

# Audio Mastering Secrets

The Pros Don't Want You To Know

By John Rogers



**AudioMasteringSecrets.com**

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## Who This Book Is For

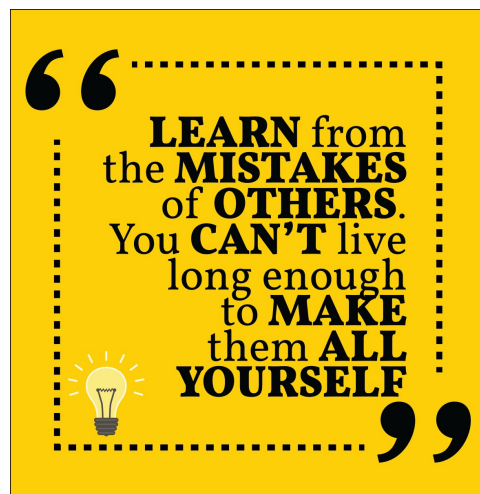
Someone who wants to learn how to *correctly* master audio to commercial radio standards, either for themselves and their own music, or to gain the skills needed to earn a living online.

You want all the information needed to become a great audio mastering engineer, presented in a way that's easy to understand.

**I wrote this entire book in simple plain English (layman's terms).** I eliminated all the words you never heard of and hi-tech jargon, so anyone at any level can understand and learn from this book as well.

You've invested *hundreds*, if not *thousands*, of hours into your music. If you're serious about it, **now's the time to make a very small financial investment in this book so your music will sound the very best it can!**

**I wrote this book so you can quickly learn (in a matter of weeks) the techniques, tips, and secrets that took me over 20 years to learn!**



## What You Will Learn From This Book

I love the saying, "If you *give* a man a fish he eats for a *day*, but if you *teach* a man how to fish he eats for a *lifetime*!"

**Well, from this book you will learn how to professionally master audio for a lifetime!** Then you can properly master your entire CD, your friend's CD, even open your own audio mastering business. If you're already mastering audio at your own recording studio, I'm sure you will still learn a lot from this book.

**This book is a learning guide, filled with in-depth information.** I wrote it from the perspective of a recording studio owner who's worked with many satisfied clients.

One reason I did this is because I wanted to cover *only* typical situations and scenarios you will experience while audio mastering, not a hundred extra pages of theory and worthless topics you'll *never* use. I included only the information you need to know.

**Audio mastering is a highly technical field.** There are 1,000's of different effects combinations and sonic scenarios. And when you first start out in audio mastering, you'll trial and error your way through hundreds of combinations for each song. It's very easy to get lost in technology and become over-whelmed.

In this book, I simplify the entire audio mastering process down to a handful of basic concepts and effects combinations, detailing only the ones you need to properly master music.

**Also, this book was updated in 2021**

It covers *current* mastering techniques using *up to date* gear. Since 90% of the current software plugins weren't available at that time, books written around 2007 or earlier are primarily analog gear using old school mastering techniques.

**In this book, I explain:**

- *What* your mastering goals are.
- *How* to use the processors involved in audio mastering.
- *When* to use them.
- *Why* you are using them.

I start out with basic terms, audio mastering laws and procedures before moving on to advanced sonic adjustment techniques and detailed step-by-step instructions.

I not only use pictures, but also incorporate a few online sound and video references. **Everything you need to become a great audio mastering engineer!**

**Important Note** - Please read this book in its entirety. I try to repeat the most important concepts and tips, but sometimes I mention very important information *only once*. If you read only 75% of this book (or less), **you will miss out on a lot of great stuff!**

## About The Author

Hello, my name is John Rogers. I'm a professional sound engineer and have been mixing and mastering at my Las Vegas studio [JRmastering.com](http://JRmastering.com), since 1999. **I've worked with over 8,000 highly satisfied customers (that's 6-8 per week) in every genre and style imaginable.**

**Everything written in this book is based on these real-world results.** Not on biased opinions, what a teacher or friend told me, what I read in another book, etc. My techniques and philosophies are backed by the great experiences of thousands of highly satisfied clients, many repeat customers and record label projects.

**I'm only telling you this because I want you to know you will be learning from someone whose mastering techniques are proven to be highly successful.**

I've worked with several Grammy nominees and award winners (Bowling for Soup, Sir Charles Jones, Mary J Blige, Dionne Warwick, Ryan Saranich).

I've also mastered many billboard top 10 songs in Europe (Smiley, Nyls, Andra, Miss Mary, Mihai Ristea), movie soundtracks, videos that have appeared on MTV, and dance/EDM music that has been played in dance clubs all around the world.

