

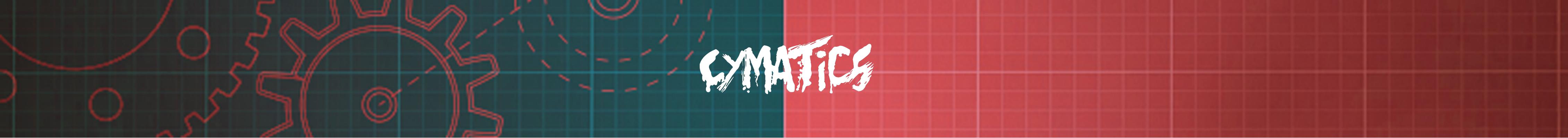


CYMATiCS

# THE MASTERING **BLUERPRINT**

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A complete guide to perfecting  
your master.



## Introduction

In simple words, Mastering is the final step in audio production. You can also think of it as simply enhancing the good qualities that your song may have.

This means that in order for you to do a great job finalizing your record, some preexisting conditions need to be met.

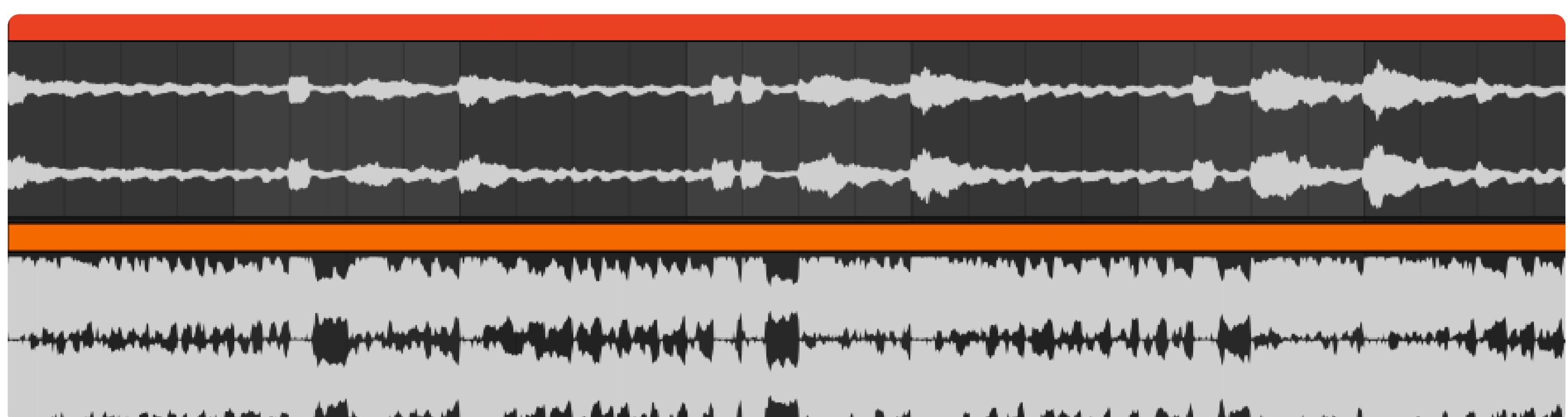
For starters, you need to have a good song and a great mixdown.

It's worth clarifying this from the get-go, because mastering isn't supposed to fix poor arrangement or bad mixing decisions. It's incredibly common to see beginner producers leave fairly simple mixing problems unaddressed because of this simple misconception.

As we just mentioned, mastering should be all about enhancing what's already there. It's just like the icing on a cake.

Unfortunately, no mixdown is perfect. It's absolutely fine if you address slight problems in your mix during your mastering session. However, if you're spending 90% of the time solving problems instead of highlighting the great parts of your mix, then it's simply better to go back to the drawing board.

So, the essence of mastering is basically getting your song to a commercial volume level, highlighting the great parts of your mix, and helping ensure your song will translate properly across multiple devices.



Just like mixing, mastering is a process that is really genre dependant. You wouldn't master a pop song in the exact same way you would master a hip-hop song. Each genre has quite different loudness requirements and different elements need to shine throughout the entirety of the song.

And not only that, genres keep evolving and so does the way people consume music and the available media. As we briefly mentioned above, mastering is also about ensuring proper playback translation across multiple sound systems.



## Introduction

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This is a key concept that we need to understand.

Let's think about Bass music in general for a moment. Its subgenres demand a clean, hard hitting, and ground shaking low end; While Progressive House on the other hand may need a finer balance between a punchy, stable low end with emotional upper mid range content.

We are going to reiterate that depending on your style of music, these qualities should already exist within your mix. Once again, mastering should be all about accentuating these qualities and not introducing them into your mix.

## Signal Chain Philosophy

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Having the "mix like there's no mastering" mindset will help you tremendously in this process. In reality, mastering will end up happening, but you should really focus most of your energy on having a mixdown that sounds like a finalized product.

**Assuming this is all true, mastering shouldn't take longer than an hour. A very simple and straightforward mastering chain could consist of:**

- A peak catching compressor
- Clean up/balancing equalization
- A stereo imager
- Limiter

If you're developing a somewhat bigger project, like an EP for example, you can have a slightly bigger chain across each track to ensure that the whole project sounds coherent.

**Pro Tip:** While developing bigger projects and after you've done mastering all of your tracks, line them up in your DAW so they play continuously as if it was a DJ mix (without the transitions).

*The overall volume of the EP, stereo image, and the overall brightness/darkness of the tracks should sound coherent and like they belong together. If they don't sound coherent one after the other, you need to go back and re-do the mastering on whichever song sounds off.*



# Signal Chain Philosophy

A more complex mastering chain could be comprised of:

- A peak catching compressor
- Clean up/balancing equalization
- Coloring EQ
- A stereo imager
- Saturation/Exciting
- A vintage compressor
- Limiter

As some final words for this section, if you're crafting a really ambitious project like an album, it's usually a great idea to have a mastering engineer do the process for you.

This isn't because you shouldn't do it, but usually it's just a really good idea to have a second set of ears to judge your work. It doesn't matter how good you are. When you work on a project of that magnitude for months, you may start losing perspective on your own compositions.

This isn't a bad idea either even for single releases. Get your own tracks mastered by someone else at least once and compare his or her result to yours. You may end up with a pleasant surprise.

Remember, you can't really tell how other people experience your music. The mastering engineer may offer you a different take on your song by highlighting different areas that you may not have previously thought of, or simply by colouring your song in certain way.

Also keep in mind there are people out there who focus their entire career on mastering this process. So, don't give up on mastering engineers just because you've encountered a few bad ones along the road.

Incredible mastering engineers are pricey, but their results really validate the price tag.

Now, let's break down every single element of a slightly more advanced mastering chain. This chain is useful mainly for electronic genres, but don't be afraid to try it with any other styles of music.

## Step 1: Peak Catching Compressor

The goal of this compressor is to tighten up your dynamics just a little bit. As expected, you shouldn't have big issues in this area if your mix is good to begin with.



## Step 1: Peak Catching Compressor

This compressor should also help you optimize your headroom just a little bit so you can limit even harder. Unfortunately, this is majorly due to the **loudness wars**—which we will talk about in a later section.

