm looking for gain reduction of about 5 to 10dB or so on the loudest peaks.

This sets things up nicely for our second compressor. I'll usually reach for an optical/opto compressor here. You generally don't run these compressors quite as hard and they yield very transparent results.

I like the CLA-2A from Waves as a simple opto style compressor. Just set the input (peak reduction on the right) for how much gain reduction you want, and your makeup gain with the gain dial on the left.

Here I'm just looking for a bit of glue to my already compressed signal, maybe 3dB of gain reduction at most on the peaks here to smooth it out just a touch more:

After my second compressor, I'll typically insert any other processing the track calls for.

When all is said and done, I might put one final compressor at the end, typically another opto or a VCA, of the chain to add one final touch of glue after any additional processing.

That's basically how serial compression works. Hit those peaks hard on your first compressor, then ease things up to glue the remainder together.

This gives you an effectively and consistently compressed signal without the artifacts that you'd get if you had to run just one compressor harder to do both jobs.

Sidechain Compression

Sidechain compression refers to compressing one track based on the behavior of another track.

This is useful when you want to duck out, or lower the volume, of one track for a split second so another track can more easily cut through the mix.

The most practical example of this is sidechain compressing bass to the kick drum.

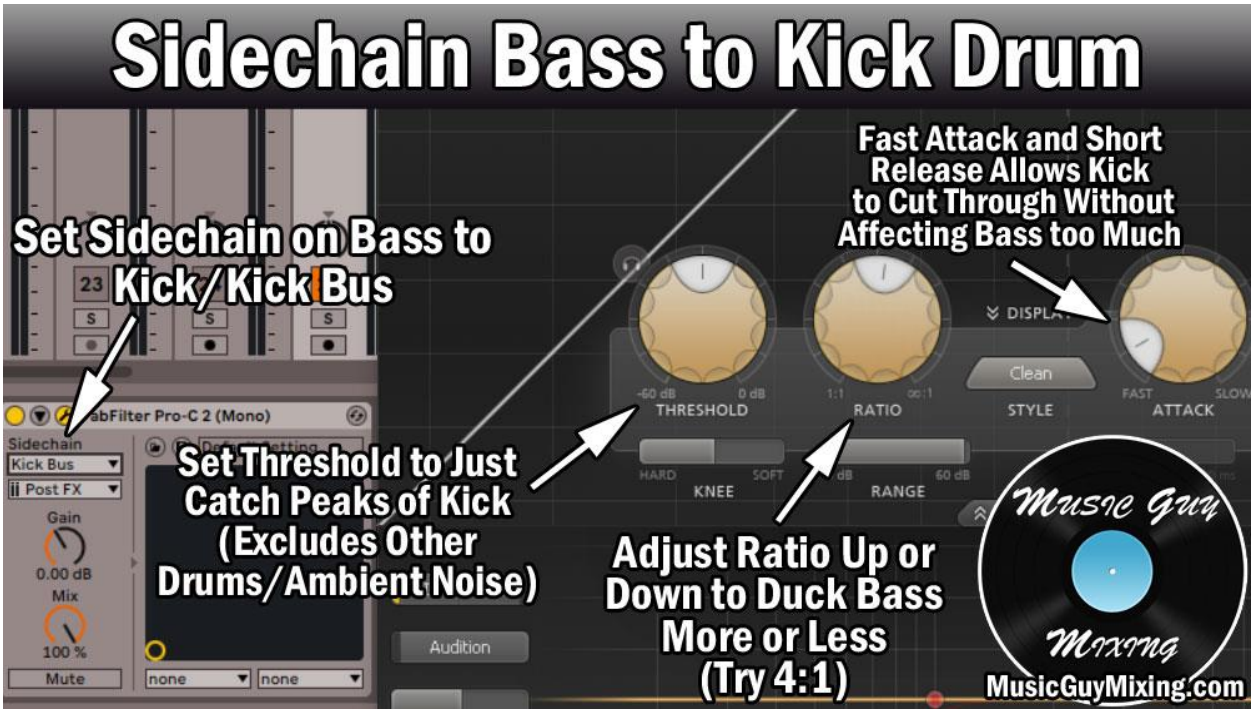
As I explained in my low end mixing tutorial, the kick and bass share a similar fundamental frequency range, between roughly 70-120Hz.

This creates a conflict, and this problem is compounded by the fact that both of these instruments are ideally "panned" right in the center of the mix.

To help give the kick the space it needs in the mix, we can compress the bass whenever the kick triggers. This momentarily (for a split second) pulls the bass down so the kick has complete dominion over the low end of the mix whenever it plays.

To sidechain, you simply drop the compressor on the track you want to compress (in this case our bass track), and specify the track you want to sidechain it to (in this case our kick track).

From there you set the threshold to catch the quietest instances of the kick to ensure that every kick engages the compression on the bass:



You'll find the sidechain option in different spots depending on the compressor. In Ableton Live's stock compressor, there's a sidechain button on the top left as I explained in my guide to [Ableton sidechain compression](#).

This allows you to select which track you want to dictate the behavior of the sidechain compressor ("Audio From").

You also need to select pre or post FX. This determines at what stage in the "Audio From" track's signal chain that you want to pull the audio from to affect the threshold of the compressor.

"Post FX" means that it takes the level of the audio after all processing in the signal chain, whereas "Pre FX" takes the level of the raw audio, before any plugins have altered it.

Regarding the rest of the settings, with sidechain compression, you set your compressor up like you normally would, just bearing in mind that the threshold's behavior is being affected by the other track rather than the one the compressor is on.

Ultimately sidechain compression is another tool in our belts when we need to get two or more tracks which are

conflicting with one another to work together, or just get some fun and interesting results with a more dynamic compression.

Upward Compression

When we talk about compression, 99% of the time we're talking about downward compression, or taking the loudest parts of a piece of audio and pulling them down as they cross the compressor's threshold.

Still, there are rare times when the problem is the reverse: the quietest parts need to come up without affecting the louder bits. Enter upward compression.

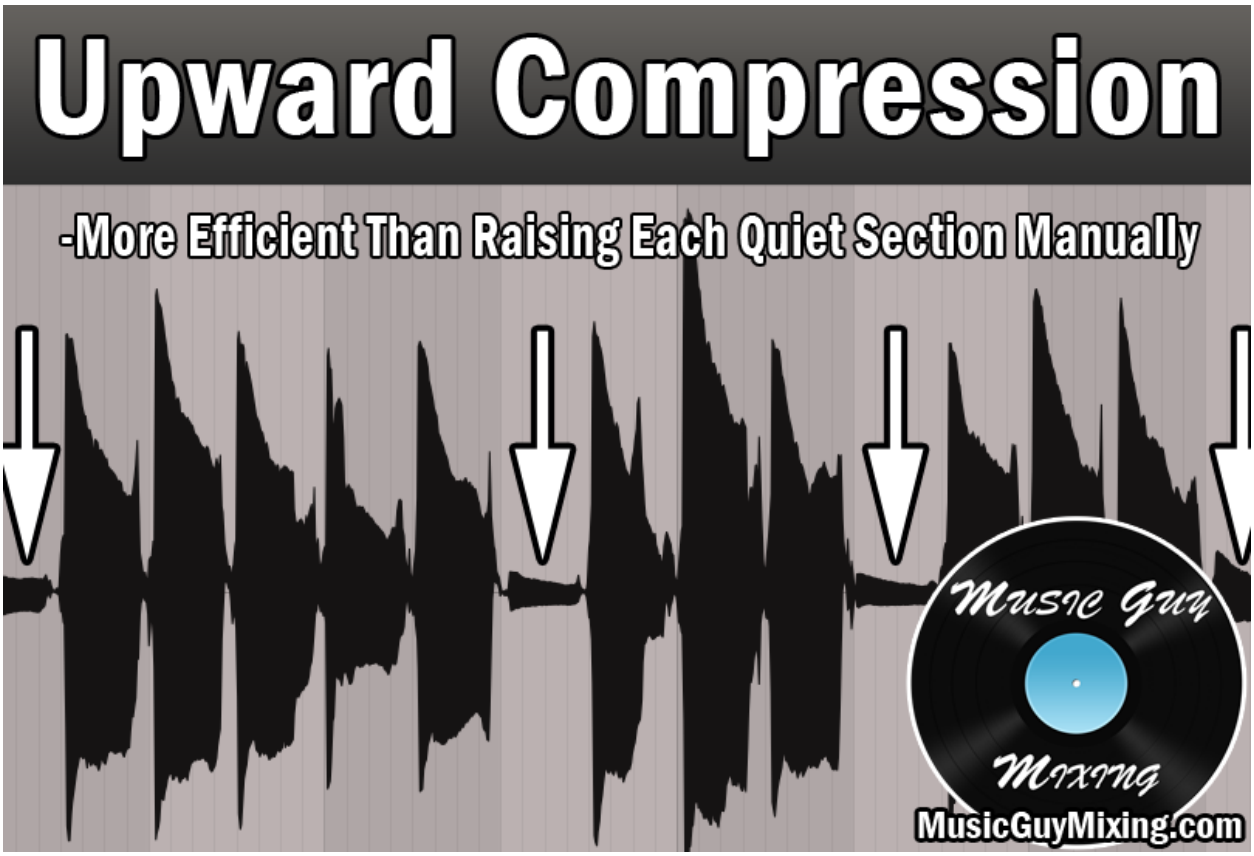
Upward compression is pretty straightforward in theory. Instead of bringing down the loudest peaks in your audio, you're bringing UP the quietest nadirs in a wave form.

No gain reduction is necessary, but we're still technically compressing the audio by reducing the dynamic range.

Upward compression still uses a threshold like a regular compressor, but here the threshold is designed to bring up everything BELOW a certain point.

When to Use Upward Compression

Maybe a better way to explain upward compression is to demonstrate WHEN you might want to use it (with a graphic):



As the above image shows, most of the “sections” of audio here are roughly the same volume. We have that one section which is much quieter, making this whole piece of audio a bit too dynamic overall.

Because most of the audio here is at a good level, so it doesn’t make sense to apply a conventional downward compressor here to squish roughly 90% of the audio just to make them closer to that one quiet bit.

Instead we can use upward compression and set a threshold to only target and catch the quiet stretches and bring them up.

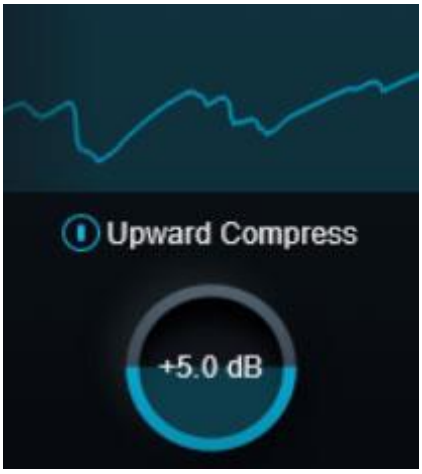
Upward Compression in Mastering

I arguably use upward compression most often in the audio mastering process at MusicGuyMastering.com.

It’s incredibly useful when you get a completed mix which has too much dynamic range (too a fault). Rather than crushing those peaks, sometimes it’s far more

transparent to simply do what should have been done in the mixing process and bring up those quieter parts.

Because I don't have access to the tracks, I simply drop a plugin with upwards compression like Izotope Ozone's Maximizer and set the upward compression amount as necessary:



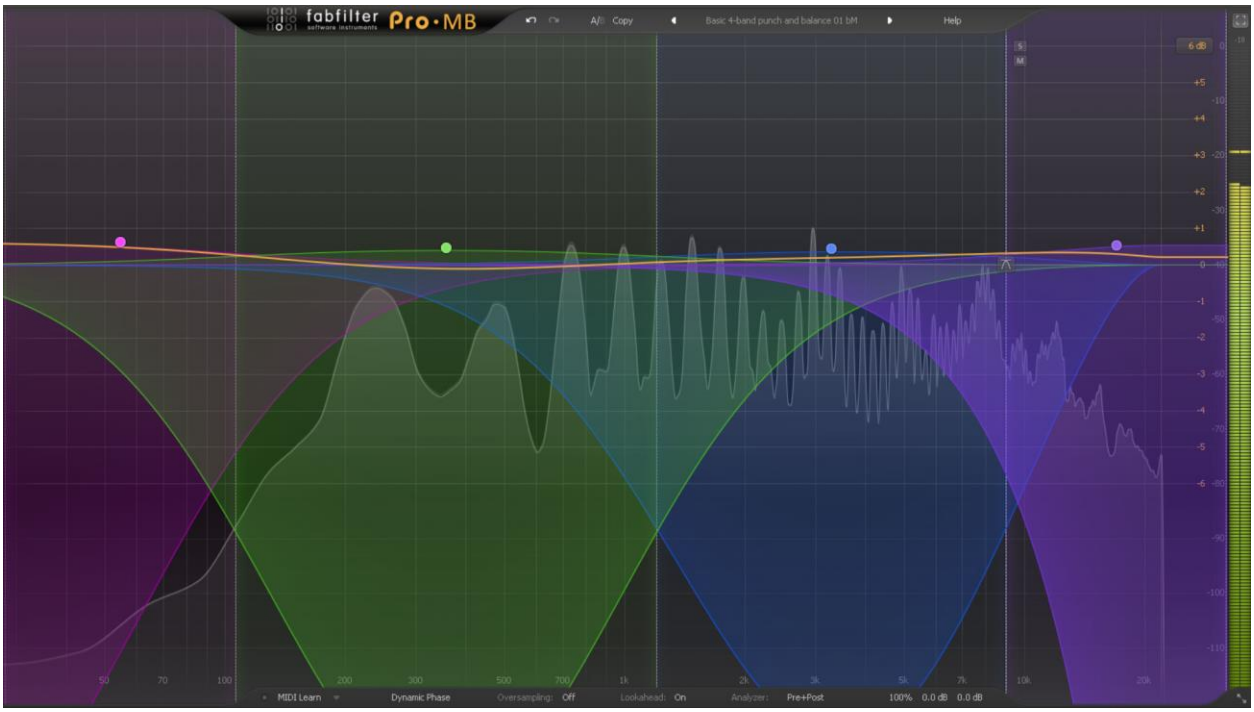
Setting this to 5dB brings up the quietest parts by 5dB and the basically everything up to 5dB above that at a relatively small amount.

This still is technically compressing the dynamic range by shrinking the difference between the quietest and loudest points, but no gain reduction is applied.

Multiband Compression

This Compression Cheat Sheet focuses on using single band, or conventional, compressors on your audio.

It's still worth acknowledging multiband compression – a special form of compression which allows you to isolate or only compress particular frequencies of your audio:

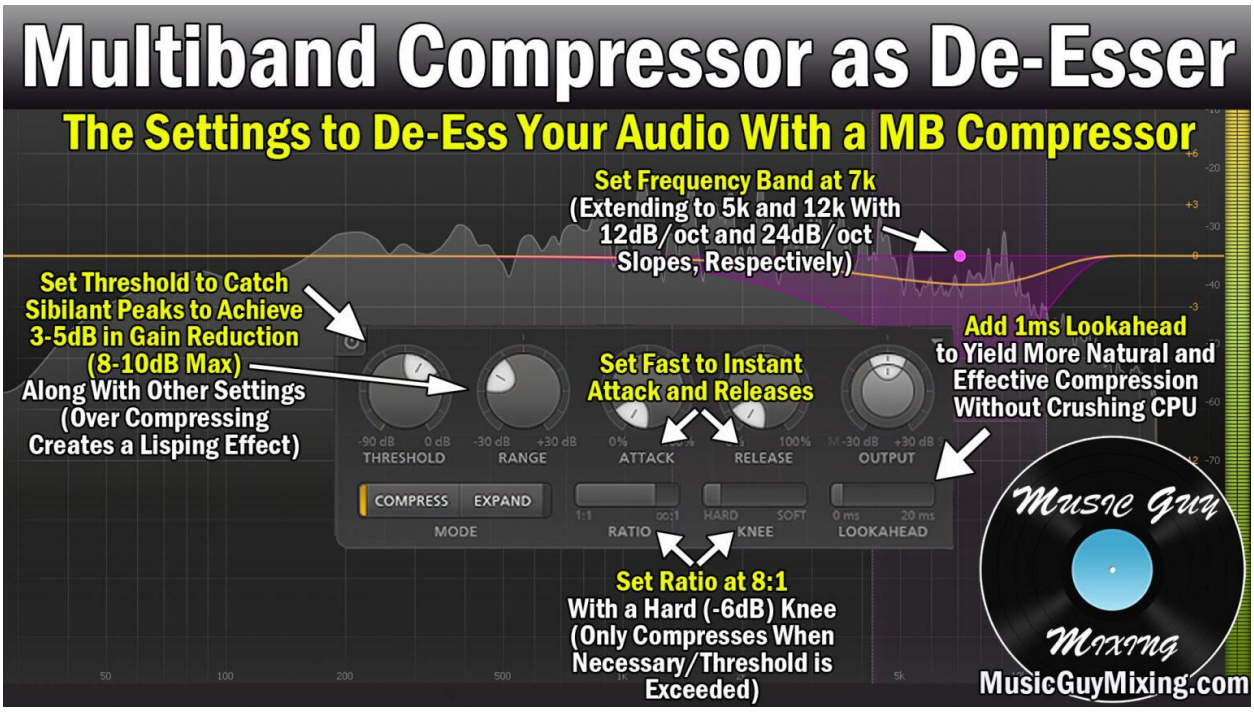


Multiband compression is useful when you want to attenuate (or even boost) certain frequencies of a track while leaving the rest untouched.

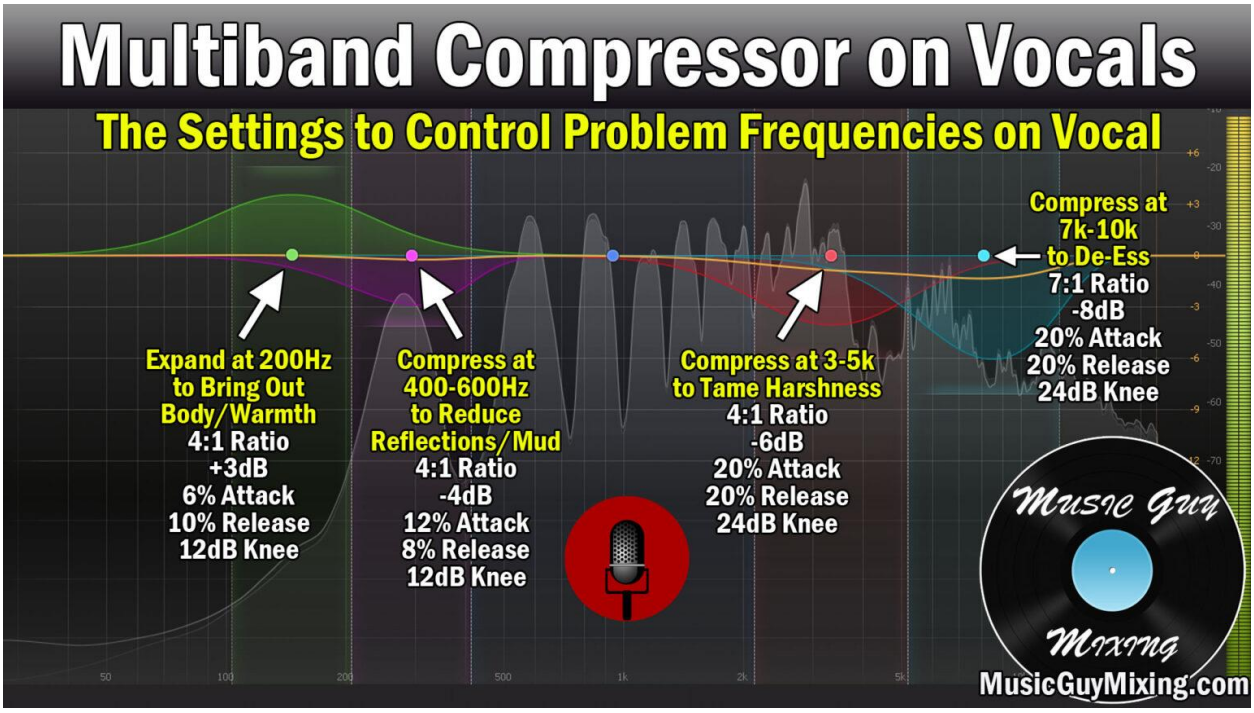
A prime example of a practical application of multiband compression is in attenuating vocal sibilance (the annoying exageration of “S” sounds in particular which pops up in the 7-11k frequency range).