After receiving *thousands* of highly favorable email comments from my clients, most not believing what I achieved with their music, I realized I have knowledge that I can pass on to anyone who wants to learn it. **This is why I wrote this book for you.**

**Learn in a matter of weeks what took me over 20 long years to learn. Let's get started!**



# AUDIO MASTERING FAQs

Here are answers to a few of the most common audio mastering questions.

## What Is Audio Mastering?

I've seen a lot of different answers on the Internet to this simple question. Some were pretty technical and confusing.

A lot of people think audio mastering is *only* making all the songs on a CD a comparable volume level. Yes, this *is* done in mastering, but it's only one of many processes, not the *only* process.

The simple answer – **Audio mastering is applying effects to a full song mix (on the stereo/main out bus), in efforts to replicate the sonic qualities of a well mastered industry standard commercial song.**

In mastering, you're adding effects to the entire song as a whole. Effects such as compression, spectral enhancement, EQ, etc.

An example of a mastering process is adding bass to a song you're listening to on your car stereo. When you add bass, the entire song gets it. You *can't* add bass to *only* the vocal track. This is comparable to a mastering EQ process because it affects the *entire* song.

## What's The Main Goal In Audio Mastering?

**Your main goal in audio mastering is to replicate the sonic qualities of a well professionally mastered commercial song, in the same genre and style as the song mix you are working on.**

Yes, everyone has their own slight preference adjustments like a little more bass, brightness, etc., **but overall you want to be at least 80% similar to the current industry standard.** The *only* exception is if a client specifically requests an old school master. If that's the case, then you're going to have to replicate the sonic qualities of songs from a past era.

## Why Do Songs Need To Be Mastered?

I've seen this question on the Internet many times. The answer I always see is "Because all songs on the radio have been professionally mastered, yours should be too." **This is a true fact, but not an answer.**

**Yes, your songs need to be mastered because you want them to have the same qualities of a well professionally mastered commercial song, but this can *only* be achieved by using effects on the stereo/main out bus.**

Which is what mastering is (using effects on the stereo/main out bus). Many critical processes can only be done in mastering.

Here are couple of examples of why a song needs to be mastered:

- ◆ **Do you want to be able to play your song loud without it breaking up?** Then you need mastering. **In mastering**, you can compress the entire song as a whole (or in separate BANDS) so it doesn't peak too hot or distort during loud playback. Compressing a song in mastering also kind of meshes everything together. **In mixing**, you can only compress individual instruments like the bass, vocals, etc. This does nothing for loud playback nor does it mesh the song together as a whole.
- ◆ **Do you want your songs to be as loud as the songs on the radio?** Then you need mastering. **In mastering**, you can use a loudness maximizer and make your songs as loud as needed without distorting. **You can't do this in mixing** just by cranking up your levels. You will distort before reaching your desired loudness.

**This question is kind of like asking, "Why does my cake need to go in the oven?"** If you want it to be a real cake, and be similar to other cakes, the oven is the final process to get it there. You don't have a cake unless it goes in the oven! You only have raw mixed ingredients. The oven meshes everything together to be like other cakes.

## Can Anyone Become A Great Mastering Engineer?



**I would say “YES,” most people can become a great mastering engineer.** I say this because *most* of the mixes I receive from clients are pretty good and I know the audio engineer (the band member with a computer) has only minimal training. He could easily be great if he put a little more study and practice time into it. **And if he had this book to teach him what took me over 19 years to learn! Ha!**

**The bigger question is, how much time and effort are you going to put in?** You know, everyone *can* be in good physical shape, or at least in decent shape. The choice is yours.

But, is there going to be a diet and exercise plan that's followed daily for months, or is everything going on eBay or craigslist a couple weeks after starting? It's up to each individual to do what's necessary to achieve their end goal.

**You get out what you put in, even when it comes to audio mastering.**

This book gives you the knowledge and tools you need to become a great audio mastering engineer. And you'll learn a lot faster than I did. **But it's still up to you to read this book in its entirety and put in the practice time.**

## 8 Effects Processors Used In Mastering

This chapter covers the *main effects processors I use during audio mastering*. A few audio mastering engineers might use a couple more, some use less. I kept everything basic and straight forward, focusing on only the *main* settings all processors have.

If you don't know about the **FREE Volume Meter Software (ReplayGain)**, this tip alone is worth several times the price of this book!

### Standard 5-Band Equalizer

An equalizer (EQ) allows you to add, subtract or completely remove (hi and low pass filter) the volume level in a specified frequency range. The volume level of a song's bass, treble, brightness, etc. can all be altered using a 5-Band Equalizer.