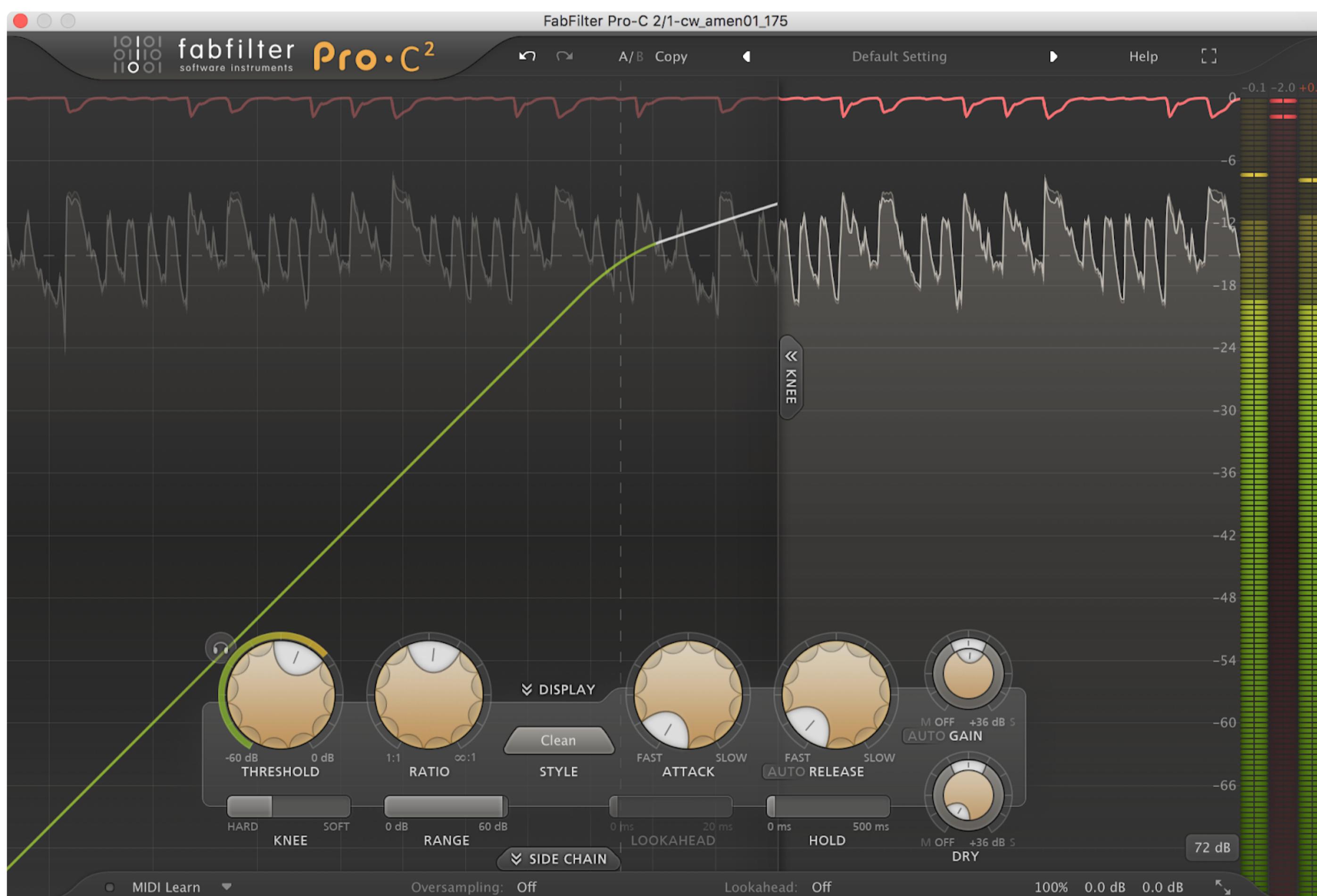
Loud sounds better to the human ear, and it's a psychoacoustic effect that we can't get rid off. Unfortunately, most of the time really loud songs that lack dynamics don't do justice to the actual musical composition.

Think about the album *Californication* by the Red Hot Chili Peppers. The original masters are considered some of the worst of all time, even though the songs are quite memorable.

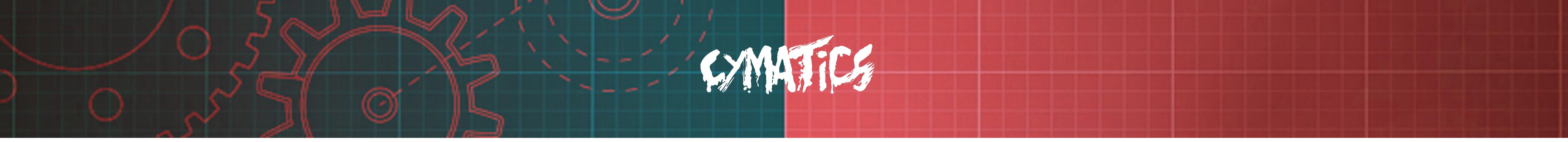
Start by listening to your song from beginning to end while keeping an eye on your meters. You don't want to have any sudden bursts in volume that eat your headroom only in certain parts of your song.

Use your best judgement, and if you assess that you need to tame your dynamics a tad bit, drop a peak catching compressor.

A really fast attack and release, with a ratio not higher than 3:1, barely any make up gain, and a relatively hard knee should be a really decent starting point.



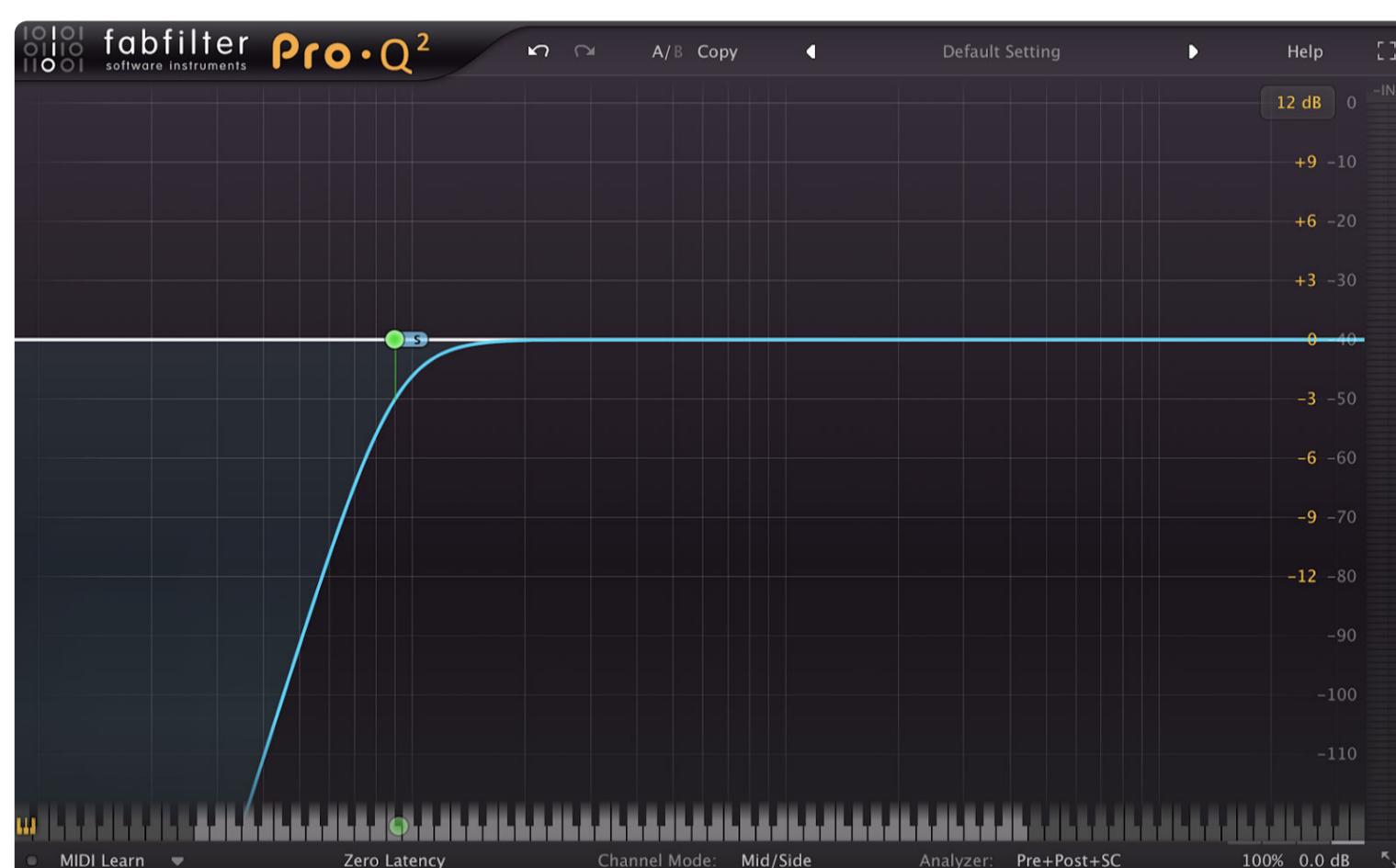
You shouldn't be getting more than 2 dB of gain reduction in this plugin, and that is already pushing it pretty hard. Remember, it's all about catching peaks, not hard compression.