In fact, a de-esser (a plugin designed to smooth out sibilance) is essentially just a multiband compressor.

I even did an overview of how to turn a multiband compressor into a de-esser:



I also did an entire overview on how to use multiband compression on vocals, largely showing how to smooth out problem frequencies:



It's important to remember that, assuming you've already properly EQ'd every track in your mix before compression, you shouldn't have TOO many problem frequencies which need to be isolated and attenuated via a multiband compressor.

Here's one more reminder to grab my EQ Cheat Sheet for free to ensure that you're sending only the good stuff to your compressor.

Still, multiband compression has its place in your mix now and then, so check out all of my tutorials on multiband compression.

Limiters

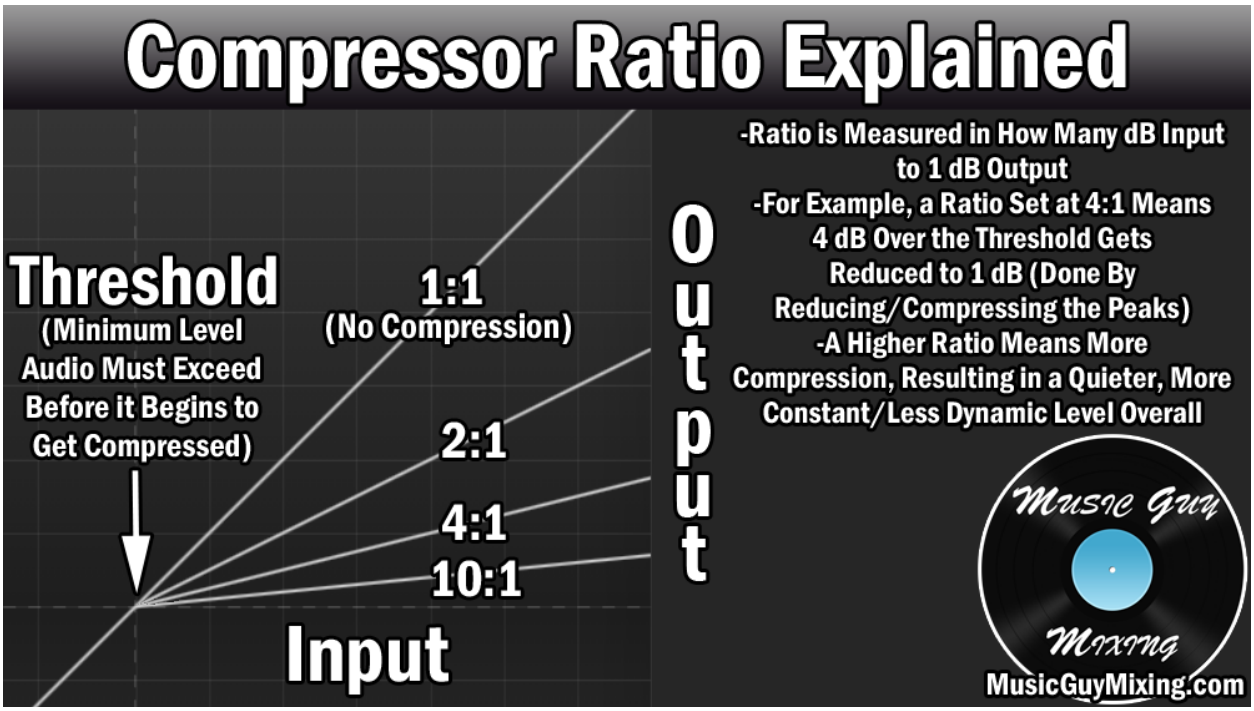
We can't talk about compression without giving a nod to limiters.

Limiting is just another form of compression, albeit to an extreme.

The difference between a conventional compressor and a limiter is that on a limiter the ratio is essentially infinite.

Whereas a typical compressor ratio would be set somewhere between 2:1 and 8:1 in order to turn down anything which exceeds the threshold by a varying amount of decibels, with a limiter's infinite ratio, anything which exceeds that threshold gets output at the exact same volume. The threshold essentially becomes a flat ceiling which no peak can pass.

You can see this in action once again in my graphic on demonstrating how the compressor's ratio works:



The higher that ratio goes, the closer the output flattens out. Feeding different levels into a compressor at lower ratios will output different volumes.

If we turn that ratio all the way up, that's when it becomes a limiter. At that point, it doesn't matter if our track's level would exceed our threshold by 1dB or 100dB – it's all getting compressed and output at the exact same volume, hitting that ceiling.

Why would we want to do this? Let's move on to cover how to use a limiter in your mix to explain this.

How to Use a Limiter in Your Mix

Limiters have a number of applications, but they mostly boil down to two major purposes.

The first and the one which we typically associate with limiting is in the audio mastering stage.

Mastering engineers use limiters or maximizers at the end of the signal chain to turn up the volume as much as possible while avoiding audio clipping.

This gets your completed song to a competitive and comparable volume with other commercial masters so that your song doesn't sound quieter/weaker than the songs around it in a mix on a streaming service (for example).

There’s no point in using a limiter in the mixing stage, at least driving it to the point of gain reduction. In the mixing stage, we want to practice gain staging to get the most out of our audio and maintain some headroom for the mastering stage. If you want your mix to be louder while you’re mixing, simply turn up your speakers or headphones.

The second major purpose which limiters have, and the one which is applicable to the mixing stage, is as a form of extreme compression.

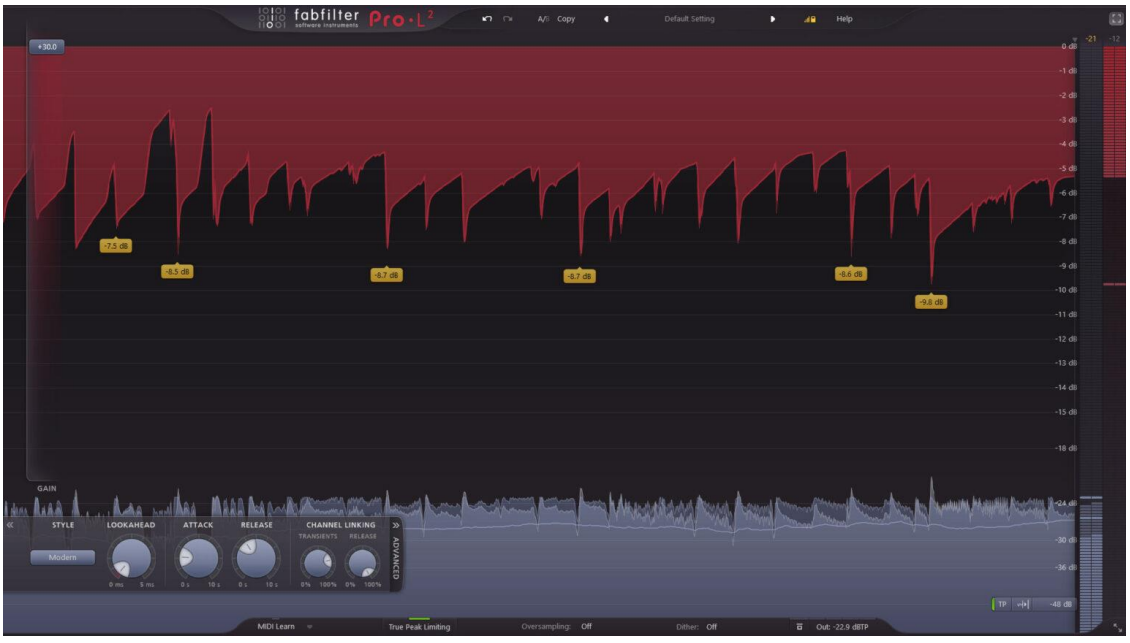
Sometimes you’re willing to sacrifice dynamic range to get a constant volume out of your audio.

The bass is a prime example. As you’ll see in the compression cheat sheet section (which we’re ALMOST to), the bass is one of the more dynamic instruments. Even with compression, some notes will typically be a lot louder than others while some will still be lost altogether.

Simultaneously representing the key of the song and providing a major part of a song's backbone, we want that bass to be ever-present in the mix.

While that's a more natural way to get more cohesion out of the audio, sometimes your bass guitar or bass in general can benefit from the infinite ratio associated with limiters.

Here I have an especially dynamic bass part, alternating between octave notes with a complex rhythm. With the limiter I'm turning the gain which is essentially the threshold on the limiter up so that I'm crushing that input:



I kept about 20ms of attack to let those transient peaks surge through before that limiter clamps down.

In this track's case, I actually have the limiter set up after a conventional compressor, so I've got some serial compression going on here.

As such, I've ultimately got a lot more than the 9dB on average of gain reduction happening on this limiter, relative to the raw recorded bass.

Note that I'm still turning the output of the limiter down considerably to match the input level to maintain our gain staging.

Raising the volume obviously isn't the goal here, we just want a relatively dynamic-free sausage clip of audio to keep that bass present every second of the performance.

You can see there's still a couple dB difference between the gain reduction on those peaks. If I wanted the level

to be even more constant, I'd add one more limiter after this one in the chain.

This sacrifices those dynamics, but it keeps that bass front and center – a technique you'll hear a lot on pop records.

I just use bass as an example – you can use a limiter or limiters on a number of tracks you want up front in the mix.

Vocals are an obvious choice, particularly in pop where transparency isn't the goal.

A lot of mixing engineers love to use limiters on their kick or snare to ensure every single hit of these two essential ingredients are constant throughout the mix.

Some old school mixing engineers may balk at this with the argument that you're killing the life of the track with the dynamics, but remember – there are no rules.

The only rule in mixing (aside from my evergreen music mixing tips) is that if it sounds good, do it.

OKAY!

Now that we've talked about the different types of compressors and some of the most common compression techniques, let's get into the main focus: the compression cheat sheets for every single instrument!

The Best Compressor

There are thousands of audio compressors which fall into the previously covered categories out there.

There are stock ones which come with your DAW as well as free and premium third party options.

I talked about how FabFilter's Pro-Q is my favorite EQ plugin for its versatility, so it's little surprise that my favorite compressor is their compression equivalent plugin, FabFilter's Pro-C 2:

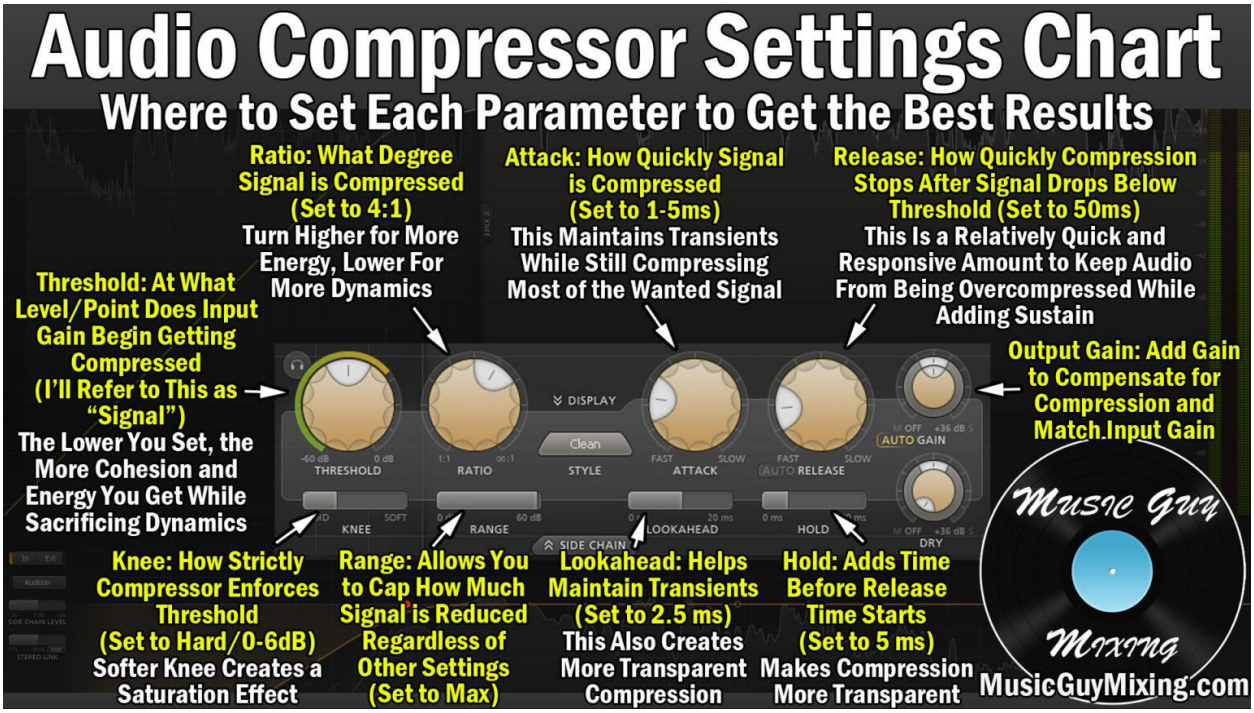
You'll likely recognize this plugin from all of the graphics which I include in this Compression Cheat Sheet, but WHY do I consider FabFilter's Pro-C 2 to be the best after mixing for 15+ years?

It essentially boils down to its versatility.

Pro-C 2 has features and functionality to replace virtually every other compressor in your tool belt, saving you time and money.

Settings

As you can see from the interface above or below, Pro-C 2 has all of the standard audio compressor settings that you'd expect to find on a compressor:



Threshold (with a headphone/audition button to hear just what's being compressed), ratio, knee, range, attack, release (with automatic release), hold, lookahead, gain (with auto makeup), and dry gain (for parallel compression) – they're all easily adjustable via dials or sliders.

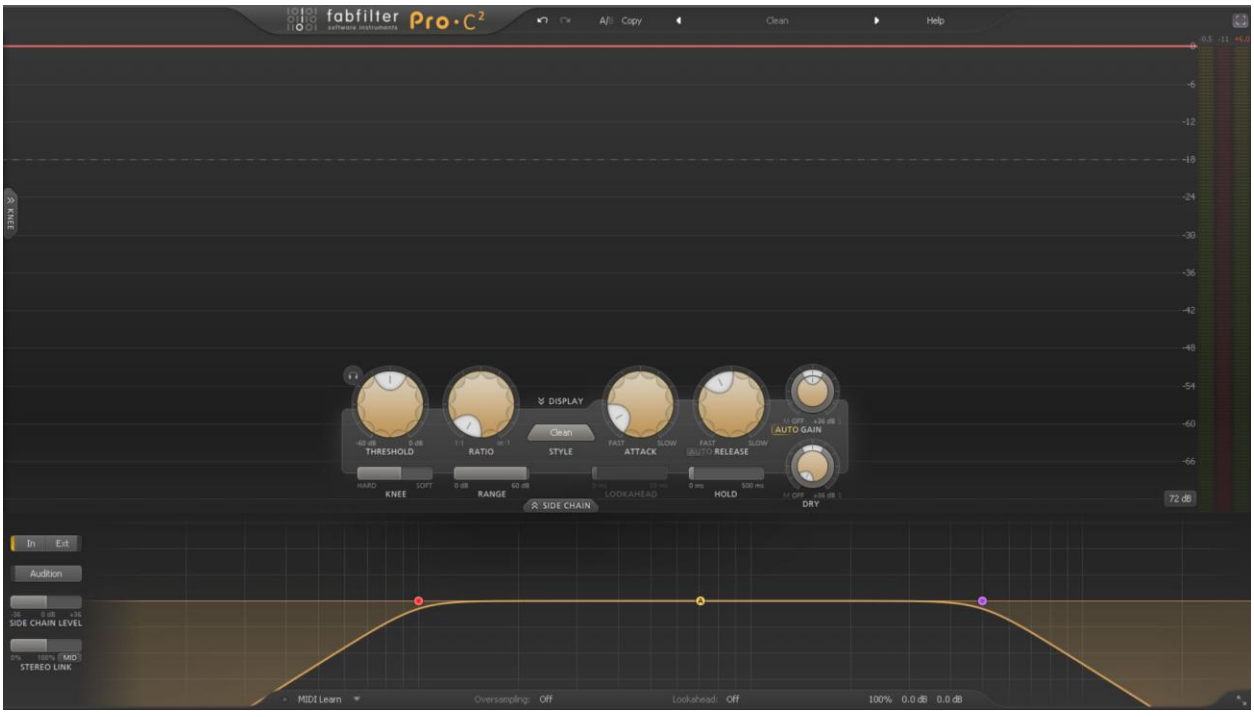
Hovering over any of these settings will give you a brief overview of the setting, how it works, and what it does in relation to your audio. This serves as a handy refresher guide for any settings you might not be straight on as you're mixing.

Sidechain

I’ve talked about sidechain compression a moment ago.

Practically speaking, sidechain compression is useful for getting two tracks which share the same frequency range and the same panning position in the mix, as is the case with the bass and kick drum, to avoid stacking on top of one another and suppressing each other.

Pro-C 2 allows you to sidechain via an external track or even filter out frequencies on the track you’re compressing to guide the threshold, itself:



Setting the parameter to “Ext” allows you to specify the outside track you want guiding the threshold which will affect the rest of the compressor’s settings (see my guide on how to sidechain for more information).

Setting the parameter to “In” will allow you to filter out certain frequencies on the track which you’re compressing.

For instance, if you don’t want any frequencies below 100Hz affecting the compressor’s threshold, you can adjust the displayed high pass filter to filter out those lower frequencies.

Note that the filter options will also apply to an external source, so you can only include certain frequencies to affect the volume for your threshold on that outside track.

You can also limit it to the mid or side channels if you like with the “Stereo Link” slider.

Lastly, you can click the “Audition” button to hear the specific audio which is dictating the threshold after your filter options.

Presets

In taking a glimpse of the presets menu, the drums tab alone has presets for virtually every piece or microphone in your drum setup:

The presets make finding the compression for your particular instrument extremely easy. Sometimes the presets serve as a great jumping off point, other times

they are the exact settings you need to the point that all you need to do is set your threshold.

And of course, once you find the perfect settings, you can save it as one of your own user presets to quickly return to again and again.

Styles

A lot of the secret sauce of Pro-C 2 is its ability to change how the algorithm behind the compressor operates via the “Style”.

The styles menu has 8 options which each change the way the compressor processes your audio:

For instance, the “Vocal” preset actually takes the Ratio and Knee settings off the table, instead opting to use an algorithm to set these automatically so that you just need to focus on setting the compressor threshold to decide how much of the vocal you want to compressor as well as time controls of attack and release times.

You can pick a specific style like “Bus” when you want some glue on one of your buses, or you can leave it with the low distortion and standard “Clean” option when dialing in your settings.

The “Opto” style even replicates the slow, soft knee, linear compression of an Optical compressor (see my overview of the four types of audio compressors) which is also great for vocal compression.

Match the “Mastering” style with a maxed/essentially infinite ratio and you’ve got a transparent limiter which is free of distortion.