**Important Note** - Throughout this book, I might refer to the **Standard 5-Band Equalizer** as "EQ, Standard EQ, or 5-Band EQ."

The **Mid-Side Equalizer** is very rarely used and is always called "Mid-Side Equalizer or Mid-Side EQ".

#### TYPES AND CONTROLS FOR THIS PROCESSOR:

**Types** - There are three types of EQs to choose from - **Parametric, Pass, Shelving** (I don't use this EQ in mastering).

In audio mastering, most of the time, the only type I use is **Parametric**, which is the standard setting we're all used to.

In rare instances when a song has HIGH-end hiss, I use the **Pass** setting (on the song's effects bus) and *low pass filter* around 20k. Then *boost* a few dbs at roughly 15k, to bring back some of the HIGH-end.

**5-Bands** - You have the option of turning on from 1 to 5 bands. You can then designate a frequency and Q amount for each band.

**Frequency** - 100hz, 500hz, 3k, 10k are all examples of frequencies. Most 5-Band EQs go from 20hz to 20k.

**Q** - This is the width of the EQ (your bandwidth). For example, if you set your band at 5k with a very *narrow* Q (16) any EQ boost or cut will affect *only* very close to 5k. A wider Q setting (like 3) any cut or boost affects an entire frequency *range* (4k to 6k).

**Gain** - This is used to make a frequency's volume lower or higher (boost or cut).

#### HOW TO USE THIS PROCESSOR:

1. *Select* a TYPE (Parametric, Pass, or Shelving).
2. *Pick* a BAND (or up to 5) and *select* your FREQUENCY.
3. *Set* your Q (your bandwidth).
4. Use GAIN to *boost* or *cut* the volume of the band's frequency.

---

## "Mid-Side" 5-Band Equalizer

The difference between a **Standard 5-Band Equalizer** and a "**Mid-Size**" 5-Band Equalizer is how they target the stereo field.

Whatever frequency band you create, a **Standard 5-Band Equalizer** works across the width of the *entire* stereo field.

A **Mid-Side 5-Band Equalizer** can be used to target only the *middle* of the stereo field (roughly between 70L to 70R) or the *outsides* of the stereo field (L to 71L and 71R to R).

**Everything else about this processor is covered in the previous section "Standard 5-Band Equalizer."**

---

## Multi-Band Compressor

An audio compressor is used for several different processes which includes compressing or limiting an audio signal.

More detailed information about compression in audio mastering is covered in the section "Compression Made Easy." This section contains everything you need to know about compression in audio mastering.

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## Multi-Band Spectral Enhancer (Harmonic Exciter)

All **Spectral Enhancers** have a different sound to them (depending on the manufacturer). They all achieve their sound by adding harmonics and phase correction (to some extent). This phase correction adds separation and clarity to the audio master. Some **Spectral Enhancers** do this better than others.

Harmonics allow the processor to add boominess, brightness, and warmth without adding much *volume*. For example, this means you can make your LOW-end *thicker* without making it much *louder*. An option you will need at some point.

The separation a **Spectral Enhancer** provides is quite an amazing effect.

**Only if the song isn't already too bright, I always try to *Spectral Enhance* the UPPER-MIDS at least 1 unit to take advantage of the separation it offers.**

Note - The brightness, separation, and clarity this processor creates can be achieved *only* in the UPPER MIDS or HIGH Band.

If you ***Spectral Enhance*** the LOWER-MIDS or LOW Band, it makes it *boomier, thicker, warmer not brighter or clearer*.

Also, you can only *add* effects with this processor. You cannot *cut* (remove) them.

### HOW TO USE THIS PROCESSOR:

1. *Select* your 4-Band Frequency Range (LOW, LOWER-MID, UPPER-MID, HIGH).
  2. Use GAIN to *add* Spectral Enhancing as needed.
- 

## Multi-Band Stereo Widener

The stereo widening effect simply increases the perceived stereo width of a **BAND**. This is done by first slightly changing its phase and character. Then delay is added to the left and right channels.

### HOW TO USE THIS PROCESSOR:

1. *Select* your 4-Band Frequency Range (LOW, LOWER-MID, UPPER-MID, HIGH).
2. *Select* the amount of DELAY (between the left and right channels).
3. Use GAIN to add Stereo Widening as needed.

Note - I ***always*** use this processor in the HIGH Band (if it's not too thick or harsh) . It gives the master a little extra stereo sparkle.

I ***never*** use it in any other **BAND**. Using this processor in the bass area is of course a no-no (no one wants stereo bass).