## Step 2: Clean Up Equalization

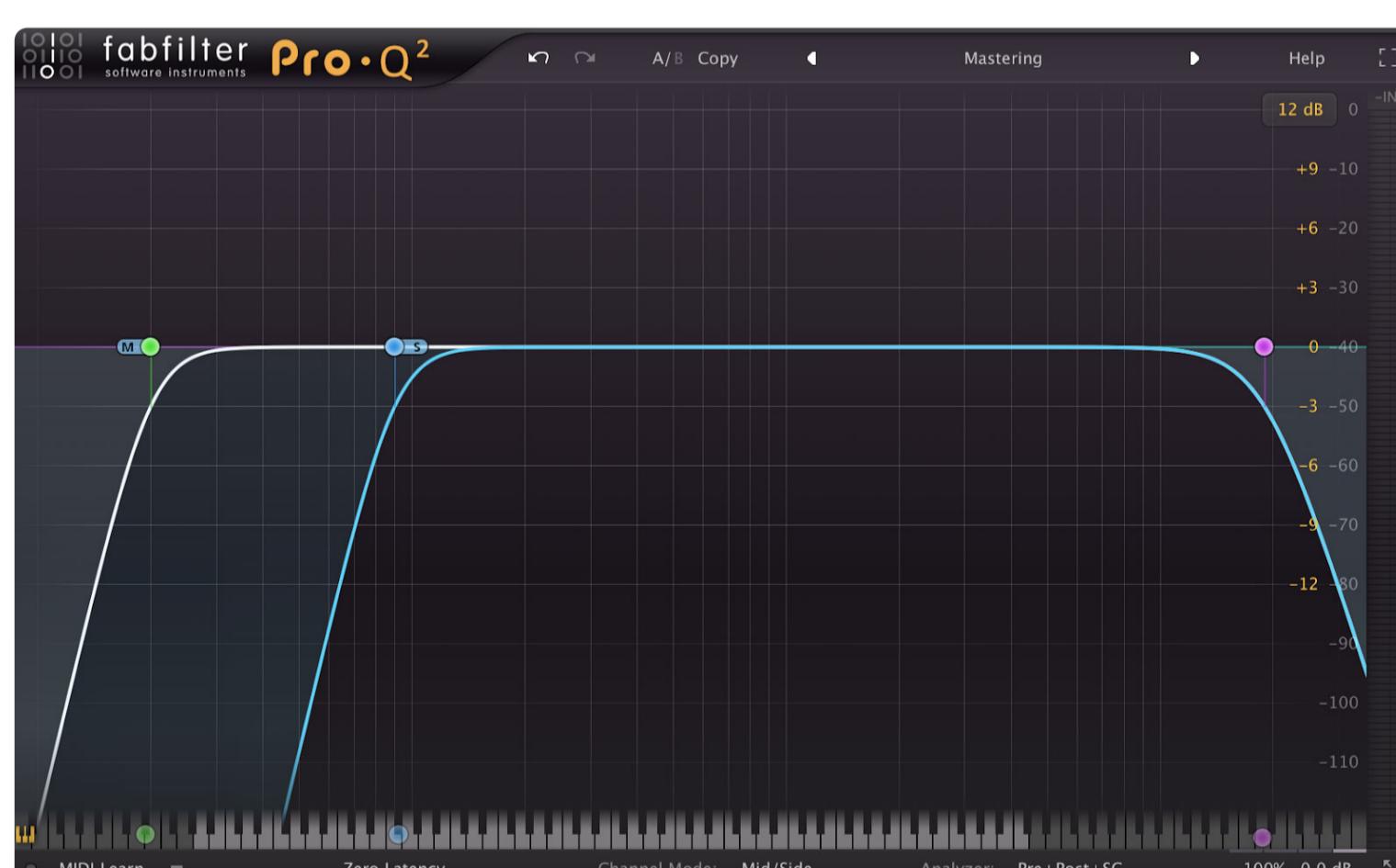
This step is all about taming, enhancing, accentuating, and getting rid of unnecessary frequencies.

For example, you may use a **mid/side** EQ to get rid of everything below 90 Hz on the sides to keep your low end centered and well defined.



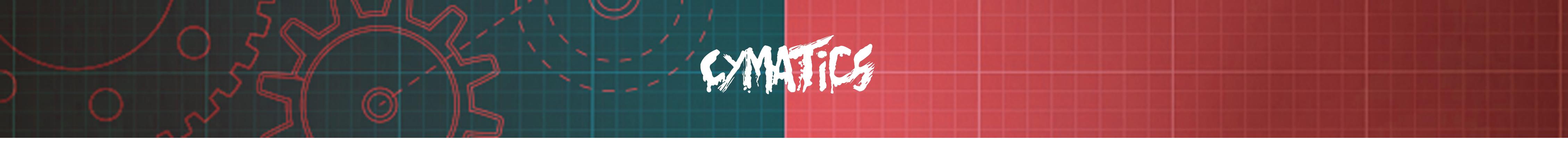
Subsequently, you need to get rid of all the sub frequencies below 20 Hz on the final output, as that is well below the human hearing range. You may not hear them or feel them, but your speakers are definitely trying to play them back while also creating unnecessary rumble.

To finalize this first step, you can also low pass the uppermost frequencies somewhere around 17 to 20 kHz. Even though some of these frequencies are within the human hearing range, it all depends on how airy and bright your style of music may be (think about lo-fi genres for a moment).



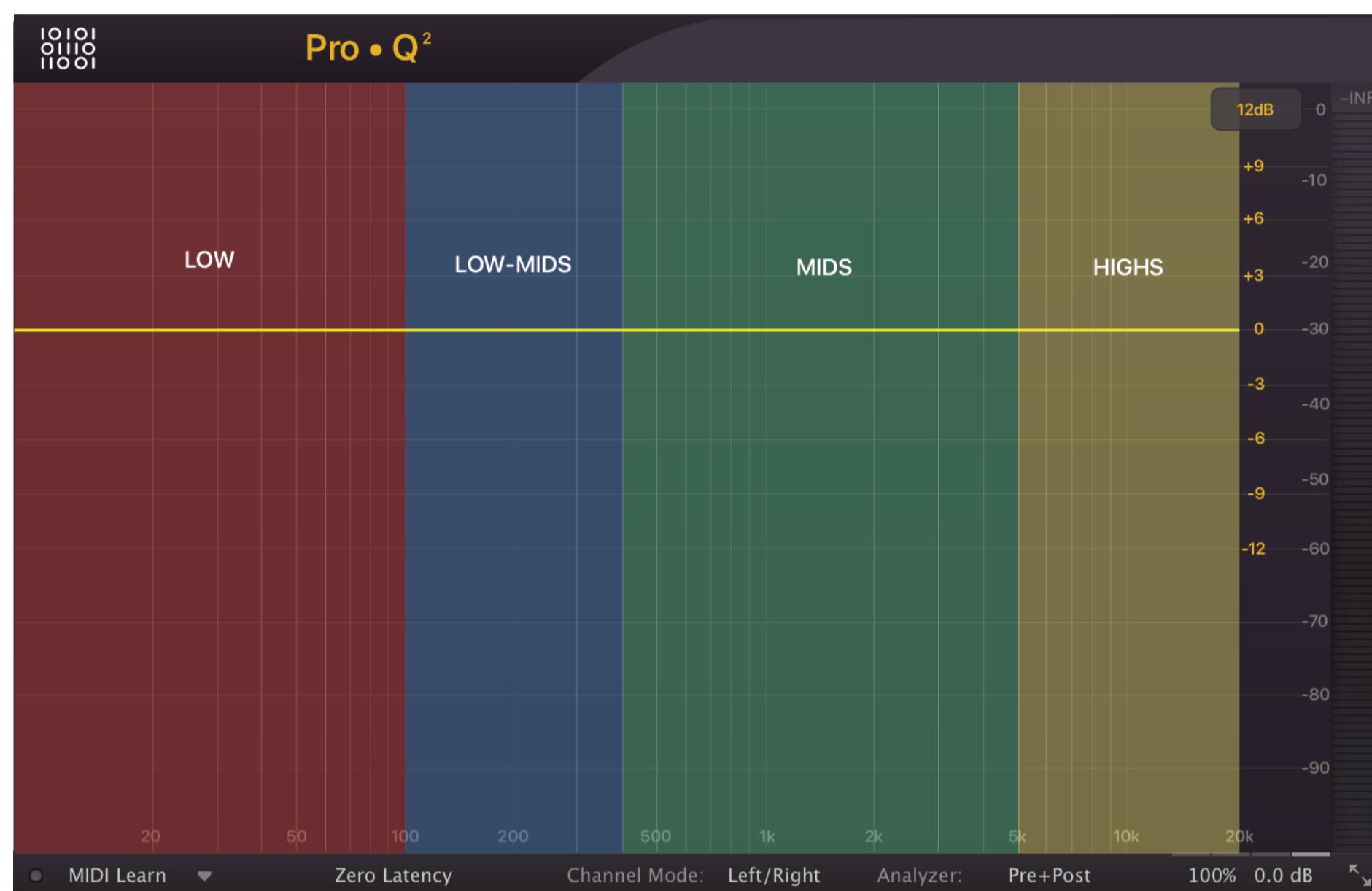
From here on, it's all about spotting problematic frequencies and creating a well balanced frequency response. Unfortunately, every song will have different issues based on its unique mixdown, so we can't really tell you exactly what you'll be facing.