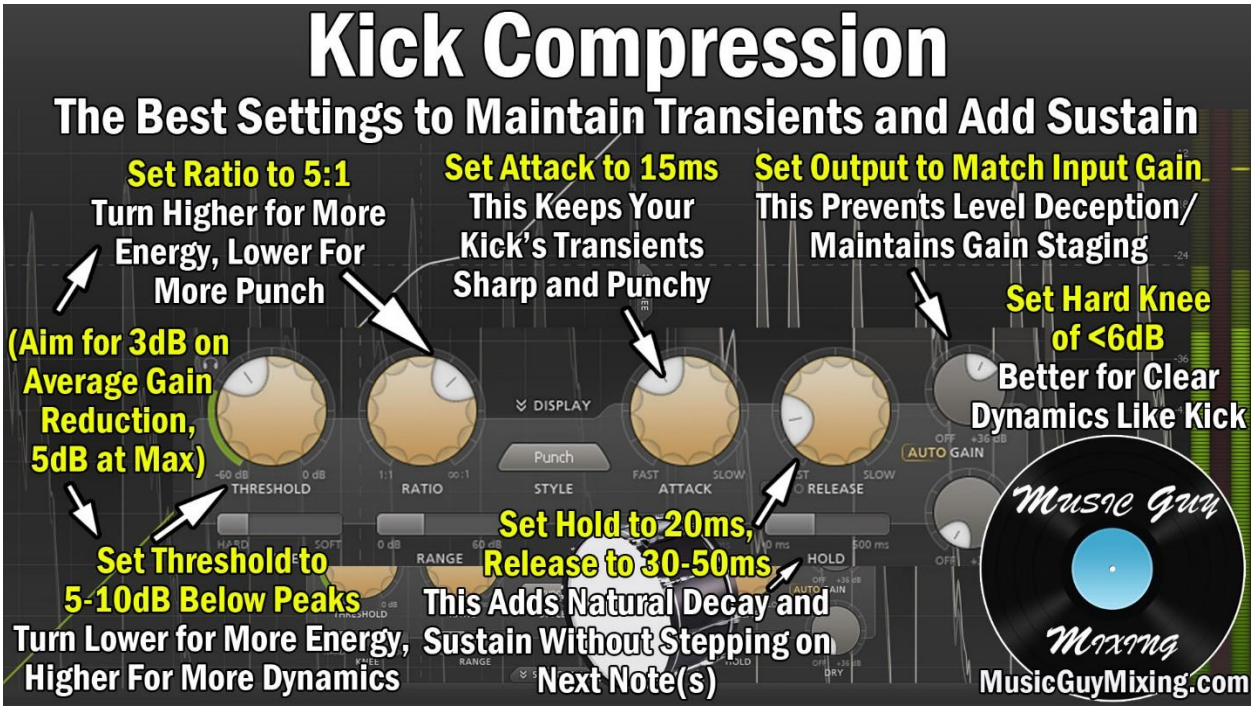
That’s kind of the main point which goes back to why I believe the FabFilter’s Pro-C 2 is the best audio compressor. Whatever kind of compression you want to achieve, this compressor can handle it beautifully.

The interface makes it incredibly simple to quickly dial in the settings you want time and time again.

Compression Cheat Sheet

Here is my compression cheat sheet for all of the most common instruments. I'll cover each one individually in depth on the following pages to explain each setting.

Kick Drum



A well compressed kick drum has added thickness and sustain to better feature it as the anchor and most important element in your mix that it is.

Note that if you need more transient punch on your kick, consider my guide on adding audio transients.

Conversely, if you've got too MUCH punch on your kick and it's needlessly driving up your peaks and reducing headroom, check out my tutorial on using a hard clipper

to manage this and getting a thicker kick through transient cutting.

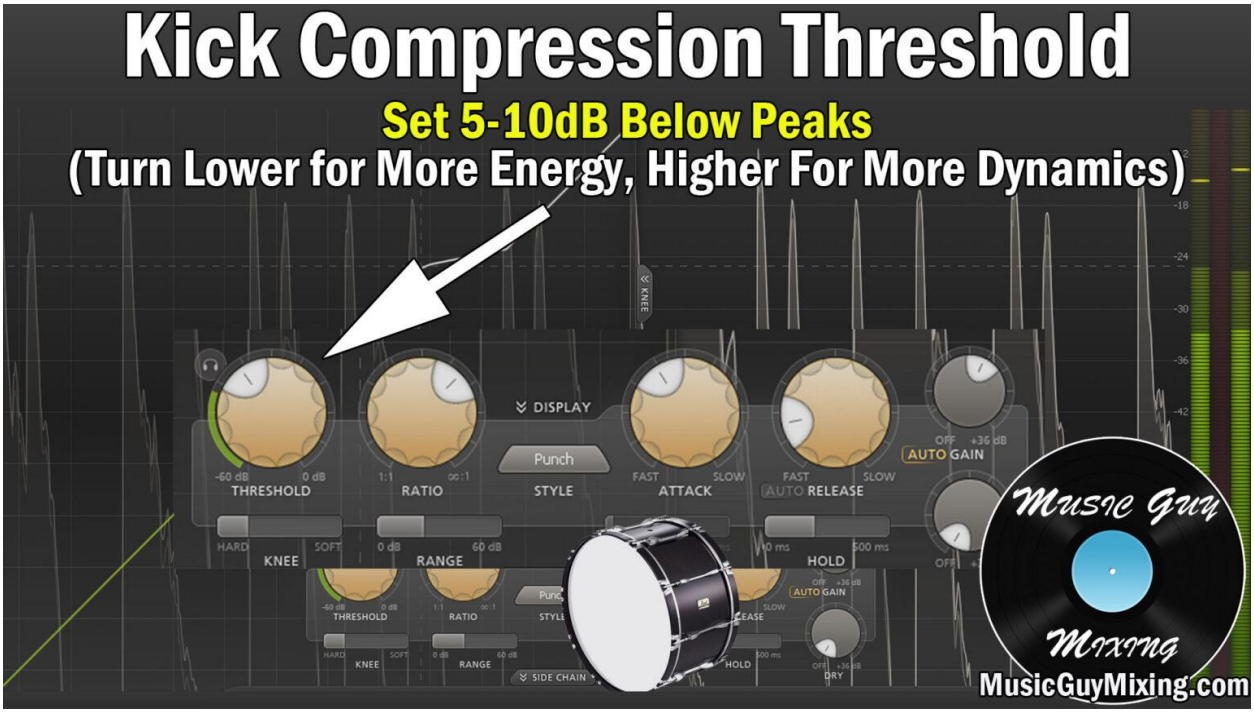
Now let's cover each specific setting for your kick compression, starting with the threshold.

Threshold

Normally when I'm talking compression threshold, my recommended setting is more vague, more aiming for the gain reduction.

With kick compression, the peaks are typically pretty consistent.

As such, I recommend aiming for 5-10dB beneath this peak for the kick threshold.



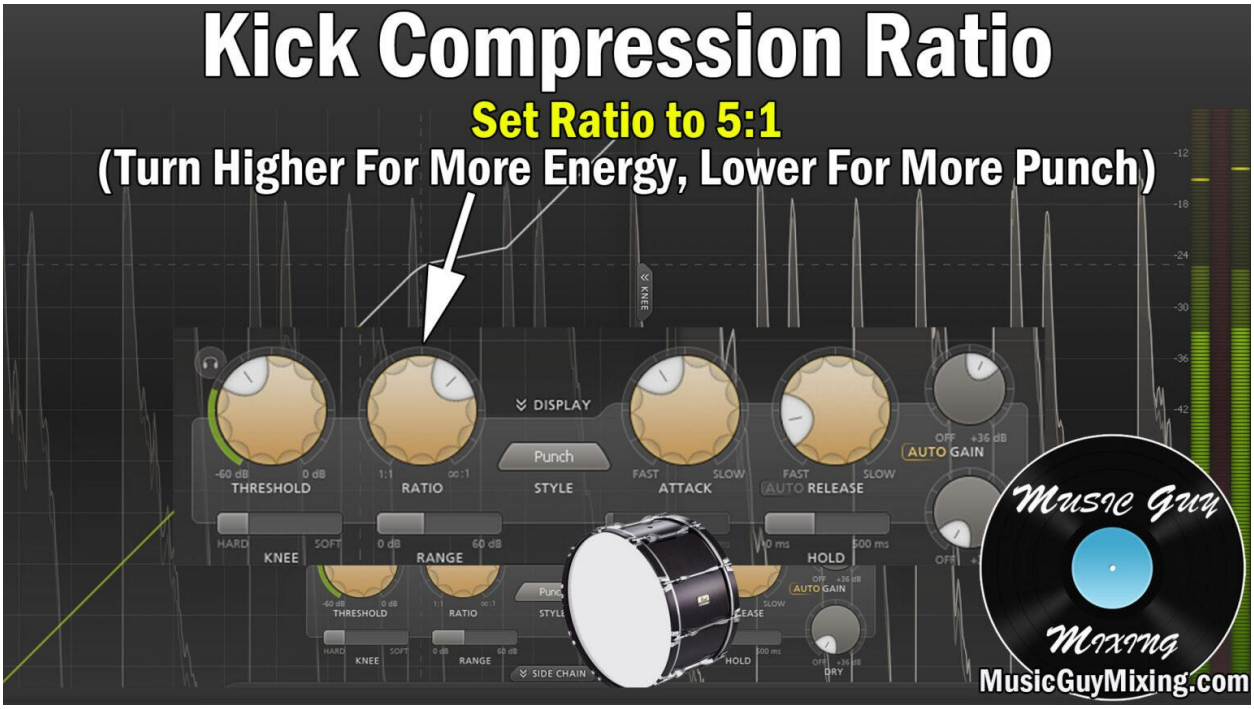
The kick has such clear and clean dynamics, this brings up everything outside of the transients of the peaks to give you a nice boost of sustain.

We'll keep that punch especially with the kick's attack setting in a moment, but this is a good place to aim for your threshold.

Ratio

The compressor ratio determines at what rate the compression is applied.

For the kick compression ratio, I recommend a relatively above average ratio of 5:1.



Combined with a 10dB threshold, this means we're outputting 2dB when the threshold is exceeded by 10dB.

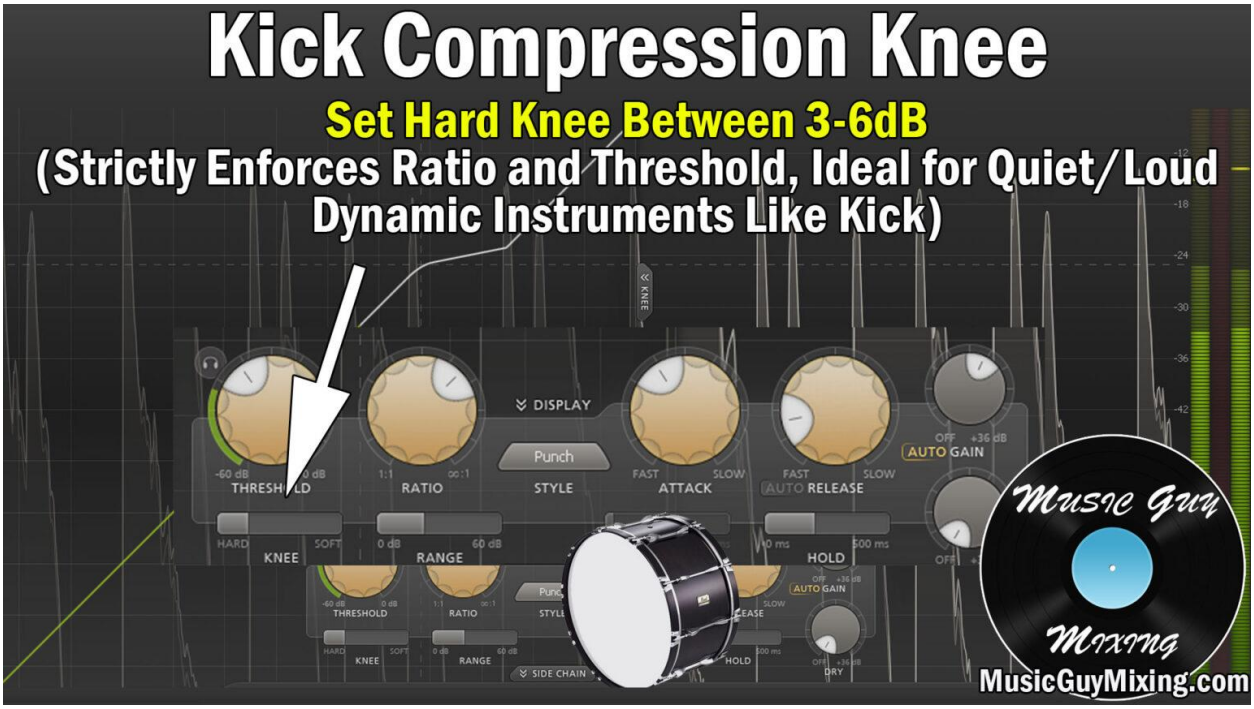
This is where (when combined with the makeup gain) we get that added thickness and sustain from the rest/meat of the kick.

Knee

The compressor knee determines how strictly the threshold and ratio are enforced.

Again, because a kick has such clearly defined dynamics and peaks, I like to strictly stick to the threshold and ratio I set.

To accomplish this, I like a hard knee of 3-6dB on the kick drum.

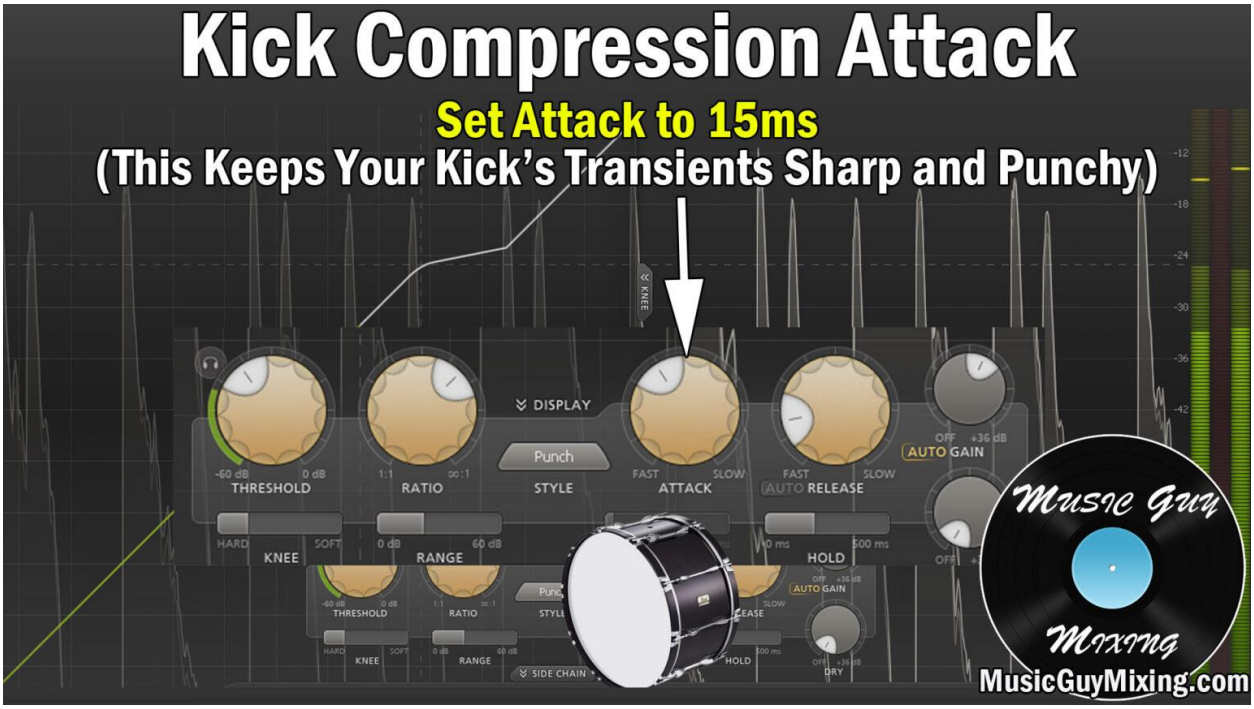


This ensures that the signal is barely compressed at all unless that threshold is met.

Attack

I referenced this earlier, but the compression attack is how soon after the signal crosses the threshold that compression actually begins.

I recommend an attack on your kick compression of 15ms.



This delays the compression more than long enough to let the sharpness of those transient peaks around 5k (see what are transients) cut through the mix before the compression clamps them down, pushing up the body of the kick.

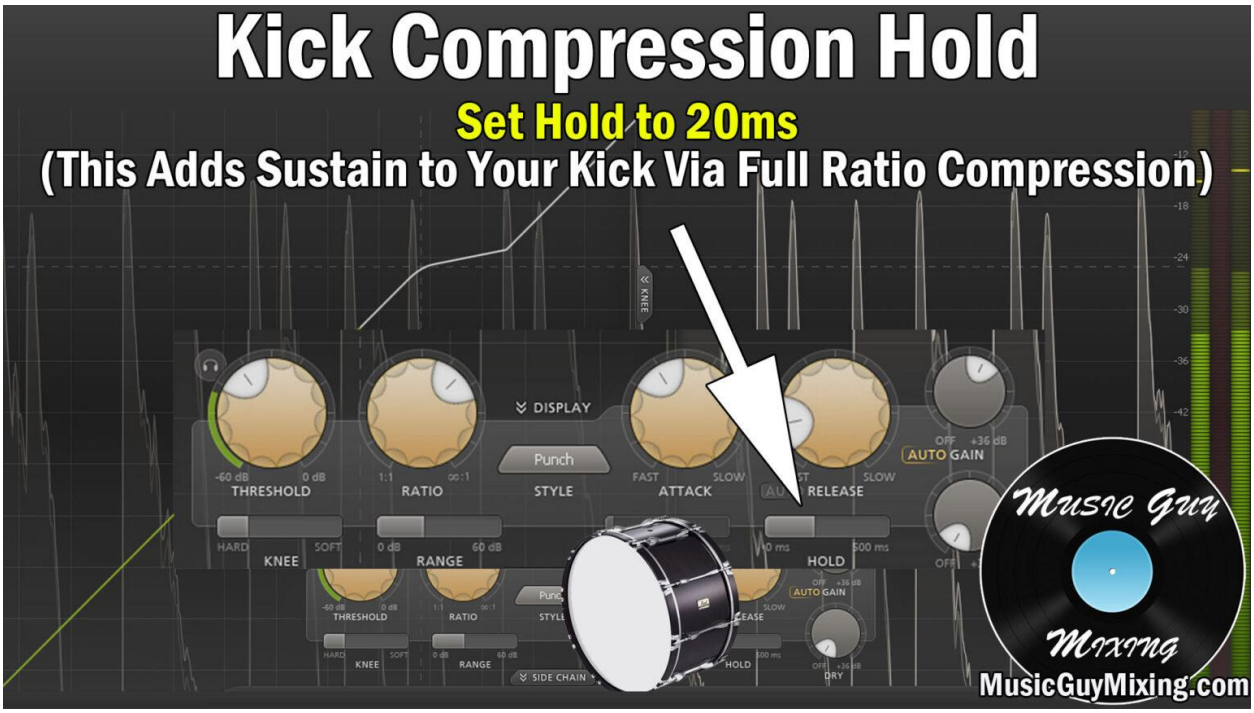
This is what yields a more balanced kick, so with 15ms you're getting the benefits of the compression while keeping the punch of the transient.

Hold

As I mentioned in my comparison of hold and release on the compressor, the hold feature keeps the compression for the set amount of time.

A little hold alongside the release (which I'll mention next) helps to give the thickness achieved from the compressor a little added sustain.

To that end, I like to set a hold of about 20ms on my kick compression.



You can turn this up if you want a bit more sustain from the kick, but remember to set this alongside the kick's release.

Release

The release on the compressor is the amount of time it takes for the compressor to ease the audio back to its fully uncompressed state.

Set your release somewhere between 30-50ms to give your kick a transparent amount of decay.

Combined with the hold we just set, this should give your kick the added thickness via sustain that we want.