And if its over-used in the UPPER-MIDS, the middle of the mix strangely moves to the outside of the stereo spectrum. You ***DO NOT*** want your lead vocals and snare to be panned to the outsides of the song!

---

## Multi-Band Mastering Reverb

**The reverb effect is used to simulate space.** When reverb is applied to an audio track it will sound like it was recorded live in the space size you select on the processor. Common space size options include a small room, cathedral, large hall, etc.

### HOW TO USE THIS PROCESSOR:

1. *Select* your 4-Band Frequency Range (LOW, LOWER-MID, UPPER-MID, HIGH).
2. *Choose* your reverb TYPE.
3. Use WET/DRY to *add* Reverb as needed.

Note - I ***rarely, if ever, use this processor in audio mastering.*** If I do, it's a very slight amount (like 10-15% wet) in the *entire* 1k to 20k range. I adjust the HIGH Band (making it 1k to 20k), by sliding it to the left until I get to 1k.

You don't want to go much *lower* than 1k or you'll start reverbing bass content.

Also, you don't want to use a *narrow* range like 1k to 3k or it will sound tinny, flangy and fake.

# Loudness Maximizer

A Loudness Maximizer is a compressor, but its main function is to make a song mix as loud as possible without distorting.

## TYPES AND CONTROLS FOR THIS PROCESSOR:

All **Loudness Maximizers** have slightly different settings that use different names, but *THRESHOLD* is the main one.

**Threshold** - This is your volume control (the lower the threshold setting, the louder the volume of the song).

But you can't just set your threshold *anywhere* in an attempt to make your song the loudest song ever. It will distort.

**Margin/Out Ceiling** - This useless setting is on most **Loudness Maximizers** and has to be set at something. Most engineers (including myself) set it at -0.2db (that's two tenths of a db). Just set it and forget it.

**Character** (or it could be called something else on your processor) - **This setting deals with the attack of the processor** (though it is not the actual attack setting). No, this processor doesn't turn on and off since it's being used on a full song, but you could experience pumping or crackling if a song is very dynamic or you're trying to make it too loud. If this is the case, a higher (or lower depending on your unit) character setting makes the processor less aggressive and more transparent, which sometimes eliminates a pumping or crackling problem.

**Mode/Shaping** - This setting is similar to character. **It's a tonal shaping adjustment.** Trial and error is needed to determine what settings work best for your situation.

**Dither** - I set mine at 16bit and normal, with light character. It works well for me.

## HOW TO USE THIS PROCESSOR:

1. Set your CHARACTER, MODE/SHAPING, and MARGIN/OUT CEILING (-0.2db).
2. Set your THRESHOLD.

As I mentioned earlier, you can't just set your THRESHOLD anywhere.

You should have a peak level meter on the unit. You want to *set* your THRESHOLD a little *below* the top peak level of the audio material.



You can then use the **ReplayGain** software to see how loud the song master is and adjust from there.

---

## De-esser

**A de-esser is used to reduce bright sibilant sounds in vocals like "Sss, Shh, and Chh."** It can also reduce any shrill instruments that reside around the 5k-7k range.

How it works is when the "Sss" or shrill sound gets too loud, the de-esser automatically reduces it. This is achieved by reducing the volume level of the frequency range where the sibilance resides, once it passes a set threshold.

### HOW TO USE THIS PROCESSOR:

**When I use this processor its on the song's effects bus, *not* on the stereo/main out.** I use a very simple de-esser plug-in that comes with Cubase. It has an auto threshold function that works to perfection. If your de-esser has slightly different settings and you know anything about music processors, it's a no-brainer to figure them out.

1. Set THRESHOLD to *auto*.
2. Set GENDER as needed.
3. Set S-REDUCTION to around -7 (or as needed).

**Note - I repeat, I de-ess on the song's effects bus, NOT on the stereo/main out.** This way you're effecting the song by itself before other processors on the stereo/main out kick in. I guess you *could* put it on the stereo/main out, but the way I do it works for me. No reason to change.

---

# THE 18 LAWS OF AUDIO MASTERING

In this chapter, I will discuss what I'm calling the "Laws Of Audio Mastering." **Very simple concepts, but *very important* ones because most of them are used *every time* you master a song.**

**Read through these laws now, and then again when you're finished with this book.** Write them down and *learn* them all! If you want to be a great audio mastering engineer and skip a few of these laws during your mastering sessions - you won't be.

These laws will not only help you become a great audio mastering engineer, they'll show you how *not* to become a bad one. I guess you could also call this section "Mastering Mistakes To Avoid."

Here I cover a few of the Laws in this book.