Don't worry though, we can still provide you with some general guidelines and an overall EQing philosophy to approach this.



## Step 2: Clean Up Equalization

A good starting point is to visualize your frequency spectrum by areas and really focus on the style of music you're making.



If you're making Progressive House, for example, make sure that there's nothing harsh in the mid range and that it is a pretty smooth frequency band overall. Proceed to add or remove high frequency content to achieve the perfect amount of brightness and so on.

**This is a great moment to pull up a reference track.**

Note: Only use lossless files such as wav, aiff, or FLAC.

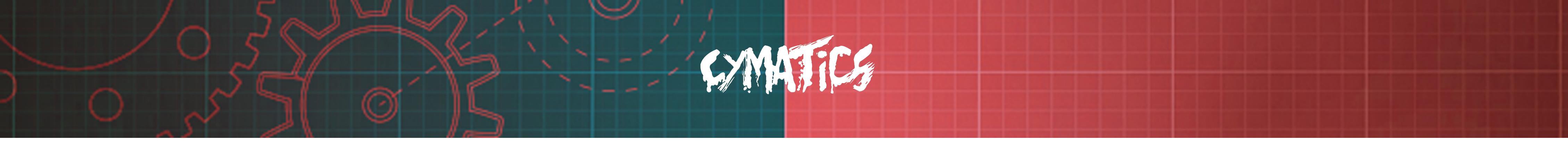
You may already have chosen a reference track since the very first moment you started creating your song, but if you haven't, don't worry at all.

Simply search for one track that is very similar to yours stylistically and that you personally think sounds great.

Once you have your reference track, as a general rule of thumb, drop it down in volume by the same amount of headroom that's available in your own track. So, if you have -6 dB of headroom in your song, drop the reference track by that same amount.

That's a great starting point to compensate for the added loudness your reference track will have; In this way, you shouldn't get tricked as easily by the psychoacoustic effect, and it will be the same amount of gain you will be adding to your own track anyways.

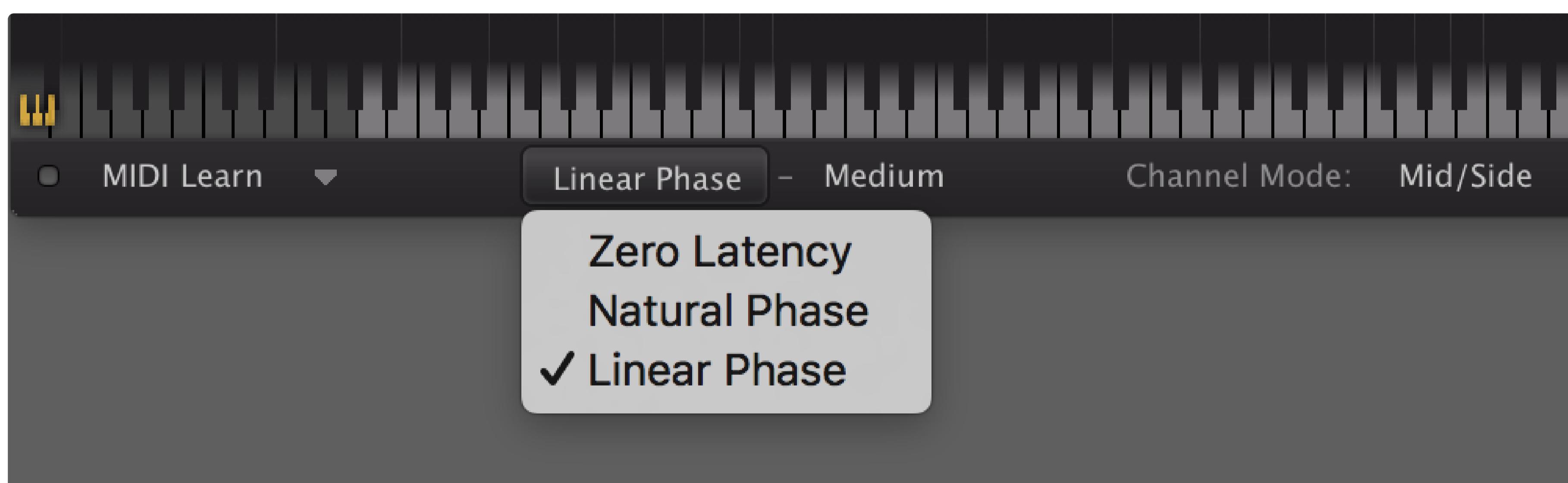
You can filter each frequency band with a low pass, a high pass, and a bandpass filter on your reference track and listen to what elements are overlapping and where. If you spot really notable differences, it may be a good idea to go back to the mixing stage and keep referencing that song.



## Step 2: Clean Up Equalization

However, if you assess that both mixes are quite similar, you can simply use the EQ to try and match your reference track. Keep the following things in mind while EQing:

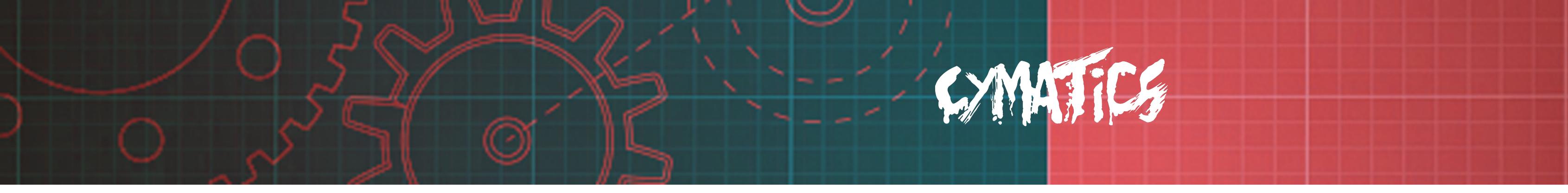
- Do not cut or boost any given frequency band more than 4 dB. That's already way too aggressive for the mastering stage.
- If you need to accentuate any frequency band, try cutting areas around it first before boosting.
- Use broad Q's for boosting while using really surgical bandwidths for cutting.
- When you're about to print your final master, make sure to change your EQ to "Linear Phase" mode if it has one available.



FabFilter's Linear Phase mode.

**Note:** Explaining the importance of using a *Linear Phase mode* on transparent EQs while mastering is outside the scope of this book. However, we can't stress enough the importance of researching this topic on your own.

Once you correct any possible issues and achieve a more balanced frequency response, it's time to move forward and add some coloring EQ.



## Step 3: Coloration EQ

This step isn't imperative and you shouldn't do it every single time you master a song, especially if it's for a prospective client that has very specific needs.

This step is all about enhancing with colouring EQs the best parts of your song to create a richer sound. This doesn't mean that you shouldn't do cuts with these EQ's either. It's just about the general mindset that you should have.

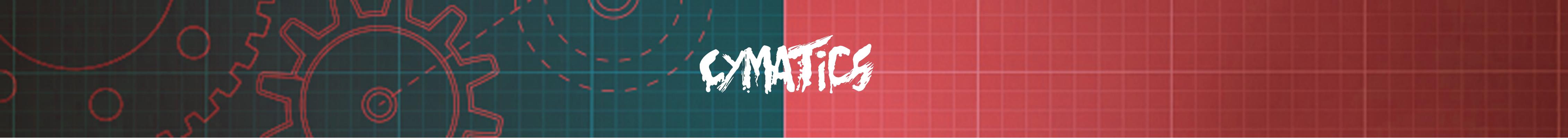
There is also no right or wrong way to do this. A lot of trial and error is actually involved in this step. Just make sure that you don't ruin the frequency balance that you might have achieved in the previous step.

It's also worth noting that if it isn't advised to do aggressive adjustments with transparent EQs, then you shouldn't do aggressive boosts or cuts with this type of EQs either.

You need to research which coloration EQs are the most common ones within your style of music, as there is a myriad of mastering plugins and hardware units out there that aren't really useful across different styles of music.

Some of the most common ones that are extremely useful for multiple styles of music are iZotope's Ozone Vintage EQs, Waves' Pultec emulations, the API collection—either by Waves or UAD—and the SSL emulations by Waves.