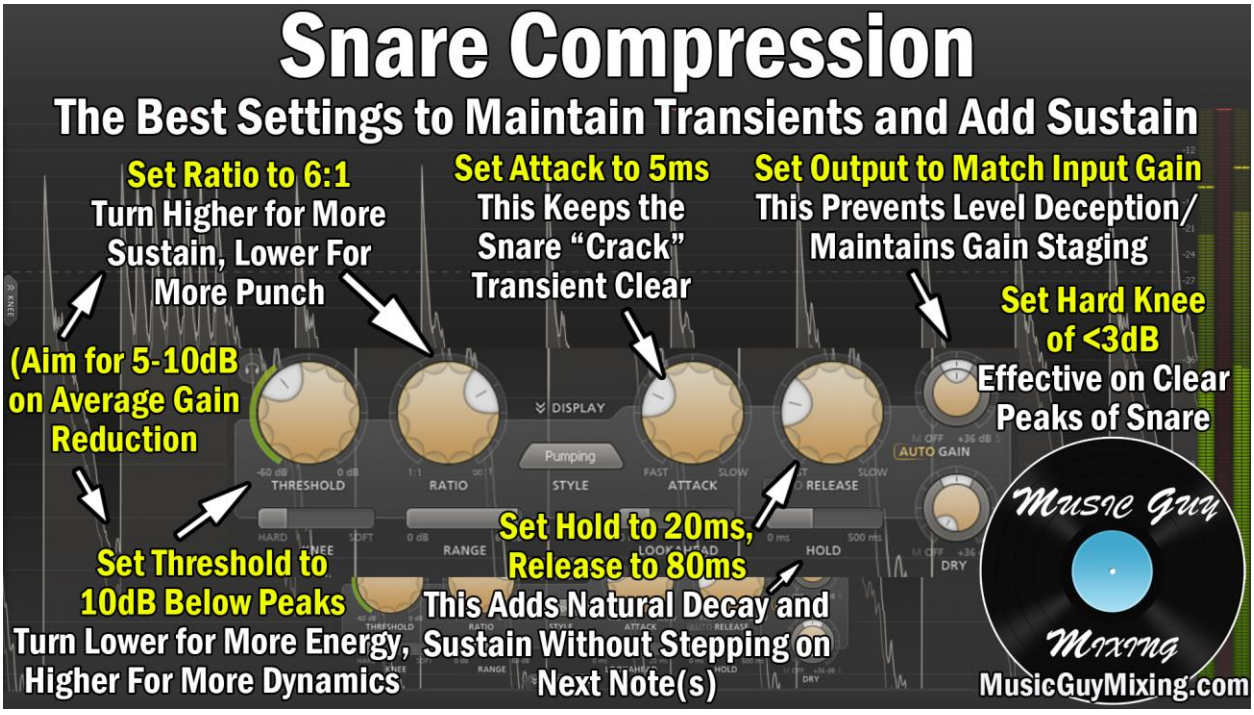
Output

I can’t overstate the importance of matching your output level to your input level.

In order words, set your makeup gain so that whether the compressor is on or off, the volume remains the same.

This ensures that we can effectively evaluate the effectiveness of the compression you added, not to mention it it keeps gain staging intact for the next plugin in the chain.

Snare

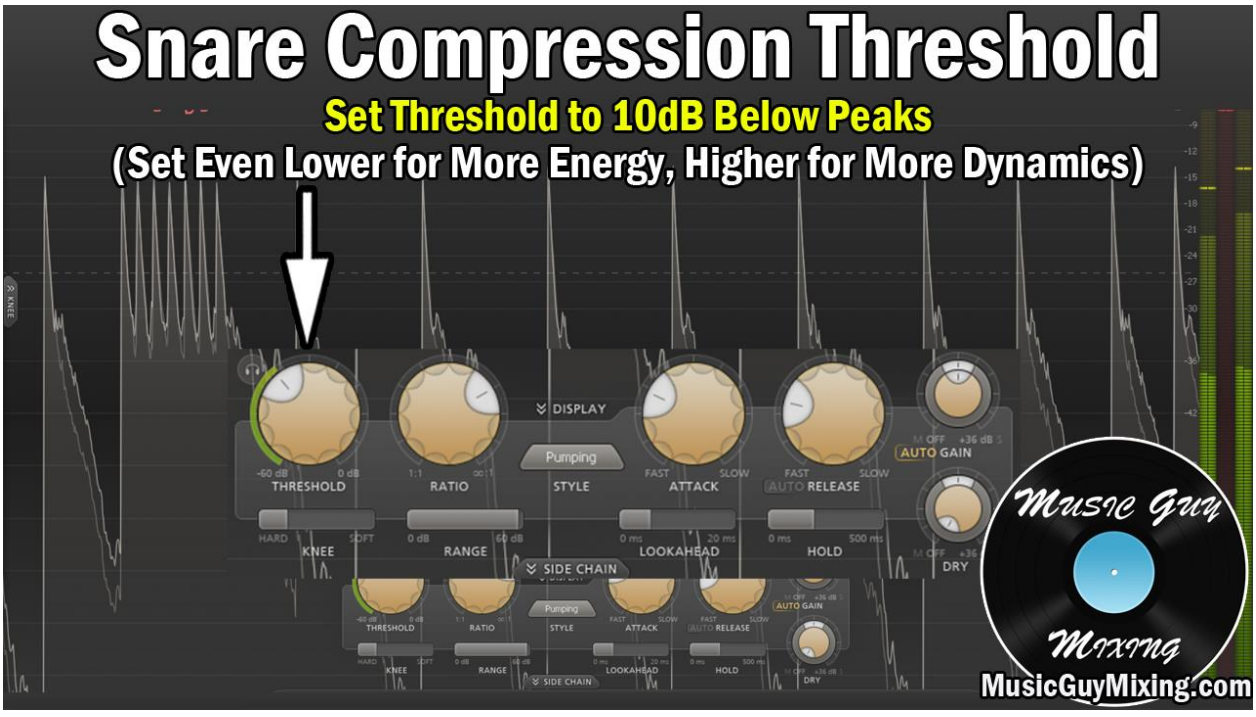


Applying a compressor to your snare can actually help the initial transients be more present as well as beef up and add sustain to the main body and fullness of the sound.

Let's take a look at my recommend snare compression settings and go through each setting one by one to better explain why and what they're accomplishing.

Threshold

With snare compression, I generally set the threshold at roughly 10dB below the average peak level.

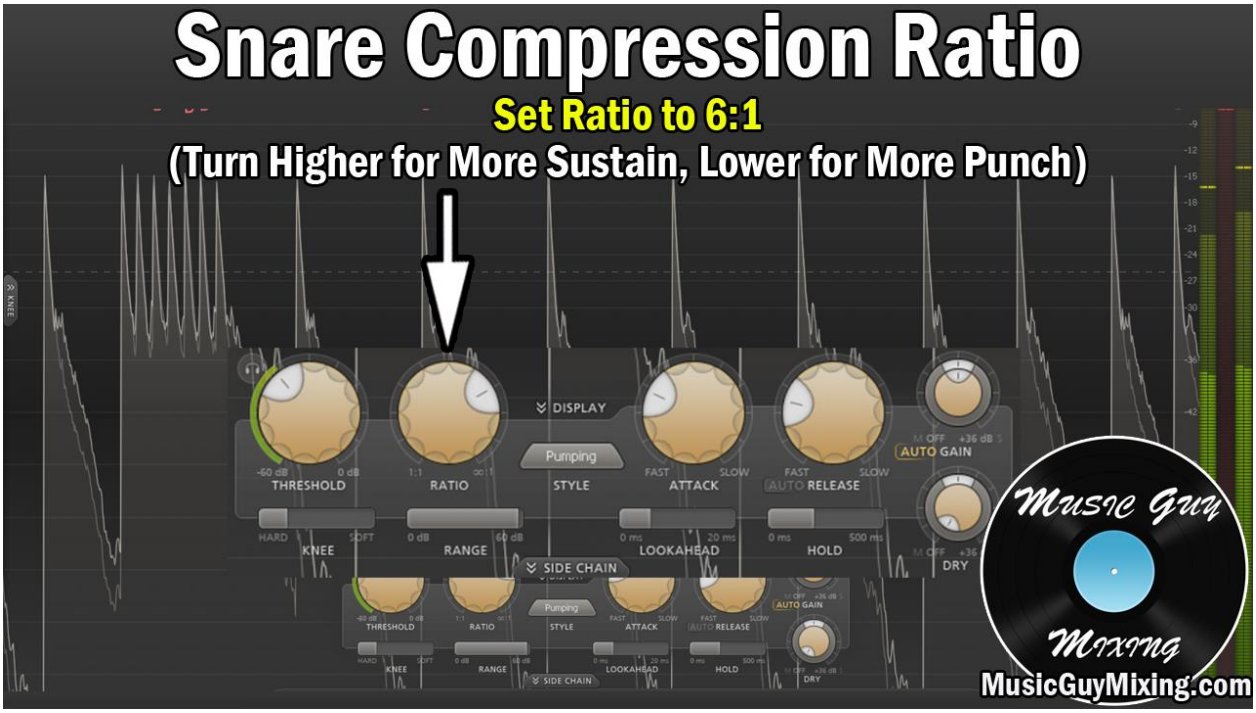


This pulls down enough of the peaks while giving me all of the sustain on the back end via the makeup gain which we'll talk about later. As always, threshold is just one element to the equation, so let's set the rest of our parameters.

Ratio

How much compression you want to apply to your snare will generally vary from genre to genre. A lower ratio is going to yield a more subtle effect, like just creating a bit more glue. A harder ratio will bring out a lot more of that sustain on the back end.

I recommend setting your snare compression ratio to 6:1, meaning every dB the signal goes over the threshold you set, it will reduce the output by 6 dB.



This typically gives my snares a bit more thickness, body, and presence in the mix without being too much. If you have a particular weak snare, you might need to go higher on your ratio.

Knee

A hard knee means that the compressor won't open or begin doing its job until the threshold is met. Once that threshold is met, it compresses at the exact ratio you've set.

Conversely, a softer knee opens more gradually ahead of the threshold and begins compressing at a lower ratio. That ratio increases the closer it gets to the set threshold.

A hard knee increases the odds that the listener will hear the compressor working whereas a softer knee makes it more transparent and more subtle.

When compressing a snare, I like hard knee of 3dB which better isolates the peaks.

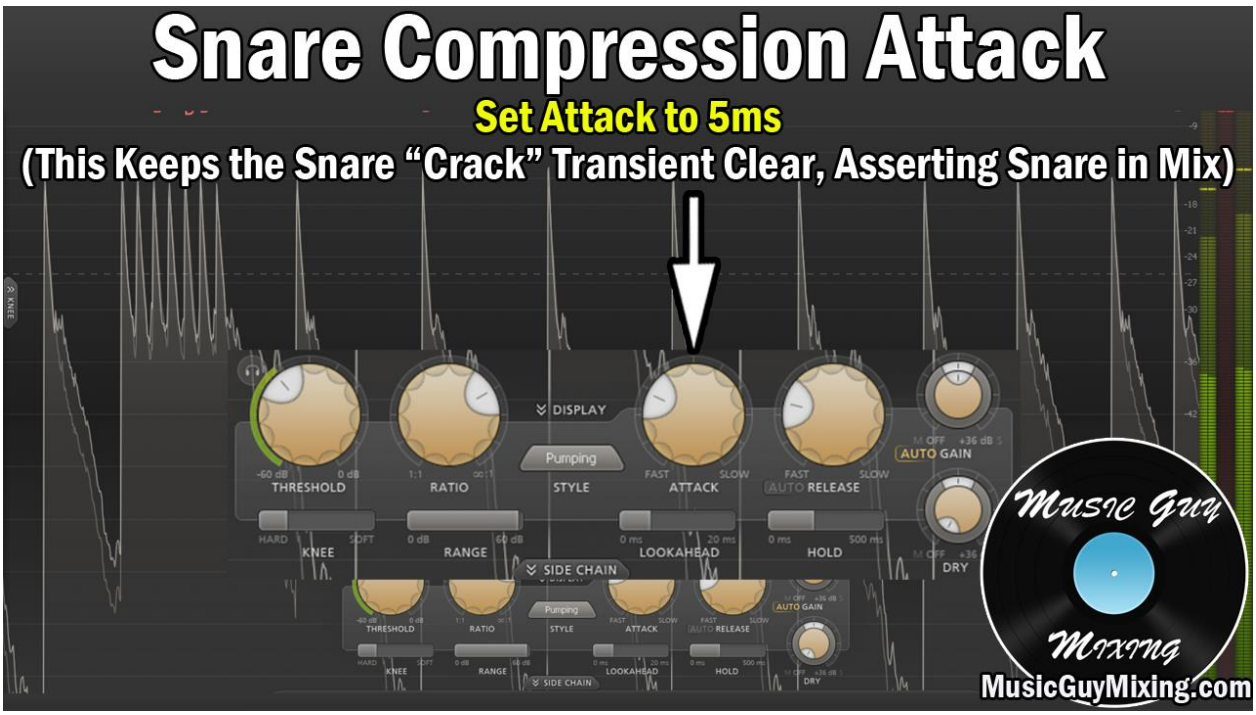
Attack Time

Compressor attack time is always important, but it's especially so when compressing a snare. If your attack time is too fast, meaning the compressor turns on too quickly when it receives signal, it will squash the transients and you'll lose the punch of the snare.

You want to adjust this so that the crack of the upper mid range transients are untouched and more of the

subsequent body of the snare is brought out for that thickness.

For snare compression attack, I like a relatively fast time of roughly 5ms.



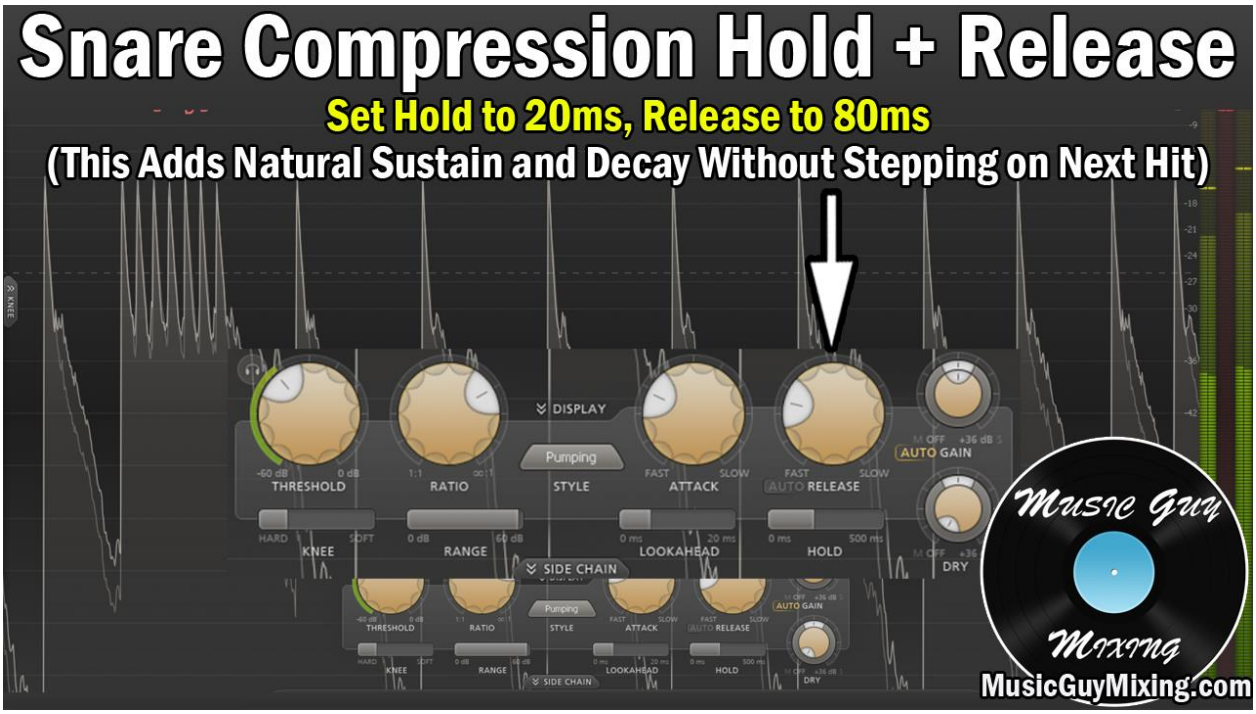
I still find that this is enough time to let the transient "crack" of stick on skin to pass through untouched before the compression snaps on to give us that desirable thickness on the back end.

Release + Hold Time

Leaving the release longer on a snare will give you more thickness from the body but you'll lose some of the snappiness from the compression that you want.

Again, the compression hold time adds a short stint of full compression AFTER the level drops below the threshold. This is good for a little added roundness on a snare.

Ultimately I like 20ms of hold time and 80ms of release time in snare compression.

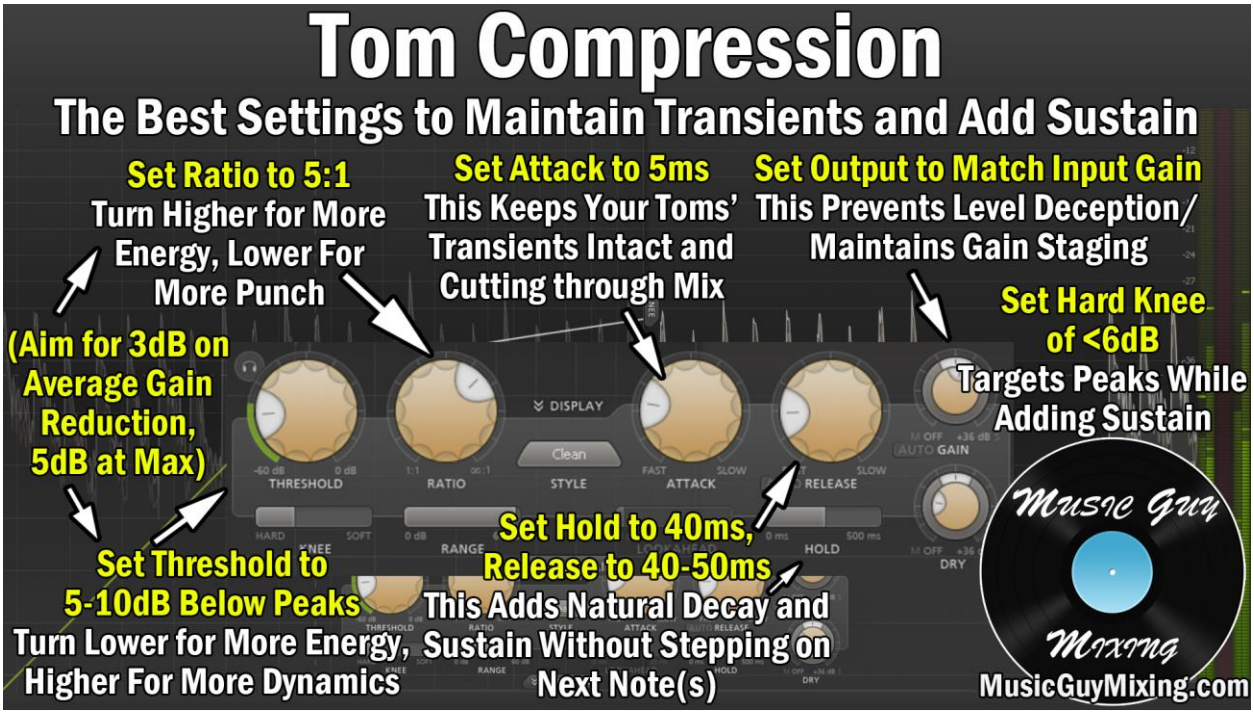


This is a healthy compromise in most cases to get the best of both worlds, more presence and thickness while keeping it responsive and clean.

Output/Makeup Gain

Lastly, adjust your output gain as necessary to make up for any gain reduction the compressor creates.