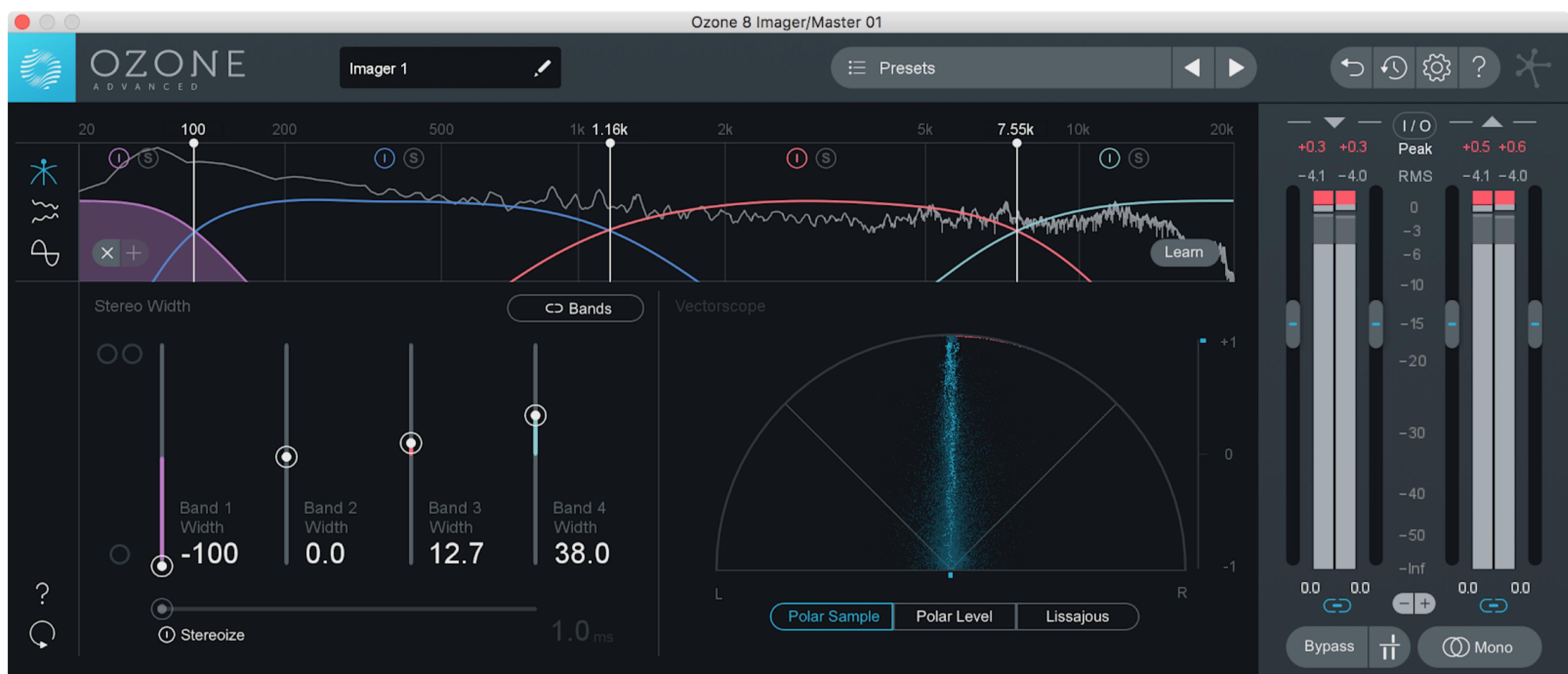


## Step 4: Stereo Imaging

Using a stereo imager isn't always necessary either. A great amount of modern dance tracks are made extremely wide via mid side processing, and this is a good opportunity to enhance that.

Once again, mastering should be all about minor corrections while focusing on enhancing what's already there.

Another good idea while being at this specific step of the entire mastering process is to make everything below 100 Hz mono. This a safe bet and a great starting point for most genres of music.



To finalize this brief section, we need to tell you to be quite mindful about pushing your imager way too hard, as overdoing it may completely ruin your existing stereo image and cause major phasing problems.

Phasing problems are a definite no in most stages of the production process and especially in mastering.



## Step 5: Saturation/Exciting

Sometimes adding gentle saturation or harmonic excitement is just what your song may need to match your reference track... but there's a catch.

You need to be extremely careful in this stage. You may already have added tons of processing to your individual channels while arranging your song plus whatever you did on the mixing stage.

It is **extremely easy** to over do it and just throw away all of your hard work. As a rule of thumb, push the saturator/exciter to a point where the effect is fairly noticeable, and then proceed to bring it down to a point where the result is more **felt** than **heard**.

Alternatively, before you push the plugin down, you can take some time to listen to the whole song with the saturator engaged. This will bring to the forefront any mixing issues or problematic frequencies that you may not even be aware of.

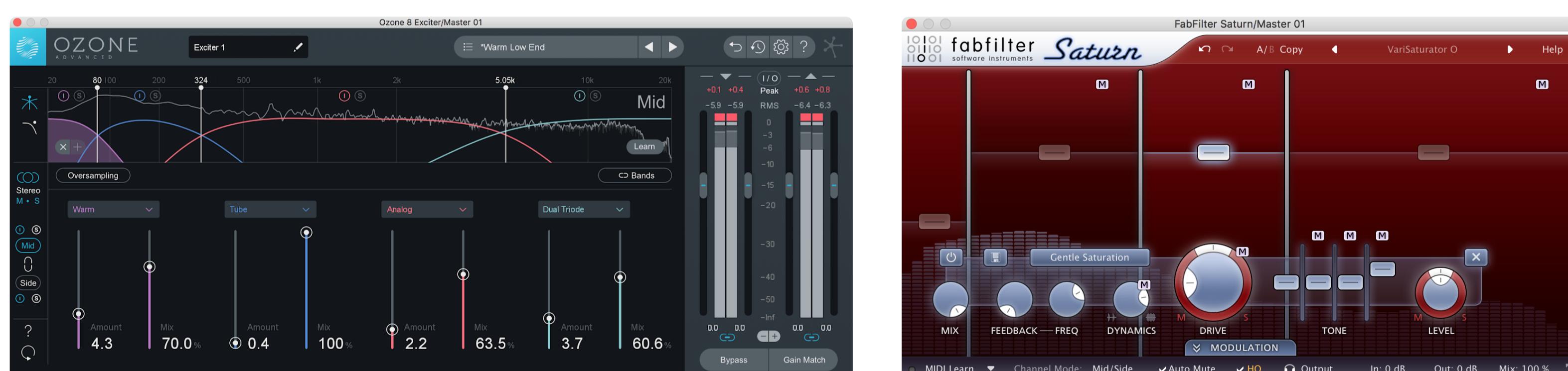
After you do this, it is imperative that you A/B your song with your reference track. We'll say it once again, because it is extremely easy to ruin your entire track, especially when you start losing perspective of your own song.

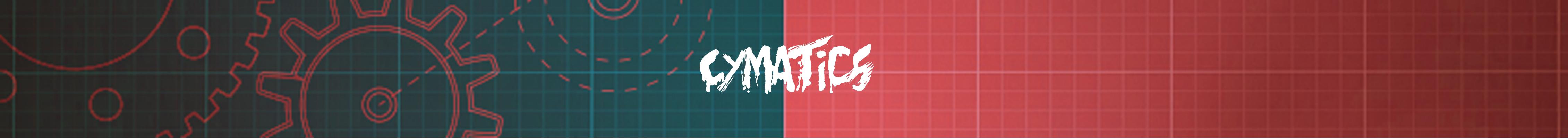
This process may eat a couple of dBs in your headroom, so be aware that loudness may be tricking you into thinking that it's better.

This is another reason why having a mastering engineer in really ambitious projects isn't a bad idea. A fresh set of ears that understands your creative vision is one of the best types of help you could possibly get.

The bottom line is: you need to ensure that this effect is actually bringing positive results to your entire track. Never stop comparing your results with your reference track.

If you have multiple saturation plugins available, we also suggest experimenting a little bit with all of them. Multi-band saturators and excitors such as Ozone and FabFilter's Saturn are some of the best ones available.





## Step 6: Vintage Compression

Vintage or coloring compression, in a nutshell, is having the exact same mindset of **coloration EQ plus glue compression**.

You can even use the famous glue compressor or any SSL emulation of your preference to achieve this. The whole point is to add another layer or pinch of coloration while gluing everything together one last time.

You don't have to use those specific compressors though. There are hundreds of compressors out there with mastering capabilities and unique sonic qualities.

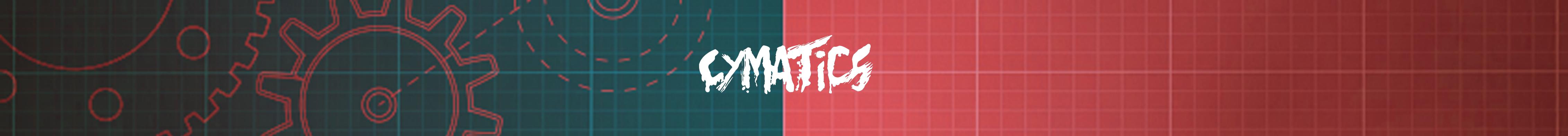
This is a very fun rabbit hole to go down into. Research some of the world's most expensive plugins and hardware units.



These expensive compressors aren't only for coloring or gluing though. For their price they obviously come ready to handle multiple tasks and come equipped with multiple functionalities. Although, this is one of the preferred uses for most electronic music producers.

As a general rule of thumb you don't want fast attacks settings on these compressors. The release may vary depending on your song, using small ratios, and neither a lot of gain reduction.

Remember, you're coloring and maybe gluing your whole track together. You're not dealing with dynamics.



## Step 7: Limiting & Loudness Wars

Limiting is the final stage in the mastering process.

The attack and release settings are extremely dependant on your song and even the genre, so you definitely need to experiment with those. Try starting off by browsing some presets your limiter may have and use some critical thinking to figure out why they may be setup in that way.

Both fast and slow attack and release settings, and even unlinking the stereo channels is quite useful in certain scenarios.

If you only have the stock limiter of your DAW available, that's good enough. Load the default preset or its initialized state and focus on the output, threshold, and gain.



Keep your limiter's output at -0.01 to -0.04 dB to prevent **inter-sample peaks**, and start pushing the limiters gain up. Keep an eye on your RMS meters

**Pro Tip:** Usually, you won't need more than 6-10 dB of added gain. You can also try staged limiting and spread that amount between multiple limiters for even more transparent results.



## Step 7: Limiting & Loudness Wars

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If you're mastering for loudness, try to push your song to its limit and see how loud it can go before the low end starts to crumble and your high end begins distorting.

We would only like to say that achieving anything above **-4 RMS** is definitely possible, but it's most likely doing a disservice to your own track. Music needs a minimum amount of dynamics just because of how our brain interprets sounds, and this is pretty much around its upper limit.

If you want to go beyond that and you firmly believe that it sounds good, go for it. Just make sure it's not producers ego getting in your way while boasting how loud your track is.

This is something that thousands of producers and engineers believe is doing a disservice to music as a whole.

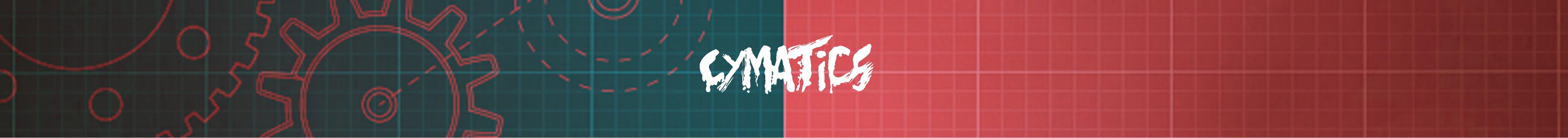
We found out that to us humans, loud simply sounds better. With the introduction of digital signal processing, we kept finding ways to make everything louder to the point of sacrificing quality for levels.

And now, you also need to be aware of that streaming services have begun normalizing tracks. Nowadays, it isn't enough to master your song once. If you're planning to upload it to streaming services, you need to have a master catered to streaming platforms.

This is one of the first steps that certain areas of the music industry have begun to implement to start fighting back against this whole loudness wars issue that has been going on for decades.

We could actually do an entire manual that talks about "the new" loudness metering systems (at least in music) and the reason why this is beneficial.

So we highly encourage you to do additional research on your own, but **-14 LUFS** is an amazing value for most streaming services, one of them being Spotify.



## Final Thoughts

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This is it!

In this book we provided you with pretty in-depth information about mastering. As we previously mentioned, mastering is an art form on its own, some people spend a lifetime becoming experts in this field without even creating a lot of music for themselves.

Trust us, a lot of engineers actually really value helping other artists bring their creative vision to life.

On the other hand, you would be surprised by how many successful singles have been mastered with a pretty similar chain to the one we just provided you with.

And this brings us to our final point. We highly encourage you to experiment with the order of the devices in this mastering chain while also adding or removing any type of processors.

This mastering chain isn't definitive or be all and end all, it's just a common setting that works well for multiple styles of music.

For example, try doing corrective EQ before doing any sort of dynamic control. There isn't really a right or wrong way to do this. You just have to be aware of what you're trying to achieve, reference professional tracks, and experiment endlessly.

It is very common within the dance music community for producers to develop their own mastering chains, which actually contributes a little bit to their own unique sound.

Just don't forget that a decent amount of mastering engineers out there are also worth their price tag. Some of them even own hardware units and acoustically treated spaces that most producers could only ever dream of using. A second set of ears who understands your creative vision is one of the most valuable assets you could ever have.

Let someone else be involved in one of your projects at least a few times. As we initially mentioned, you may end up with a very pleasant result.

Happy mastering!

# The Mastering Checklist

## Before you start: Pick a reference track & start a new session

Pick one track that is very similar to yours stylistically; you may already have one if you referenced a track since the creative stage.

Start a brand new session and put it in another channel. As general rule of thumb, lower it by the same amount of headroom you have available in your track to compensate for loudness.

You should only have 2 channels in this session, your reference track and a print of your mixdown.

### Step 1: Assess Dynamics

- Does your track have loose dynamics or rogue transients at any point during your song? Do you feel like it could be tighter, or do you simply want some extra headroom?
- Use a peak catching compressor.

### Step 2: Clean Up Equalization

- Get rid of unnecessary frequencies on both sides of the frequency spectrum, tame harsh frequency bands, and try to achieve a proper frequency response/balance using your reference track.

### Step 3: Coloration EQ

- This step isn't imperative. Do you feel like you could add richness or some coloration to your song? Experiment with vintage EQs and try to get a richer sound without ruining the balance you might have achieved in the previous step.

### Step 4: Stereo Imaging

- This step isn't necessary either in every single mastering session. Listen to your reference track and use your best judgement to determine if you need to enhance your stereo image.

Remember to never push stereo imagers too hard, as they could completely ruin the stereo image you built during the mixing stage. If you didn't make your sub frequencies mono during your mixing stage, this is a great time to do so.

### Step 5: Saturation/Exciting

- Does your song need some extra energy or overall brightness? Consider using mild saturation or harmonic excitement to give your song the finishing touch it may need.

Remember to be extra careful in this step though. It's very likely that there's already a lot of processing in your track as a whole; Overdoing this can ruin your entire song very easily.

### Step 6: Vintage Compression

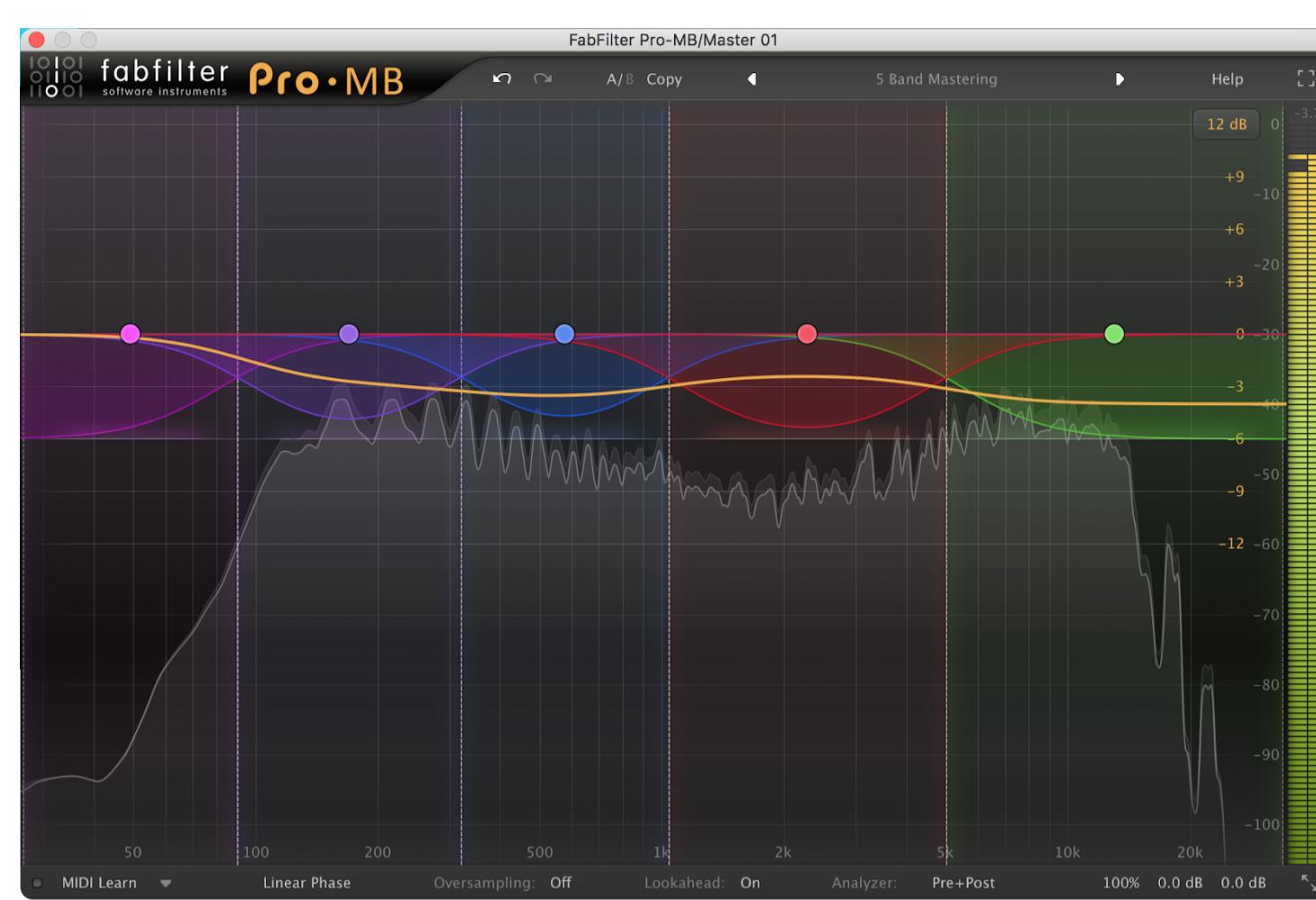
- Vintage compression could be seen as the cherry on a cake. If you feel like you could still add some final glue to your entire song or an extra layer of color, feel free to experiment with very light compression with any non-transparent compressor.