Toms

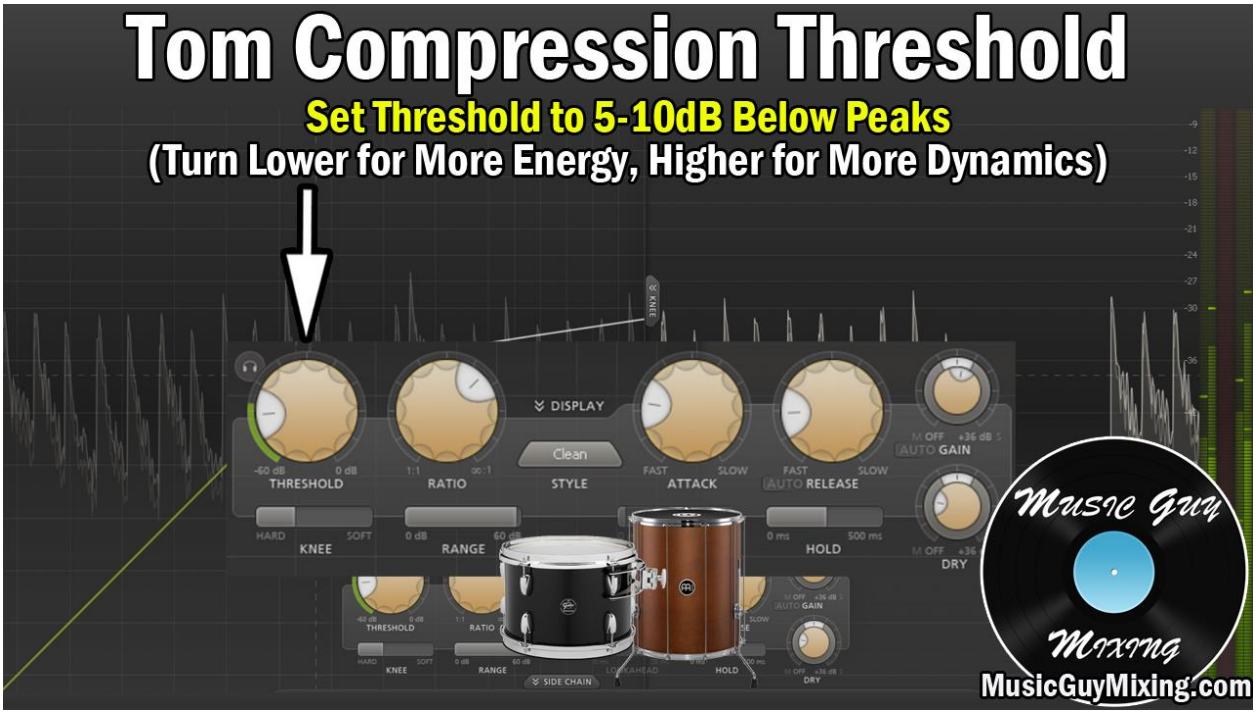


Whether we're talking floor or keg toms, a well compressed tom has added sustain and thickness while maintaining the bright transients to cut through the mix.

Threshold

Similar to kick compression, the peaks on a tom are relatively consistent, depending on the performance.

Similar to the kick, I typically aim for 5-10dB beneath the peaks when setting the threshold on my tom compression.

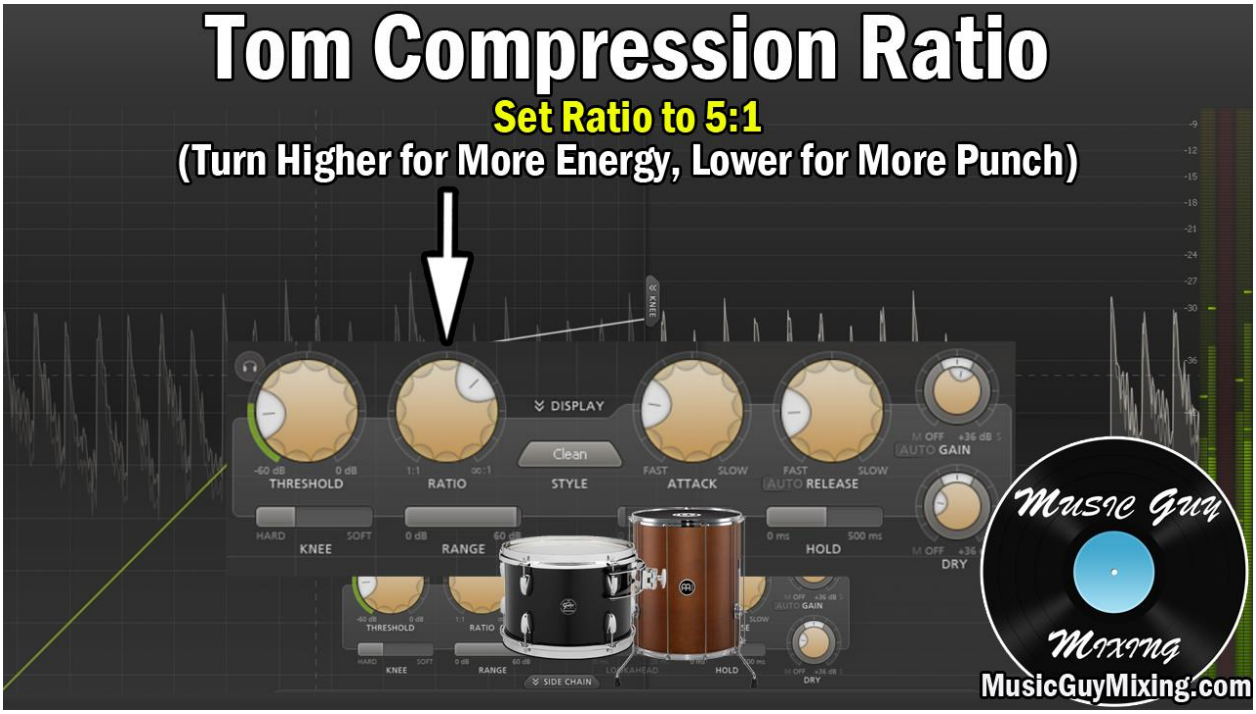


Along with the rest of the settings, this will typically bring on around 3dB average gain reduction and 5dB or a shade more on the loudest peaks.

The rest of the settings are instrumental in achieving that gain reduction, particularly the ratio.

Ratio

I like a relatively higher ratio of 5:1 on tom compression which helps in bringing out more sustain on the back end.



If the threshold is exceeded by 5dB, the output is brought down to 1dB exceeding that ratio, or 4dB in gain reduction.

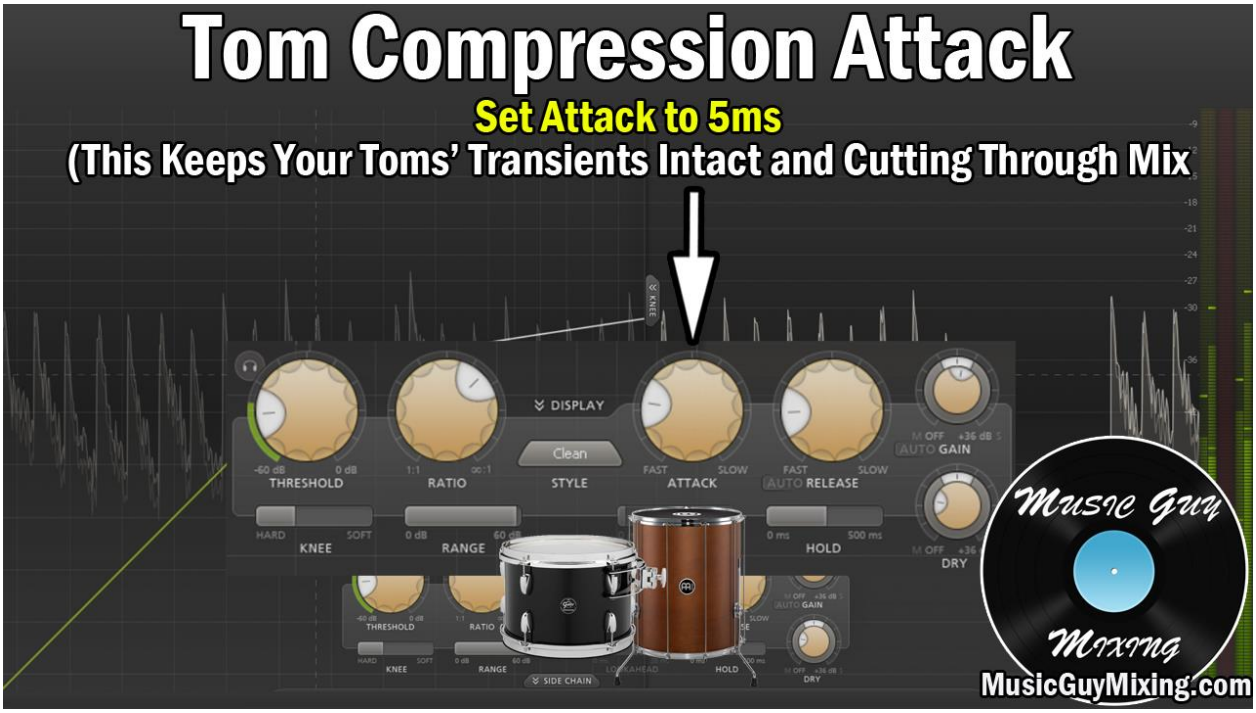
If you want more energy, turn the ratio higher. If you want a punchier sound from your tom, turn the ratio down.

Knee

I like a relatively hard knee of 6dB on my tom compression to strictly enforce that threshold to mostly target the peaks.

Attack

I like a relatively fast attack of 5ms on tom compression.



This is enough of a delay of the compression to allow the transients of the tom to cut through the mix.

The transients are those higher frequencies on the instrument which precede the rest of the frequencies and sound.

In the case of a tom specifically, the transients would relate to the sound of stick on the head of the drum.

That “crack” helps the tom cut through the mix, drawing the listener’s ear to the rest of the sound.

5 milliseconds may not sound like much, but it’s enough for the tom to come through at full volume to assert itself in the mix before the compression pulls it down and effectively amplifies the rest of the sound.

Release and Hold

The release eases up the compression more naturally after the hold time. As I specified in my comparison of hold and release, zero release time will result in an abrupt drop off, manifesting in a pumping sound.

As such, you need some release otherwise the compression will sound awkward.

With tom compression, I like a hold and release time of 40ms and 40-50ms, respectively.

The hold gives a nice added cushion for more back end sustain while the release eases off of the compression in a transparent way.

You may need to adjust these depending on the performance. Sometimes if I've got a lot of tom heavy fills, especially when some of which feature fast beats, then I'll switch to an automatic release time which varies the time as necessary.

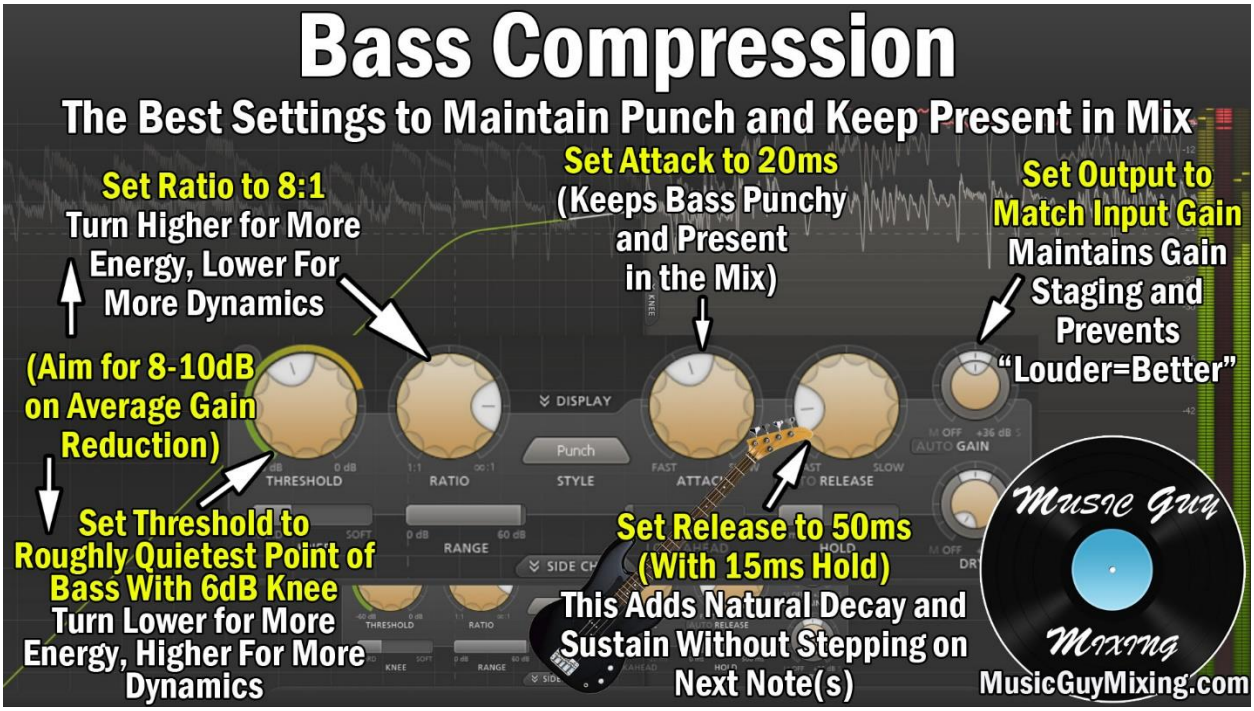
Output

It’s important that you adjust the makeup gain last to match the level of the tom(s) without the compression.

The level will be lower with no makeup gain because of the gain reduction of the compression, so to ensure that the track stays sitting right in terms of volume with the rest of the mix, we need to adjust this.

Simply adjust this level and split test with the compression on and off until it sounds the same while the tom is or toms are playing.

Bass



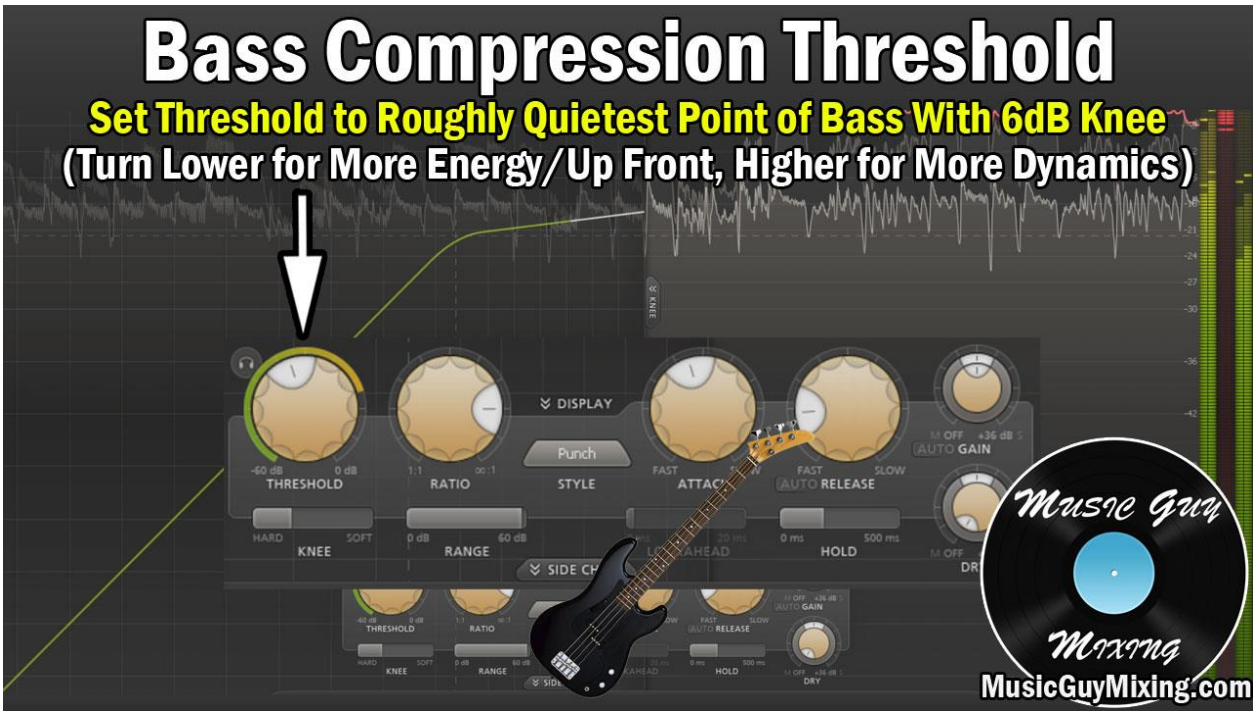
Bass, particularly bass guitar, can be a dynamic instrument with relatively extreme differences between the quieter and louder parts of a performance.

Compression helps to sacrifice some of those dynamics in order to achieve a more consistent and steady sound which can have more sustain and energy. Overdo it and you drain the life and possibly the transients out of the performance completely.

Let’s go through each of the settings to get your bass sitting just how you want in your mix via compression, starting once again with the threshold parameter.

Threshold

I typically like to set the threshold to roughly the quietest played note of the bass:



Practically speaking, if the verse is played substantially quieter than the chorus then I’ll likely separate these or automate the settings from one section to the next.

This means that I'll be compressing the majority of the signal, though the louder parts will be attenuated more. This is an aggressive threshold admittedly as opposed to just catching peaks, but it helps to keep my bass constantly present in the mix.

Knee

As always, if we set a softer knee, compression will begin BEFORE the threshold which we just set is met.

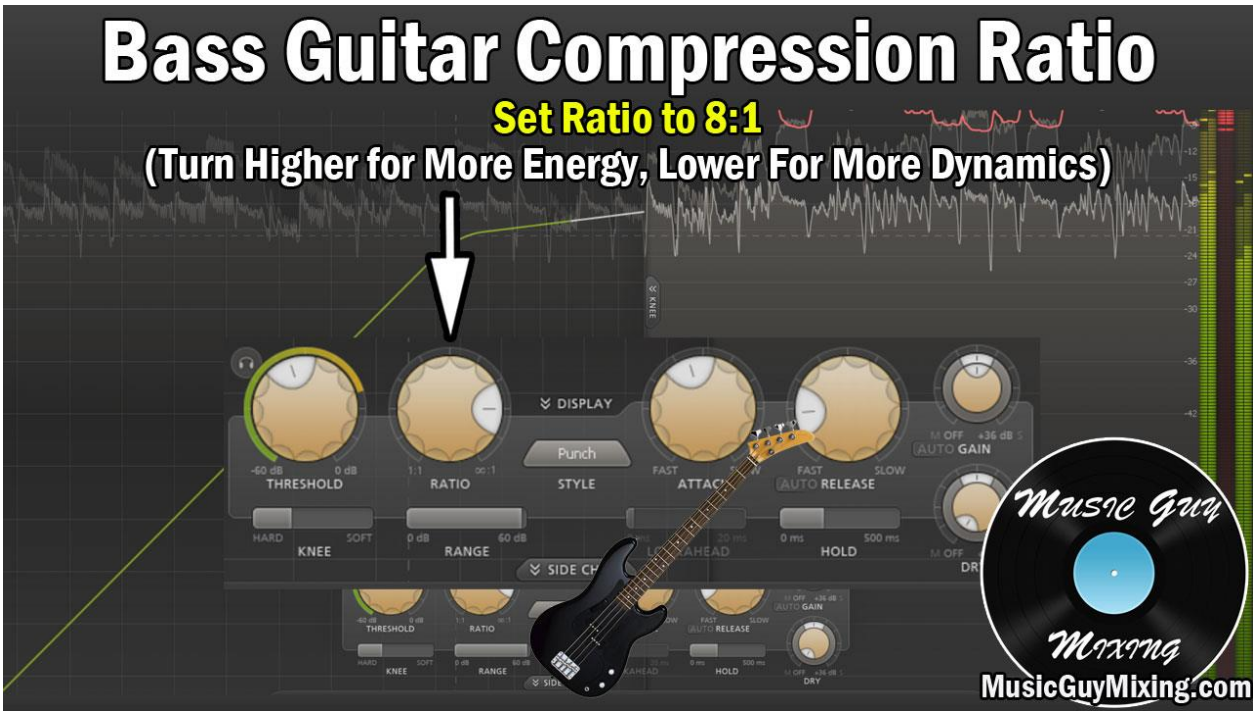
I typically opt for a hard knee for bass compression (specifically I set it to 6dB).

While it's a bit less transparent, I like that the threshold I set is strictly adhered to and compression will only be happening at the ratio I set, resulting in some tight attenuation of those peaks.

Ratio

As a general rule, the more dynamic the signal, the higher a ratio you'll need.

With bass guitar being one of the most dynamic instruments, depending upon the performance, I typically use a ratio of 8:1.



Admittedly this is on the above average/aggressive side, but it really helps in bringing the bass under control and more importantly keeping it up front and present in the mix.

Sometimes I'll even drive this ratio higher (I'll even turn to a limiter for bass compression in some cases):

You might even pull the threshold down lower to compress more of the signal if it's especially dynamic or you want to add more energy to your bass.

Between the ratio and threshold I aim for 8-10dB in gain reduction on average to get more energy and consistency out of my bass track.