### Step 7: Limiting

- Reference the loudness levels of your reference track and use that as a benchmark. We don't recommend going above -4 RMS, but the final decision is up to you.

Feel free to experiment with staged limiting to achieve even more transparent results; Don't forget to change the output of the last limiter to somewhere around -0.01 to -0.04 dB and simply push the gain up.

# Top 10 Mastering Plugins



## 7. FabFilter Pro-MB

Multiband compression can often be seen as a finer detail, not worth wrangling until the late stages of a track, if not the mastering stage. But with Pro-MB's intuitive controls, producers and engineers of all levels can enjoy the benefits it brings, even before the mastering stage.

Pro-MB is also unique in that it is a complete dynamics processor. This means that it allows for various types of dynamics processing, including compression, expansion, limiting, and gating.

[BUY NOW](#)


## 8. UAD Manley Massive Passive

This incredible equalizer is based on Manley's classic Massive Passive EQ. With multiple emulations available by different plugin developers, the audio community still agrees that UAD's emulation is the most faithful one out of all of them.

This EQ has two modes available, a standard version and a mastering version. Both have different gain ranges, filter frequencies, four bands of parametric EQs, and stepped filter frequencies with individually selectable filter shapes.

[BUY NOW](#)


## 9. Shadow Hills Mastering Compressor

The Shadow Hills Mastering Compressor is an extremely versatile unit that comes built-in with multiple compression modes.

The transformer mode is incredibly good at adding pleasant distortion that is usually characteristic of this type of components. Its optic compression mode is quite handy for any type of dynamic control, while the VCA mode works superbly as a glue compressor.

[BUY NOW](#)

# Top 10 Mastering Plugins



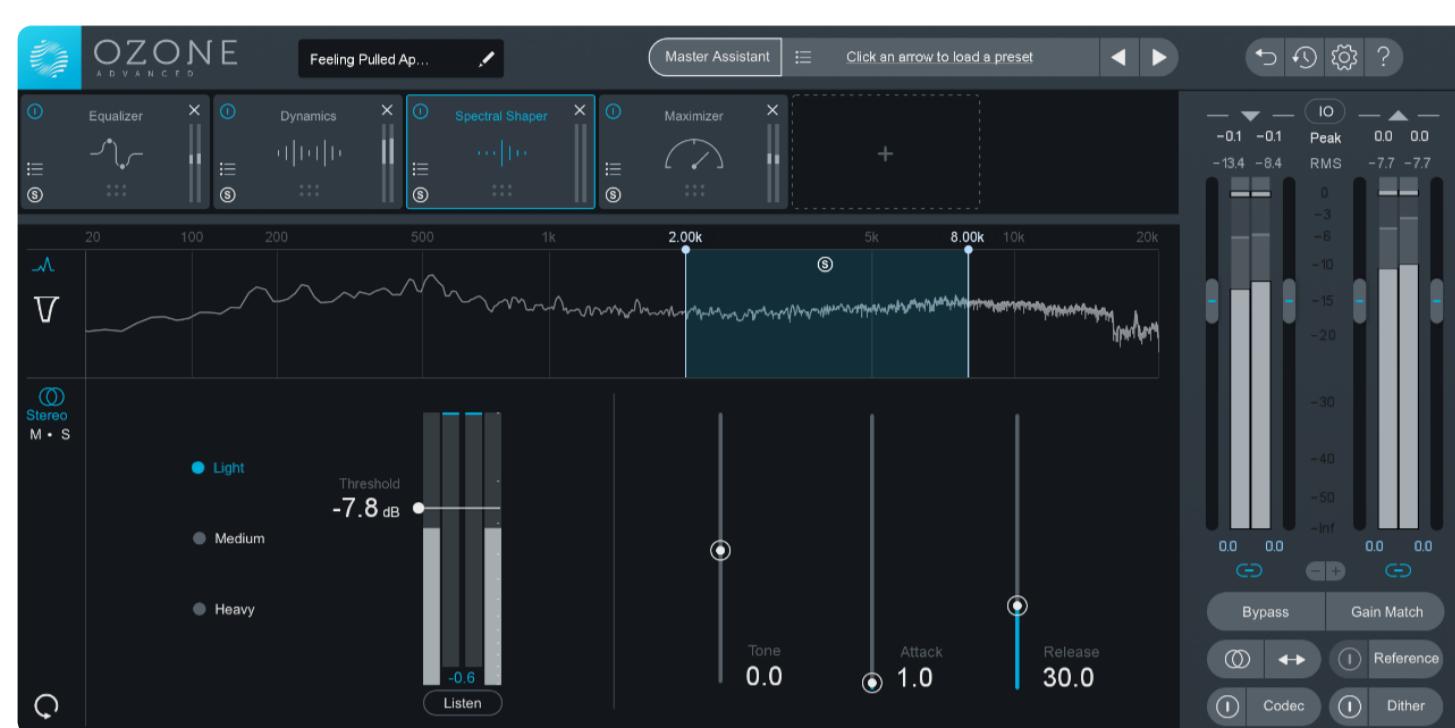
## 10. UAD Pultec Passive EQ Collection

The Pultec EQ's are arguably some of the most common hardware units—or at least the plugin versions—that you will find in the toolbox of almost every successful producer all around the world.

These EQ's will give you that signature smooth-as-silk vintage tone in whatever you use it on, from individual tracks, to busses, or even your master bus. You can dial up extreme levels of boosts and cuts while staying natural and musical.

[BUY NOW](#)

# Top 10 Mastering Plugins



## 1. iZotope Ozone 8

iZotope's Ozone 8 is perfect for those of you looking for the ideal audio mastering experience. This mastering suite includes everything you need to prepare a track for commercial distribution.

It features multiple EQs, compressors, imagers, limiters, and much more. The advanced version even features quite a few modules that are helpful in the mixing process of your track pre-mastering.

[BUY NOW](#)


## 2. FabFilter Pro L-2

FabFilter is widely known for making some of the best mixing and mastering plugins on the market, and their brand new Pro L-2 is no exception.

This limiter has multiple added functionalities such as unity gain, limiting audition, target loudness meters (LUFS included), and an astounding amount of 8 different limiter styles.

[BUY NOW](#)


## 3. A.O.M Invisible Limiter

If what you're looking for is a brickwall limiter to raise the volume and keep the details of your track intact, without the hassle of tweaking many knobs, this is the tool for you.

A.O.M went above and beyond with this plugin, as it has the reputation of being one of the most transparent and clear sounding limiters on the entire market.