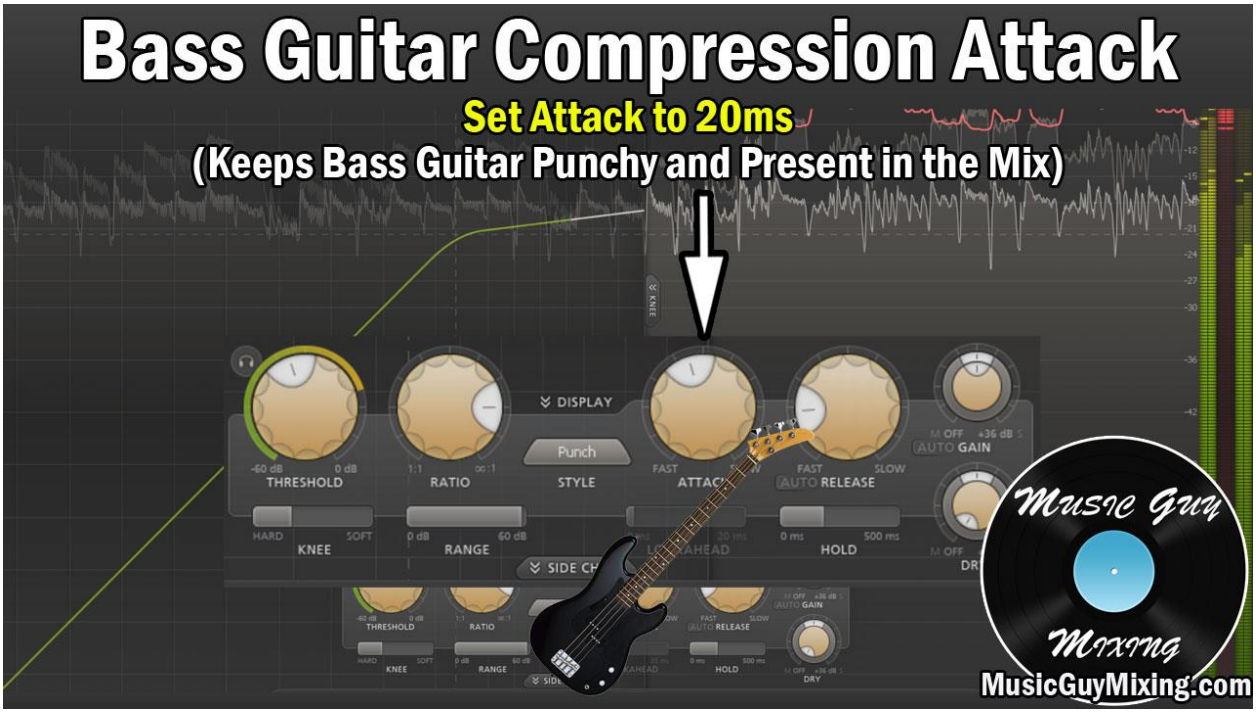
Attack

Setting the attack at the fastest/shortest speed effectively pulls down the peaks the instant they cross the threshold.

The problem with that is that this can kill the transients of our bass, the higher frequencies that cut through the mix. Adding a little attack can let the bass peaks come

through at full volume for a split second to help the bass assert itself before it gets pulled back down.

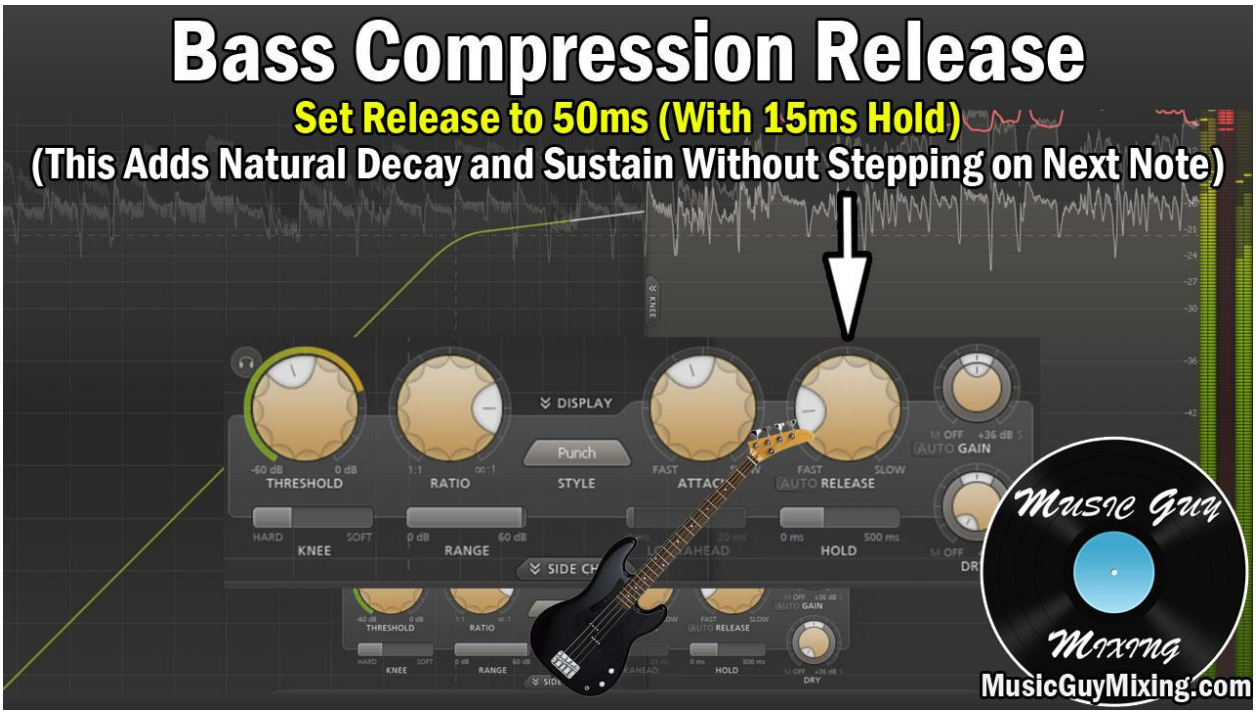
A medium attack time of 20ms can be enough to achieve just that, keeping the transients intact while getting the benefits of the compression.



Release

Once again, the compression release time reflects how soon the compression “releases” the signal after it drops below the threshold, back to its normal state.

Try listening with your bass compression release time of 50ms plus a hold time of 15ms.



The hold time adds an amount of time of your choosing where the compression is still fully engaged even after the signal drops below the threshold. Check out my of hold and release for more information, but I like a bit of hold time to pad the release to get a more natural overall release.

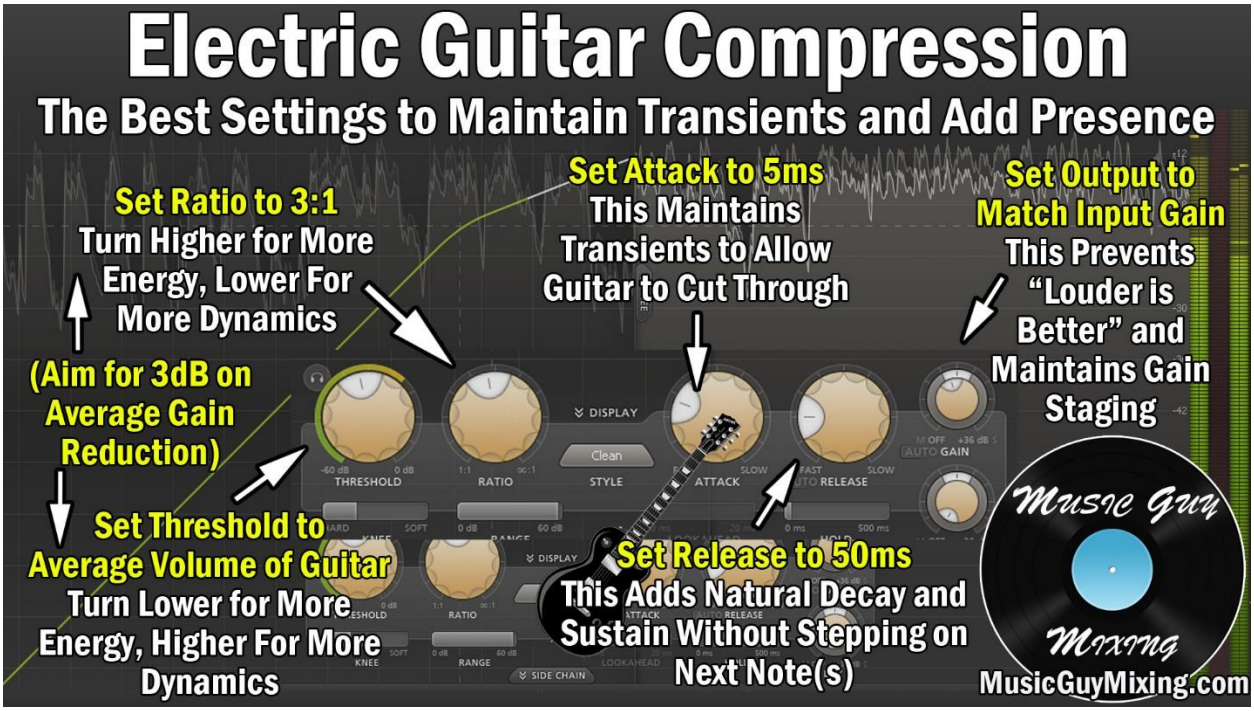
If you're not sure where to set your release, you can always go with the automatic release setting.

Output Gain

As important as any other move you make, be absolutely sure when you're split testing with the compression on and off to survey your progress that the output gain matches the input gain.

Not only is this important for gain staging to get the best sound out of the bass for the next effect in the chain, it keeps you from favoring whichever instance is louder.

Electric Guitar



Compared to compressing vocals or even compressing bass, electric guitar is generally one of the less dynamic instruments in your mix.

Still, the occasional rhythm part or especially riffs and solos call for electric guitar compression to smooth them out and bring a little more energy to the part.

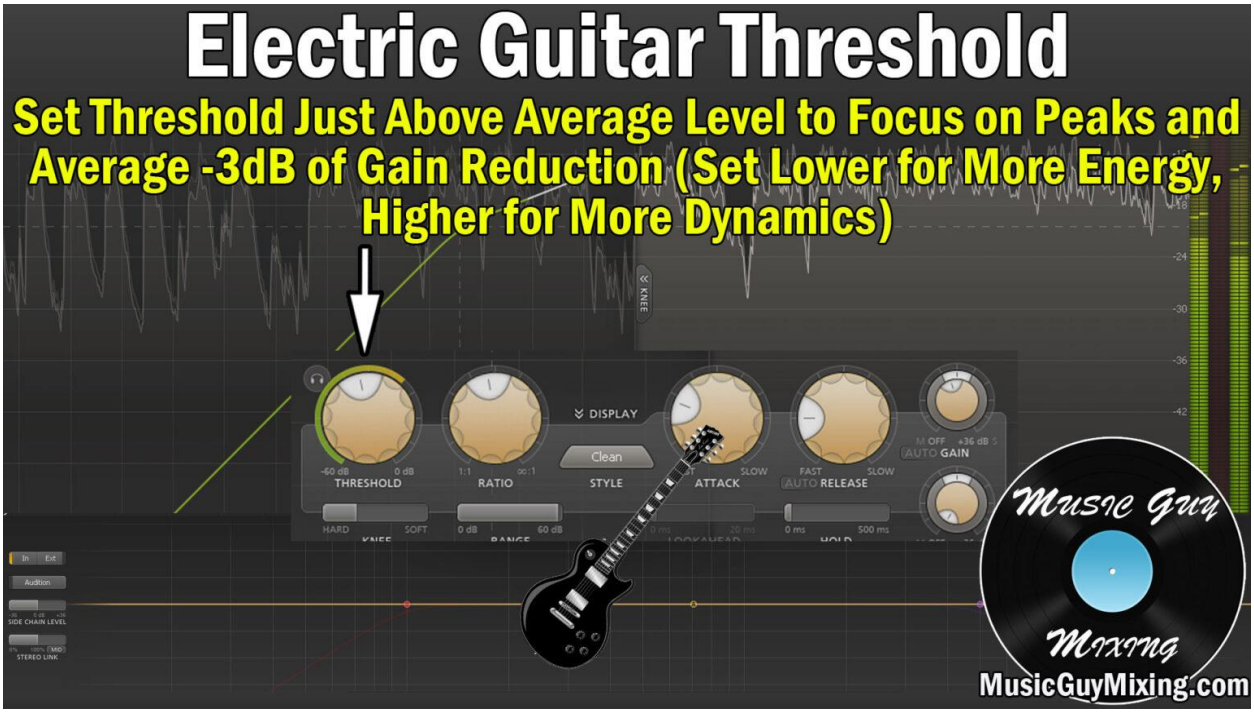
Let me preface this section by acknowledging that “electric guitar” can have a number of different connotations as it relates to tracks in your mix.

While these settings are more geared to chords, be aware that you should likely go more aggressive when you’re trying to bring more energy and cohesion to a picked part versus strumming, though I’ll address this in each section.

Threshold

The compression threshold dictates the required input signal on the electric guitar before compression will begin.

For electric guitar compression, given the relative lack of dynamics, I like to set the threshold at roughly the average level of the performance.



A good rough starting point is to achieve around 3dB of gain reduction when the compressor is engaged. Note that this relates to the ratio of the compression itself which we'll cover in a second.

This especially targets the peaks, kissing the average level slightly, and leaving the quietest parts untouched (raised by the makeup gain ultimately).

I prefer a relatively harder knee to strictly enforce the threshold and leave the quieter bits uncompressed.

As always, turn the threshold down if you want more energy with more of the signal compressed. Turn it up if you want to leave it more dynamic.

My general rule is when the guitar or track in general is fighting a busier mix for real estate, you want more energy over dynamics. If the guitar is more prominently featured in a sparser mix, turn the threshold up and leave it more dynamic.

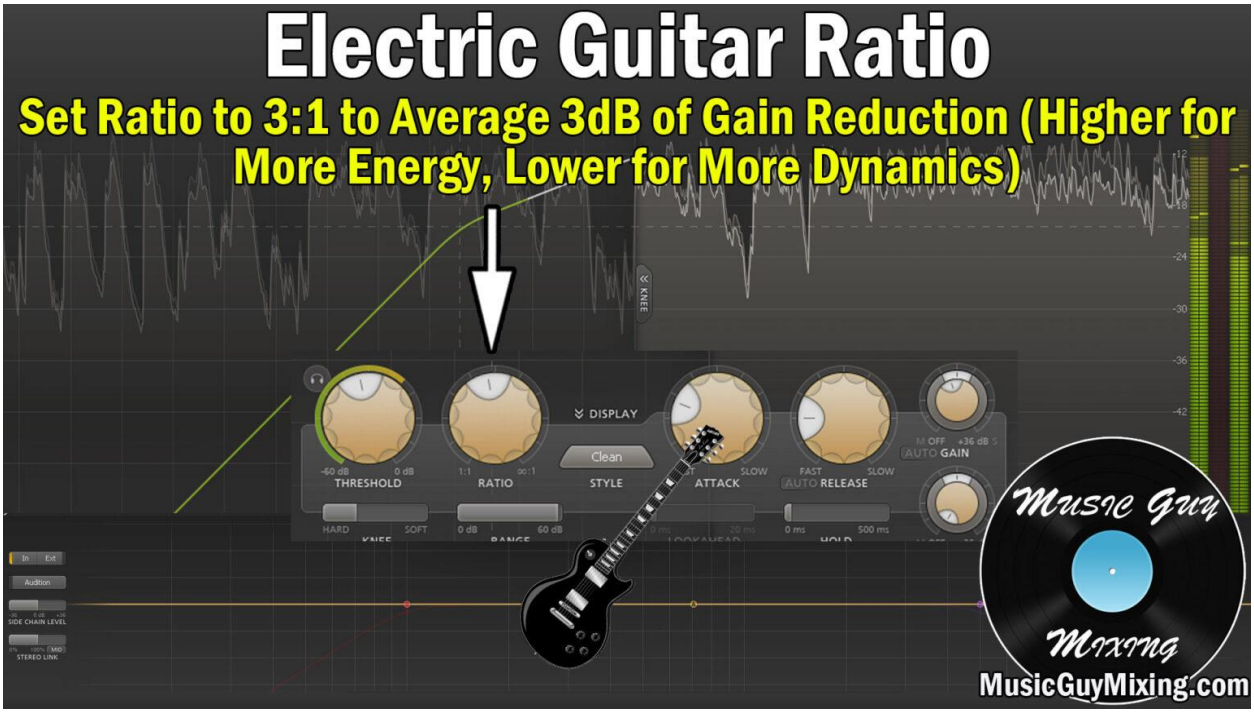
And as I mentioned earlier, if it's a more dynamic part as is the case with picked, arpeggiated type parts, you'll likely want to drop that threshold to the quietest note(s).

The same rule applies to the ratio, so let's hit it now.

Ratio

The compression ratio works together with the threshold to determine how much of the signal gets reduced.

I like a relatively conservative ratio of 3:1 when applying this in particular to a strummed part such as chords.



With a 3:1 ratio, if the threshold gets exceeded by 9dB, it gets reduced to 3. If the threshold is exceeded by 3dB, it becomes 1dB.

3:1 is on the lower to average rate of compression and I find it works well for just smoothing out the peaks of the guitar on strummed parts.

If you've got a picked part which lends itself to more dynamics, you might want to double the ratio to a 6:1 to bring more control to the part. Attack is very important in this case, so let's move on to that.

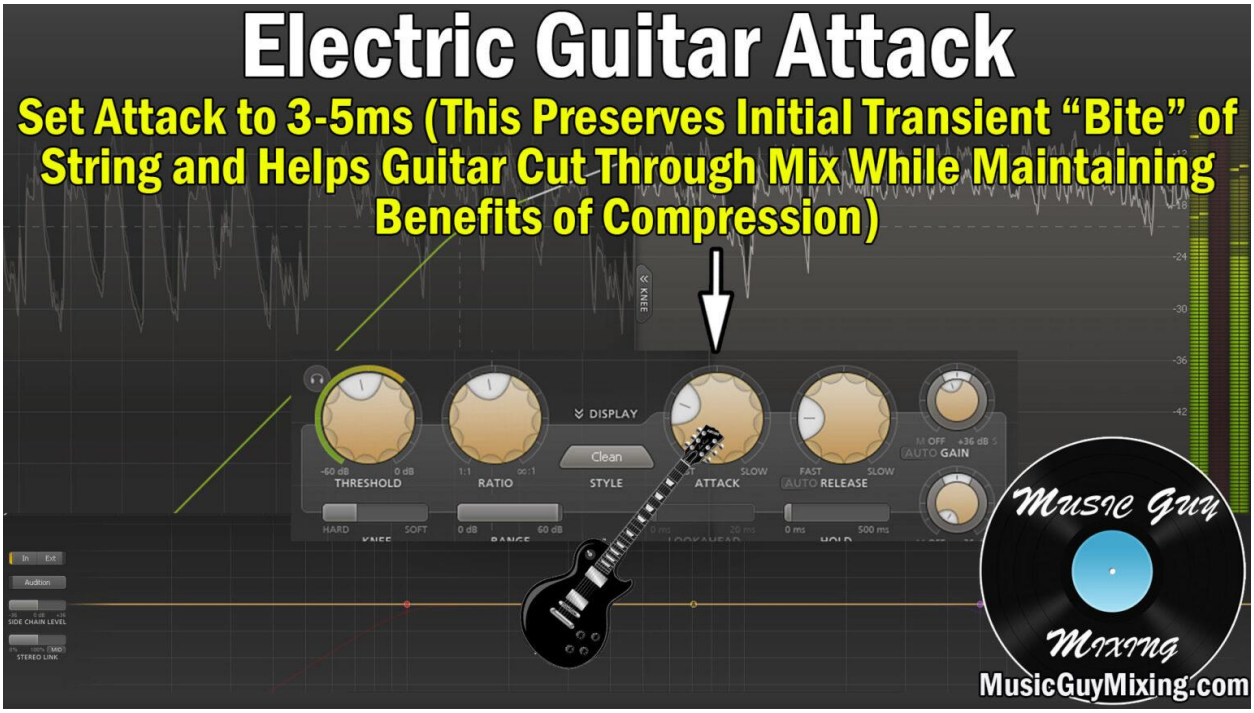
Attack

The compressor's attack determines how quickly the compressor engages once that threshold is exceeded.

Setting this all the way to the left, meaning instant compression, on most compressors would suffocate the audio's transients.

Again, the transients are the initial "bite" of the audio, or the first element of the audio we hear. Because higher frequencies travel faster (see parts of a sound wave), in the case of electric guitar it's the sharp sound of the string itself.

As such, I like to set the attack to 3-5ms which is still enough to allow the bite of the string to figuratively “cut” through the mix.



This draws the listener’s attention to that electric guitar track for long enough before the compressor snaps down on the signal to get the benefits on the back end.

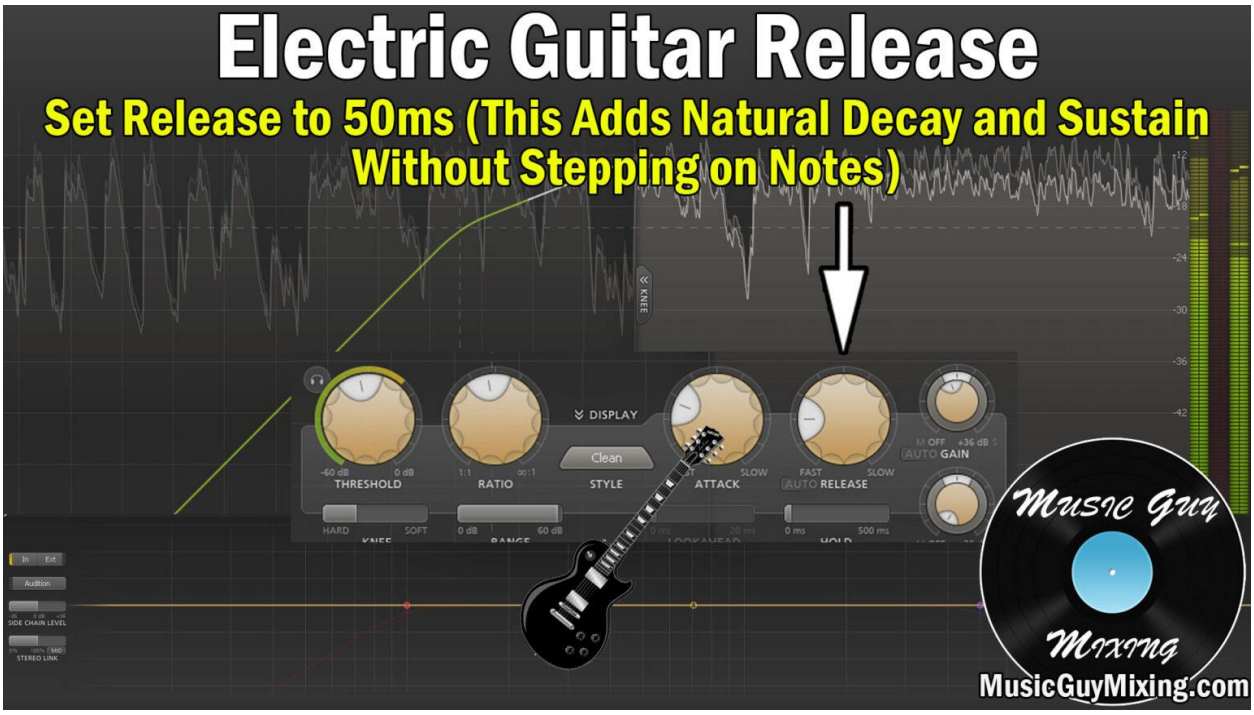
You might double this if you’re doubling the ratio as I mentioned earlier to give that uncompressed front end of the strings more of a breath in the mix in the case of a picked part, aiming for closer to 10ms.

As always, trust your ears.

Release

Rather intuitively, the compression release determines how long after the signal drops below the threshold that the track takes to return to its uncompressed state.

A release time of 50ms works well on electric guitar to achieve a natural decay and sustain with minimal artifacts or stepping on the next note.



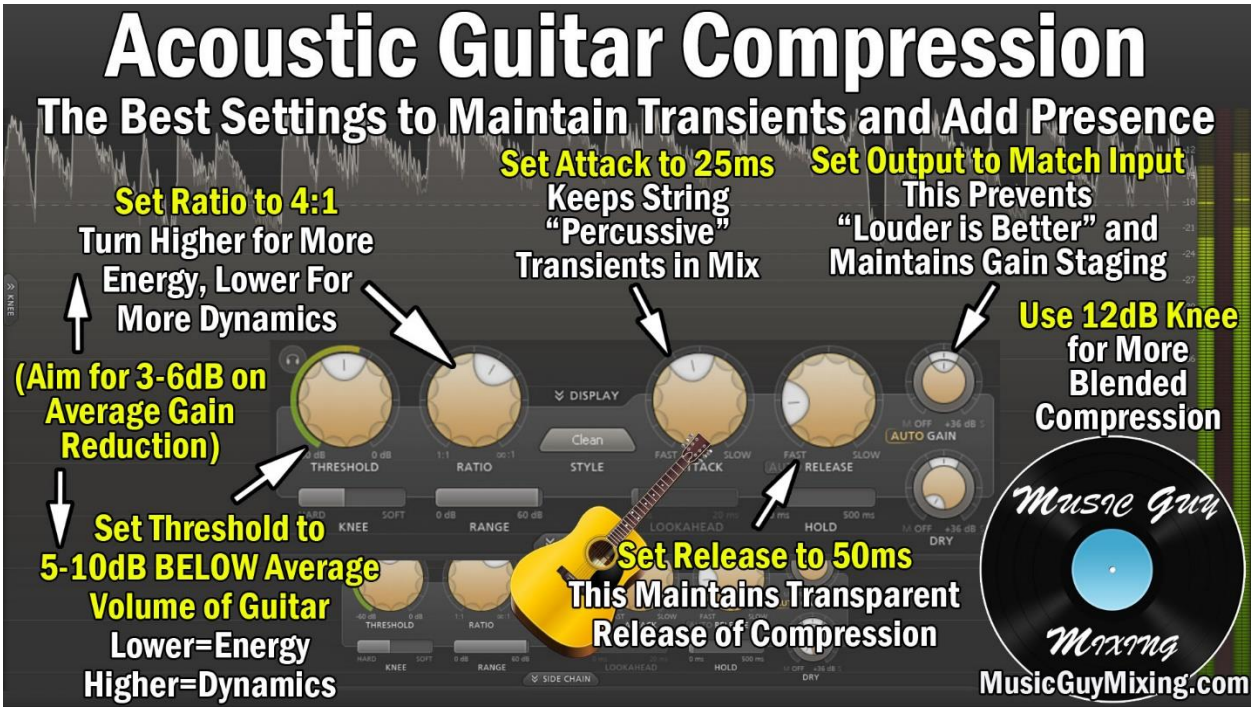
As with all of these settings, experiment to find the sweet spot for your specific track.

Gain

Don’t forget to set your output gain to match the level pre-compression to keep gain staging in mind!

One last tip – you might also try blending in some parallel compression like I covered earlier to add some thickness to your electric guitar by way of some absolutely squashed signal.

Acoustic Guitar



The acoustic guitar is another one of those deceptively dynamic instruments. The percussive nature of strumming combined with the fact that it's difficult to get a consistent performance means you'll need to reach for the compressor.

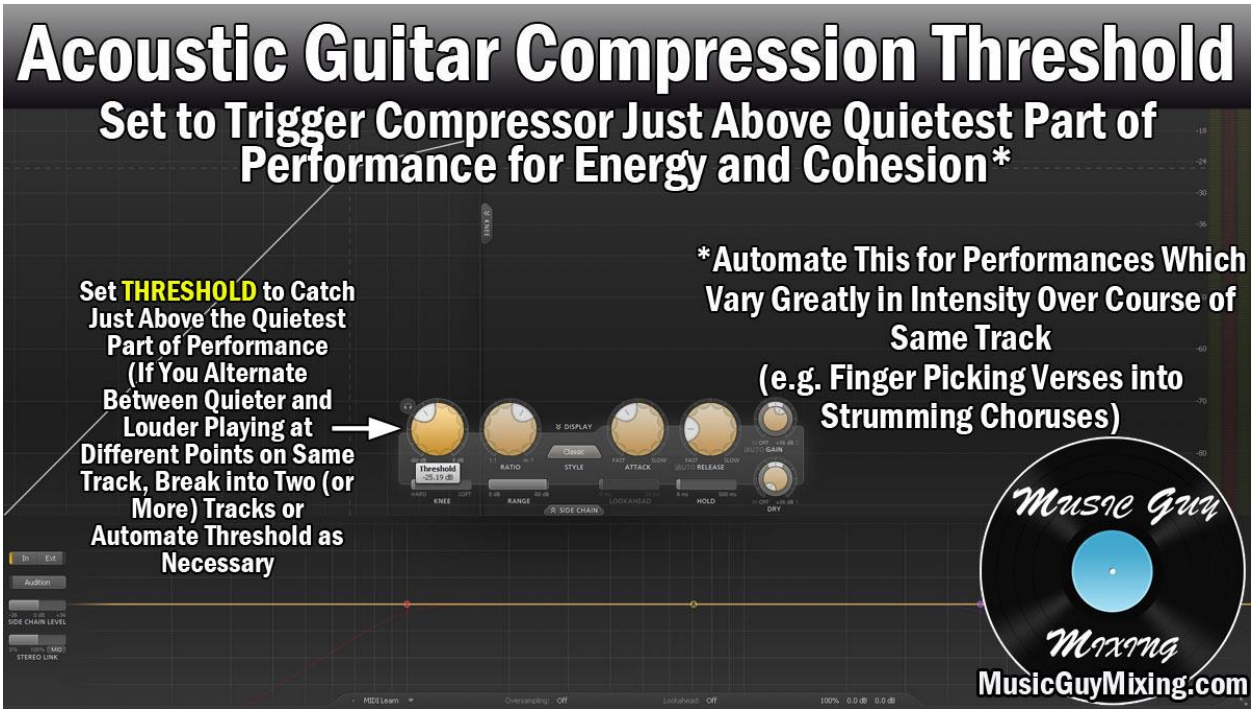
Compression on acoustic guitar gives you a more consistent presence and energy from a performance, and more sustain on the back end.

Still, using the wrong settings on your acoustic guitar's compressor can make it sound squashed or unnatural, so let's get into it!

By the way, make sure that you know how to record acoustic guitar to get the best sound before you even begin mixing. Also make sure you know how to EQ acoustic guitar so that we're just compressing the good stuff.

Threshold

When it comes to setting the threshold for acoustic guitar compression, I like to compress practically my entire signal, meaning I set my threshold just above the quietest part of the performance:



Note that I don't mean silence on the track, but the quietest moment of the performance itself.

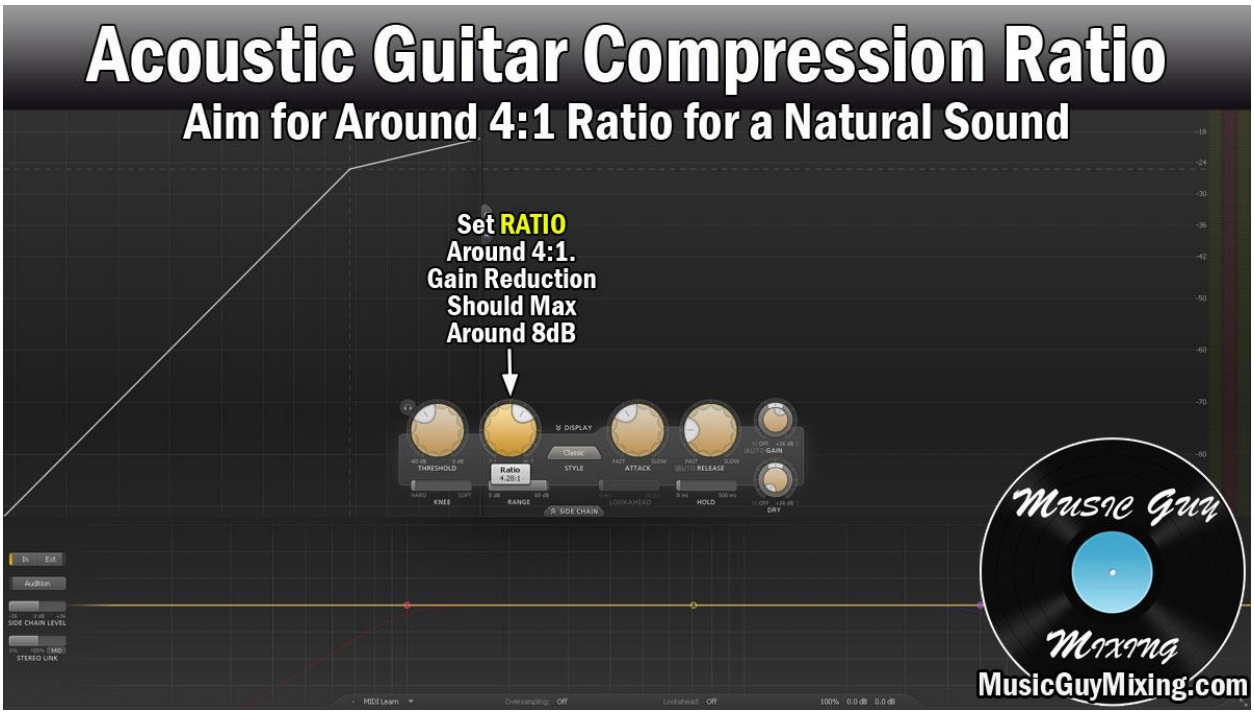
Also note that, as I specify in the graphic, you may need to automate this threshold or break your performance into two tracks if you alternate between say quieter strumming or picking for a verse before bringing more energy (and volume) during a chorus. Leaving this unchecked for an especially dynamic performance like that will absolutely squash the chorus section.

Having that threshold set at the lowest point of the track, however, gives you a thick, consistent, and professional sounding acoustic guitar.

Ratio

A relatively average ratio often works best on most acoustic guitar recordings/performances.

I typically set my ratio when compressing acoustic guitar to somewhere between 4 and 5 to 1.



For what it's worth, in the above image it's specifically set to 4.28:1. This combined with the threshold, for a performance of guitar strumming with average intensity, I aim for about 8dB in gain reduction at max. This is bringing down those peaks and giving me a smoother sounding performance which fits perfectly in the mix.

Knee

The compressor knee allows you to begin compressing the signal at a lighter scale as it approaches the threshold. In sort of relaxes the threshold and can be used to give you a more gradual and sometimes more natural compression.

As you could see from the initial graphic above, I prefer to use a mixed knee, typically around 12dB or so. This means the compressor largely adhere to the threshold, but it will begin compressing at a lighter ratio as the signal approaches the threshold. This makes for a more transparent blended compression.

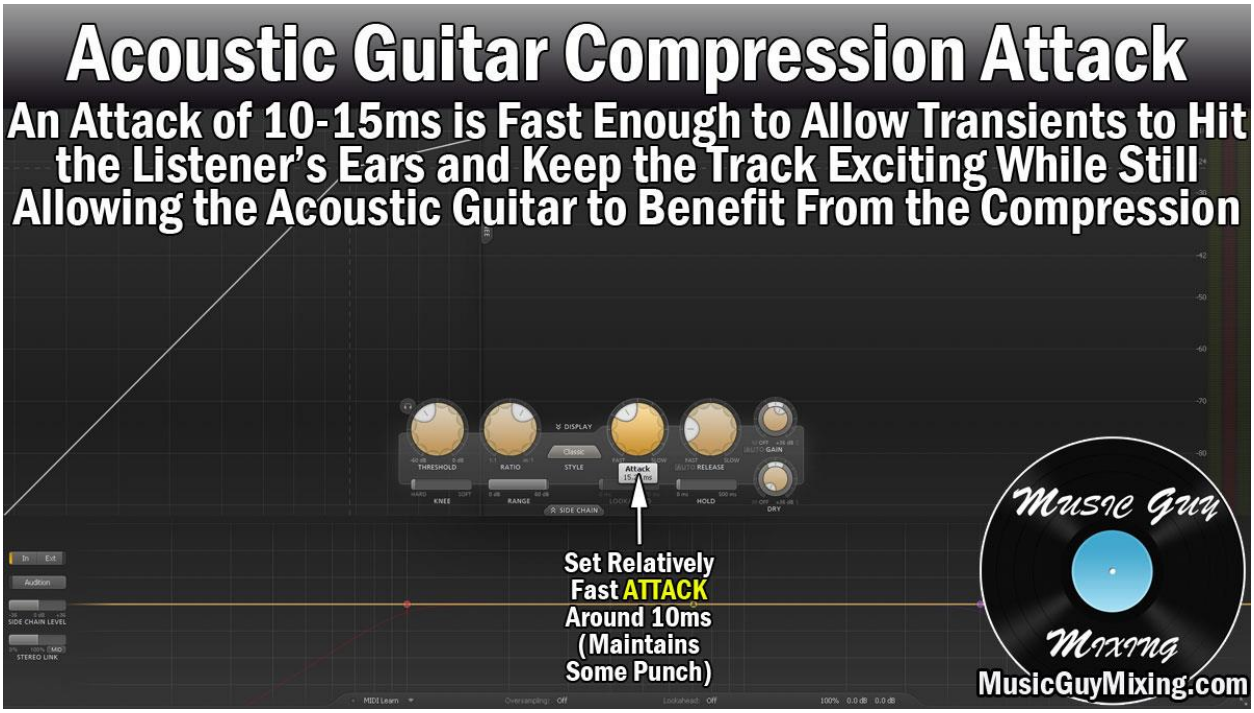
The loudest peaks will still be reduced the most, and I like the energy and consistent sound I get from setting that mixed knee.

Attack

Forgive the refreshers, but the attack of the compressor dictates how long after the signal exceeds the threshold before the compression on acoustic guitar begins engaging.

The slower you set this, the more transients, or more of that initial uncompressed sound gets heard.

Setting this to the minimum means less punch of those transients is heard, or better said "felt". This is why I recommend setting the attack to 10-15ms.



This allows the front "bite" of those early transients to be heard before we get the effect of the compression.

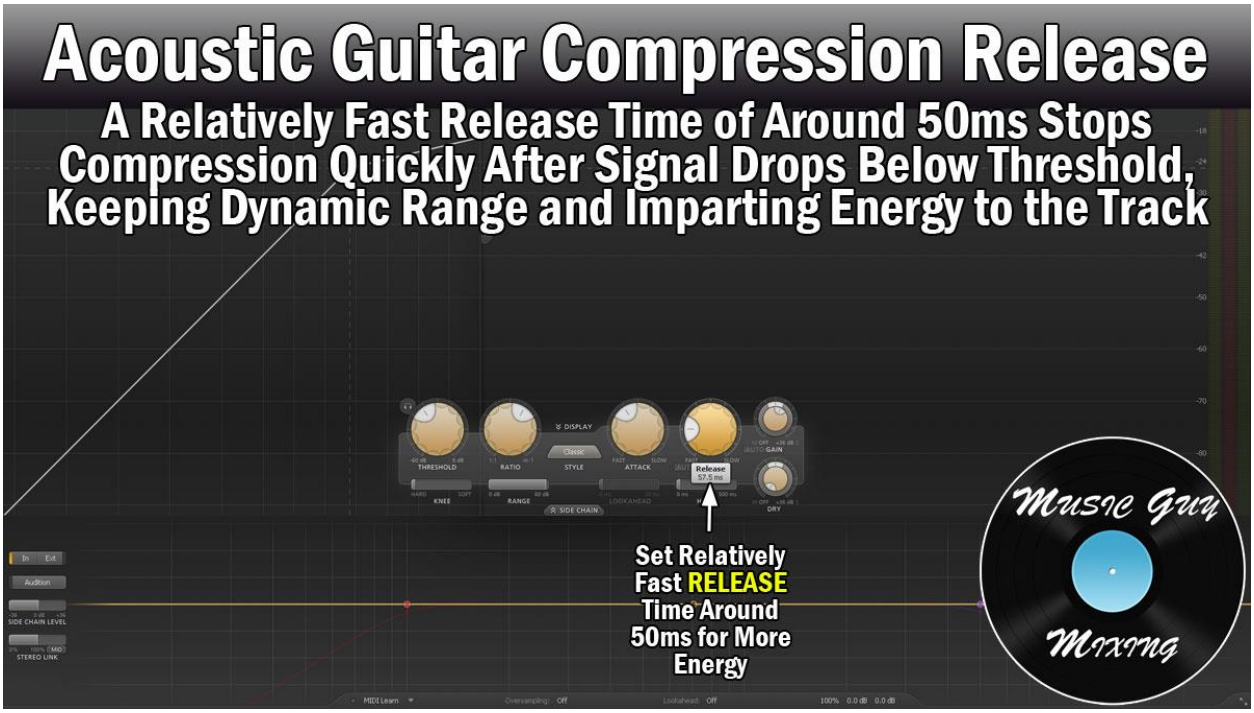
Release

Relatively faster release times sound more natural because they maintain more of the dynamics in the audio.