[BUY NOW](#)

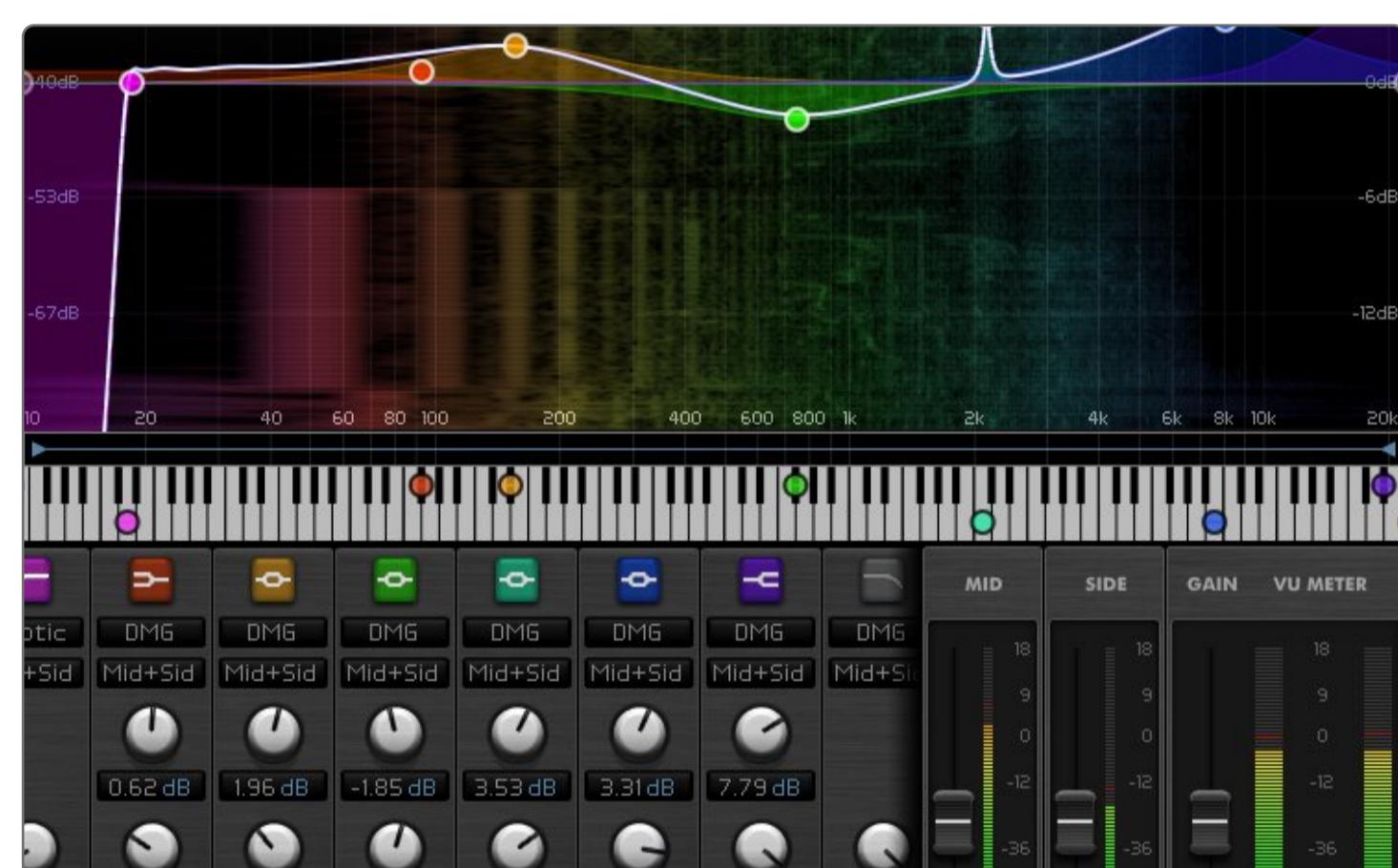
# Top 10 Mastering Plugins



## 4. Kazrog KClip 3

KClip 3 is the newest version of Kazrog's highly-praised multi-band saturator, mastering clipper, and loudness meter.

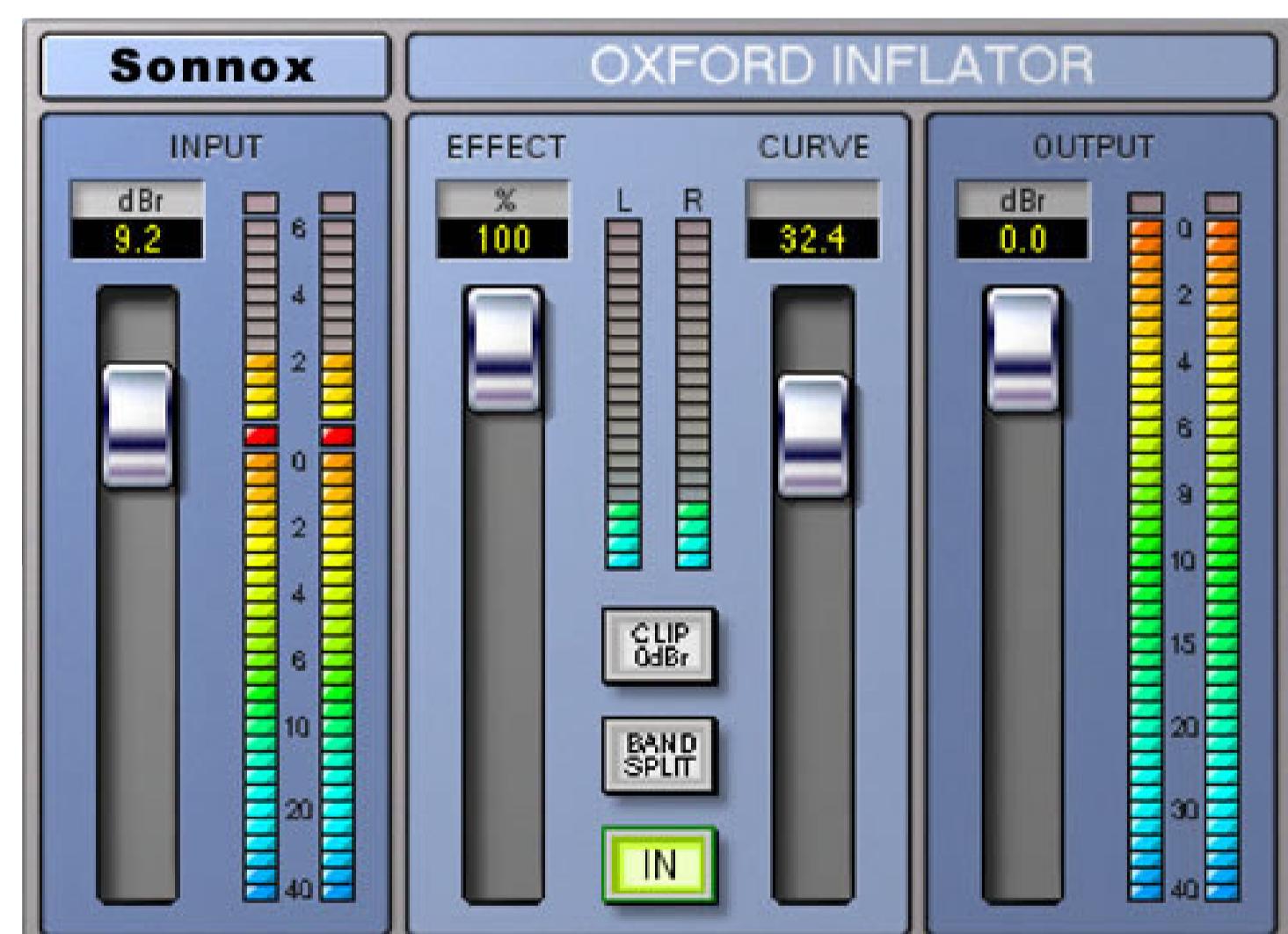
Kazrog is a highly respected developer within the audio engineering community, and with this unbelievable plugin you get an all-in-one solution with the price tag to match.

[BUY NOW](#)


## 5. DMG Equilibrium

Multiple producers and engineers argue that once you get past the learning curve this EQ has, you won't ever feel the need to buy any other equalizer again.

Developed by DMG Audio, Equilibrium offers crystal clear digital curves, circuit models of vintage EQs, and multiple engineering filters.

[BUY NOW](#)


## 6. Sonnox Oxford Inflator

The Oxford Inflator isn't a conventional limiter, as it is in a way some kind of distortion generator that gives the impression of greater loudness by producing harmonic content that we naturally associate with loud signals.

The main downside of this plugin is that you need an iLok dongle to be able to use it or own a Universal Audio soundcard.

[BUY NOW](#)