Ideally you want to set this to be roughly the length between the peaks in the song so it can release and be

ready to turn back on rather than outlasting more than one peak.

As an effective starting point, I like to set the release on acoustic guitar compression at roughly 50ms on average.



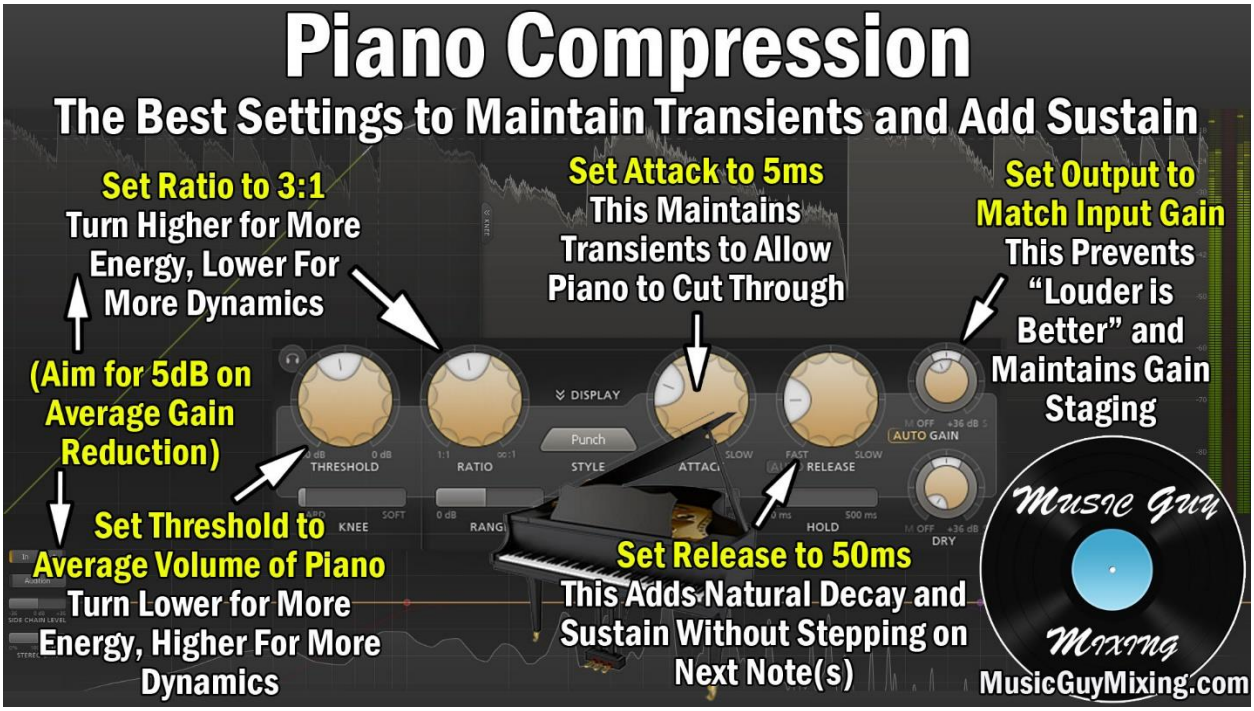
This keeps the compressor from over-compressing parts of the track it shouldn't and basically squashing the sound. This tighter release time also adds a bit of energy to the performance as it turns on and off.

Note that setting the release time TOO fast, meaning it releases instantly as the signal drops below the threshold, creates a gritty, unnatural sound.

Output Gain

As always, make sure that the volume level with the plugin turned on, in this case our compressor, is the same as the volume with it turned off.

Piano



Piano is one of the trickier instruments to compress correctly. It's all about finding that sweet spot to not step on the transients and getting the sustain on the back end.

I recommend a FET or optical style compressor for compressing piano (refer back to my overview of the 4 types of compressors) but these settings will work on most compressors including your DAW's stock compressor.

Threshold

The compression threshold determines at which point the piano's signal begins getting compressed.

For piano compression, I like to set the threshold around the average level of the performance.

One way to get this is to see around 5dB of gain reduction when the compressor is working. As always, this obviously relates to the ratio of the compression itself which we'll cover next.

This means the peaks will be especially targeted, the average level will get a little glue, and the quietest parts will be left untouched. They'll actually be louder by way of the makeup gain that we or the compression plugin adds back.

By the way, set a harder knee so that the threshold is relatively strictly adhered to.

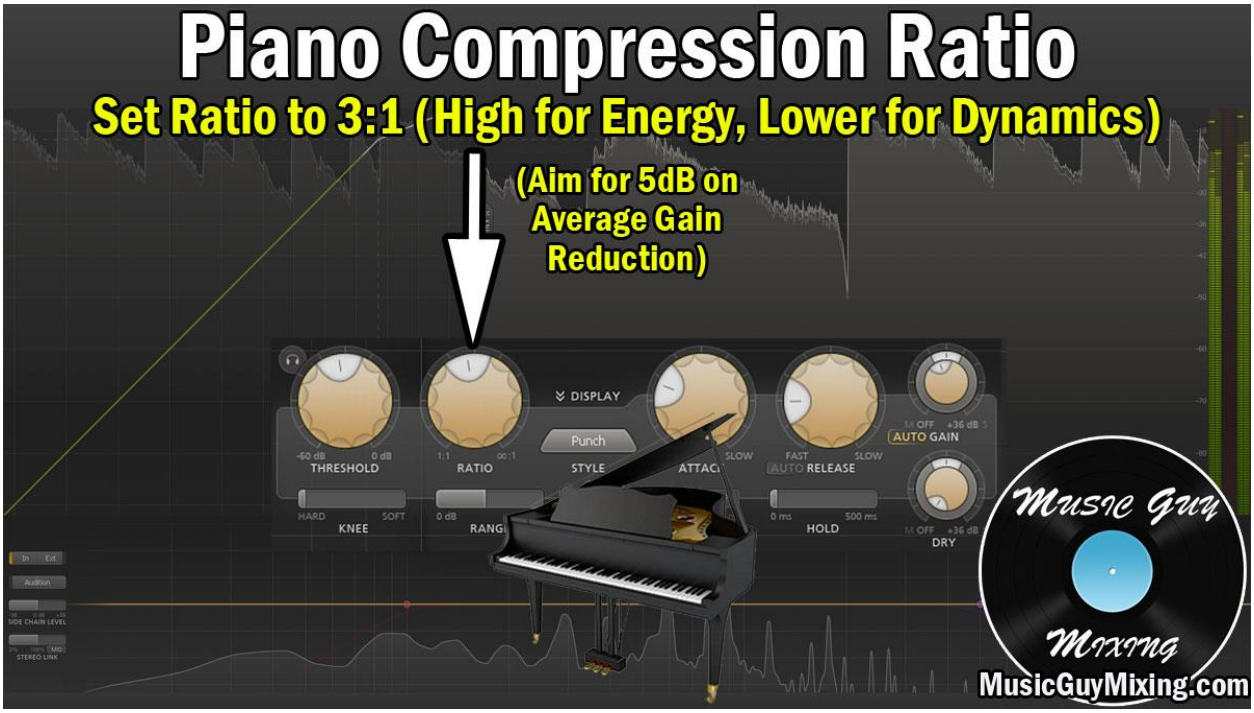
Piano has some of the loudest transients with a lot of attack, so it's all about getting those peaks a little more under control and enhancing the entire sound as a complete unit which is what these settings are geared toward.

As always, if you want more energy from the performance, turn the threshold a little lower than the average. If you want to preserve more dynamics, opt to go a bit higher than the average and focus on the peaks.

On a sparser mix where the piano plays a greater role, you might want to leave it more dynamic. This is because there is less to distract your listener's ear, so they'll be listening more for the natural dynamics of that performance. In busier mixes, you might want more energy to keep it noticeable even when everything else is playing.

Ratio

As a starting point, I like a 3:1 ratio for piano compression.



I explained what the compressor's ratio does more in depth, but this states how many dB over the threshold gets reduced to 1dB.

With a 3:1 ratio on our compressor, if the threshold gets exceeded by 3dB, it gets reduced to 1. If the threshold is exceeded by 9dB, it becomes 3dB. The louder parts get brought down so there's less of a difference between the quietest and loudest parts.

3:1 is a gentle to average rate of compression and I find it works well for creating energy while preserving dynamics. As always with dynamics, it's about finding that sweet spot of creating more cohesion without sucking the life out of it/squishing it.

And going back to the threshold, aim for 5dB of gain reduction on average after you have your threshold and ratio set. Depending on how dynamic your audio is, you should get close to this with the above threshold and this ratio.

And again, if you want more energy, raise the ratio. If you want to preserve more dynamics, lower the ratio.

Attack

The piano's compressor attack determines how soon after the threshold is exceeded that the audio begins getting compressed.

Piano has very clear and cutting transients, so we need to be careful not setting the attack too fast to dull the piano in the mix (unless that's what you're going for.

5ms is a good piano compression attack to allow the transients to pass through untouched.

This will keep the piano cutting through and visible in the mix while still giving us the above benefits of the compression.

If you're losing that bite on your piano, try rolling this back, but 5ms should work well.

Release

The last major setting for your piano compressor is its release. This tells the compressor how soon to stop

compressing once the audio has dropped below the threshold.

50ms is a good release time for piano compression to allow for a natural decay of the notes.

This also gives you the sustain and presence you want without stepping on next notes.

Try turning it down as low as 10ms if you've got a fast, Presto tempo performance, just be careful about hearing artifacts from that compressor which you can get when the release is too short.

Try adding another 50ms of “hold” time if you’re not getting the results you want with the release alone or you are hearing that chattering artifact. This will tell the compressor to keep compressing for 50ms even after the signal drops below the threshold.

Output Gain

You’re probably EXHAUSTED with my mentioning this, but I do it to convey how important matching the output gain to the input level.

This is really just a reminder of how important gain staging is for maintaining plenty of headroom in your mix, not to mention achieving the best results from each plugin in your processing chain.

Vocal Compressor #1

Given that the human voice is one of the most dynamic instruments, compression on vocals is a necessity.

Without the right compressor settings for vocals dialed in, you'll hear the compression working or you'll be losing critical words or syllables here or there.

Make sure you check out my vocal EQ guide to cut out all the stuff you don't want before you hit the compressor.

The Best Compressor for Vocals

Before we get into the compression settings, make sure you're using the right type of compressor on them. I recently did an overview on the best compressor for vocals and explained why a FET compressor like the 1176 or an optical compressor work so well on vocals.

With that in mind, I'll be offering the ideal compression settings for vocals both in 1176 and "conventional" compressor terms as they can vary slightly (as I'll illustrate as we get to those settings).

Threshold

On this first compressor, I like to set the threshold to around 10dB BELOW the average level.

This should achieve a gain reduction of 8-12dB on the peaks. Note that gain reduction is achieved through a combination of the threshold/input AND ratio, so let's get into that.

Ratio

One of the most important settings for vocal compression is setting a ratio at the right spot. The ratio is once again the degree the compressor is going to pull down those peaks of your vocals.

A high ratio affecting a lot of input will significantly reduce the dynamics in your vocal. This is the difference between the quietest and loudest parts.

With vocals, particularly on this first compressor in the chain I typically use a vocal compression ratio of 8:1.

This tames those peaks and helps keep the vocal under control and, as such, up front in the mix.

We'll use the next compressor in the chain (which we'll cover next) to smooth out the remaining peaks a bit more.

Attack

If you have the option to set a specific time, try starting with 10ms (or a 5 on an 1176) and move it left and right to hear the difference.

The signal will sound flat when you set that attack as fast as it will go. Slow it down a bit and you hear more of the bite of the vocals coming through before the compression snaps down.

Remember when I talked about how to use an 1176 compressor earlier that the attack and release numbers are counterintuitive on an 1176.

In going against the norm of every other compressor, a higher number on an 1176 means a faster compressor. The attack speed is represented with numbers between 1 and 7 with 7 being the fastest. So if you're compressing a vocal and you want it right up in your face, set it at or near 7. Generally though start with 5 and adjust as you monitor it accordingly.

The Arturia Comp FET-76 gratifyingly even makes it clear right on its interface that higher numbers denote faster attacks.

Release

The ideal release on vocal compression is more clear cut: you'll typically want a fast release. Try 50ms on a stock DAW compressor. Once again on an 1176, higher numbers means faster release times. Try beginning with 5 and adjust as necessary.

This creates a natural and smooth off-ramp for the compressor to let up and “release” the signal from its compression when it dips below the threshold.

Output Gain

Once again, turn up the output dial to put some volume back into the track to match the level of the input and keep that gain staging solid for the next processing.

Speaking of which, I mentioned serial compression earlier, and I actually recommend using more than one compressor on vocals, one after the other.

Again, the aim of this is to distribute the load between multiple compressors, yielding a more transparent compression.

The 1176 style compressor which I typically open with for compression on vocals does most of the heavy lifting for me.

After that, I like to put an optical or “opto” style compressor next in the chain.

Vocal Compressor #2 (Opto)

As any awkward jutting out peaks will likely have been addressed with the first compressor, this second compressor is just for a bit of glue.

Optical compressors like the Waves CLA-2A are perfect for this role.

As I mentioned earlier when I gave an overview of the optical compressor, you don't even need to worry about

settings outside of the threshold; attack, release, and ratio are all automatic.

Set the peak reduction to achieve 1-2dB of gain reduction on average and at most 3dB of gain reduction on any remaining areas which poke out.

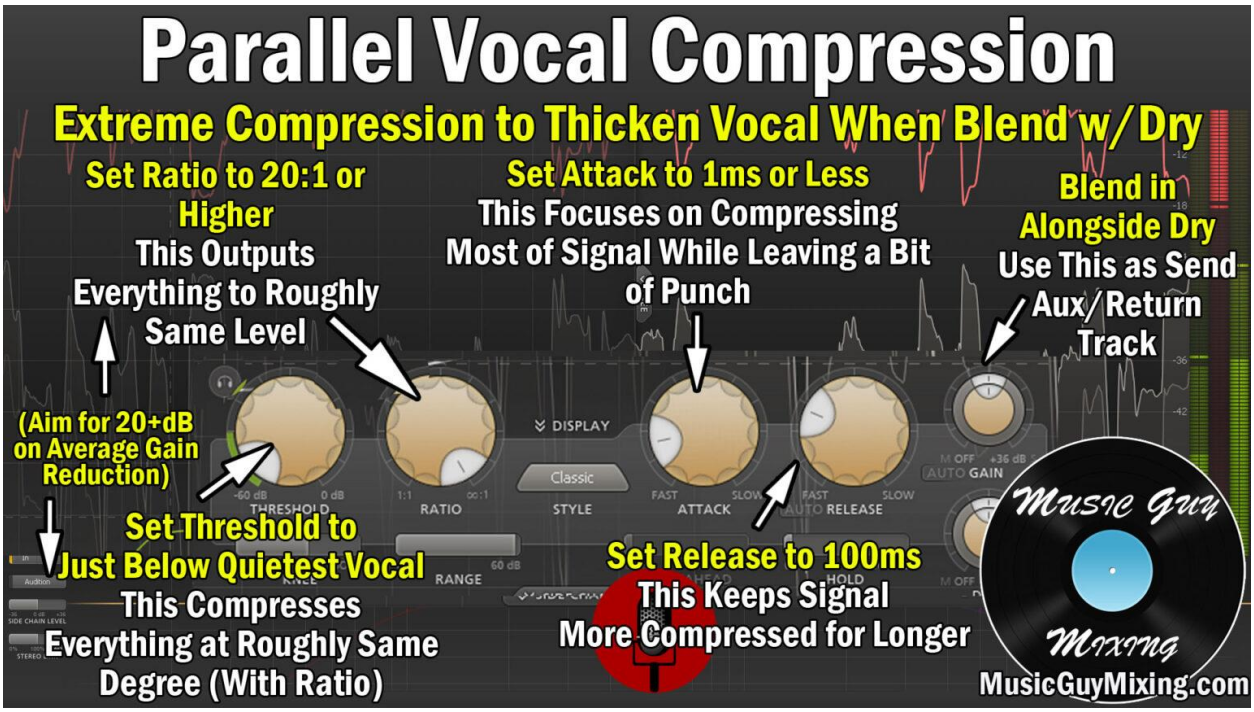
After all of these compressor settings for vocals are set, your vocal should be sitting in a good spot.

Follow it up with a bit of vocal automation in case any parts aren't poking through enough in the context of the rest of the mix and you should be good to go.

If you have an extremely dynamic vocal which still needs additional control after all of the above, check out my guide on dealing with especially dynamic vocals.

If you want to add another compressor for a touch more glue, drop it at the end of the chain after any additional processing.

Parallel Compressed Vocals



Whenever I need to thicken out my vocal or add more energy to it, I like to blend in a little parallel compressed vocal behind the “dry” version. By dry I simply mean the vocal we’ve been compressing with the last couple of compressors – we’re not dropping a compressor with these settings on top of it.

As I covered earlier, parallel compression refers to absolutely squashing your audio via a compressor with an extreme threshold and ratio, thereby completely removing its dynamics.

We then mix it in behind the dry version of the same track with subtlety.

The easiest and most efficient way to do this is to create an aux/return track in your DAW, drop a compressor on it, and dial in these settings on it.

Threshold

You want to set the threshold to just below the quietest instance of the vocal. Turning the threshold ALL the way down will end up boosting ambient/room noise which we don't want.

Ratio

With parallel vocal compression we want to use aggressive settings particularly on the threshold and ratio, **catching the entire vocal at a 20:1 or higher (or maxed) ratio.**

Attack

Set the attack to 1ms or less as we aren't as concerned with the transients with parallel compression because we're blending it in alongside the dry vocal.

Release

I like a release of 100ms to dissuade any noticeable pumping which is much more likely given the relatively aggressive settings.

Blending

Once we've gotten all of our settings where we want them for the parallel compression, we can now blend in as much of this parallel compression on deand using the send knob on our vocal.

Because we set the threshold to be relevant to our vocal levels, we can use this to blend in parallel compression on every single vocal track in our mix to taste.

Just be wary if you want to apply this parallel compressor to other types of audio, ensuring that the threshold is still effective and relevant for any track you feed to it via their respective send knobs.

Lastly, check out the rest of my vocal chain for tips on how to process your vocal from start to finish, not just the compression.

In Summary

As I mentioned early on, note that every specific cheat sheet I listed for each instrument is meant to be a general starting point, all be it an effective one.

The threshold obviously will always need to be adjusted, but depending on the dynamics of the performance of the audio as well as the results you're looking for, the rest of the settings may need to be tweaked here or there.

Just remember that more compression will result in more energy but at the expense of those natural dynamics of the audio itself.

Some songs or genres will benefit from more or less dynamics – always trust your ears.

Also make it a point to use reference tracks in your mix to help guide you.

This applies equally whether you're adjusting your compressor or applying any other processing to the tracks of your mix in order to keep your ears trained on your goal.

Also, one last time, be sure to grab my free EQ cheat sheet if you haven't already, as getting your audio properly EQ'd will make compressing them a lot easier, as well.

To your success in making better mixes!

-The Music Guy

P.S.

Don't forget to connect with me at these spots:

MusicGuyMixing.com – For Daily Mixing Tips or Audio Mixing Services Done by Me!

MusicGuyMastering.com – For Audio Mastering Services Done Exclusively by Me (get a free sample today).

MusicGuyOnline.com – For Songwriting and Recording Tips.