## Know The Genre Of Music You're Working On

To be great at audio mastering, **you need to know the sonic qualities of the genre you are working on!**

Note - Later in this book I will break down the sonic qualities for each genre.

When I first started mastering professionally in 1999, I was good, but most of my experience was in EDM, pop rock, and hip hop. I knew the sonic qualities for *those* genres very well, and basically applied them to *everything* I mastered.

It worked until I started getting into heavy metal and hard rock songs, and gave them that pop / EDM / hip hop bass feel. The client's were like, "Dude, hard rock is about the guitars, man. You got the bass cranked up and I can't even hear the guitars!" Oops...

After that example, I think you get the idea here. **Know the sonic qualities of the genre you're working on!** A lot of sound engineers don't...

# Don't Do Counter Productive Processes

In this section I'm referring to two or more opposite processes that negate each other. This can easily happen when you're going back and forth with different processors that can do virtually the same thing.

## COUNTER PRODUCTIVE EXAMPLE

(In this example four processes are being applied)

1. **Multi-Band Compressor** - *Gain* +2db in UPPER-MIDS
2. **Spectral Enhancer** - *Gain* +2 units in UPPER-MIDS
3. **Standard 5-Band EQ** - *Cut* -2db in 1-6k Range
4. **Multi-Band Compressor** - Set THRESHOLD 60% (with a 5:1 ratio) on the UPPER-MIDS.

Two processes are basically EQ boosters going *up*, and two processes are EQ cutters going *down*. You're going in circles!

**You needlessly added four effects that are, for the most part, cross canceling each other out!**

This would kind of be like having a big empty glass and adding 2 cups of water, and then subtracting 2 cups of water. You're left with the same big empty glass you started with! You didn't have to do *anything* to get that result!

**If you always think "natural sound first," and do a good job determining exactly what sonic qualities the song mix lacks, you won't have this problem.** I talk more about this in the next law "Always Think Natural Sound First."

There are hundreds of scenarios where your effects processes could be counter productive. **As you practice and hone your craft, you will learn how to use *only* the processes you need.**

**Important Note** - You *can* use several different similar processes in the *same* direction. I **EQ** boost AND **Spectral Enhance** (if even slightly) on more than half the songs I work on.

**Its very common to use a few different effects processors in the *same* direction.**

# Always Finalize On Fresh Ears

I've learned a lot over the years. One thing I learned I cannot do...

**Listen to music for several hours and then perfectly master a song.** Most will call the problem burnout or ear fatigue. Whatever you call it, it *greatly* impairs my mastering skills.

After listening to music for several hours, one of two things happens to me.

**1. My ears get sensitive.** Bright sounds start to annoy me. So, I end up compensating and I master everything very dull. The masters aren't as bright and clear as they should be.

**2. My ears get numb.** The songs start sounding dull. They don't sound as bright as they really are. This time my over compensation is making the masters too bright. This is the same problem someone losing their hearing in the HIGH-end would experience.

For me it's usually #1, but that's irrelevant. I can't do final masters when my ears are in either state.

## MY SOLUTION?

**I always do two masters on each song, with an extended break in-between them.** After I do the initial masters on a 12 song CD, I will not listen to any music for at least 4-6 hours before I revisit the songs and do a final second master and tweak on them. Or, I'll do the second master and tweak on completely fresh ears the next day.

**Using this fresh ear approach, when I revisit the songs its like a lightbulb goes off in my head!** Any tiny sonic details that I'm slightly off on become 100% clear and I quickly adjust them.

Note - I want to clarify this. I don't listen to music for at least 4-6 hours before doing the second (final) masters. But, sometimes I might master 20 songs, take a 4-6 hour break, and then do the second master on all 20 songs. I don't want you to think I'm taking a 4-6 hour break after *every* song! It would take me a week to master a 12 song CD!

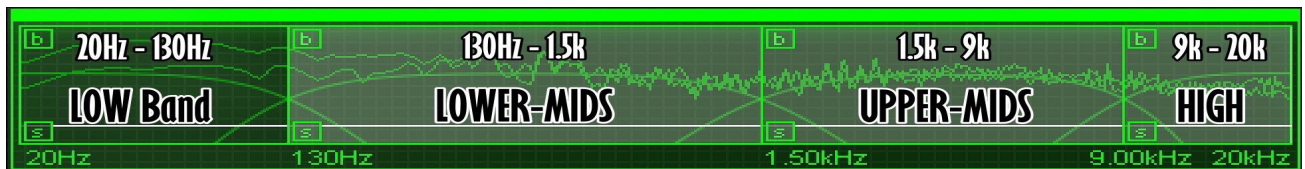
# The 4-Band Frequency Ranges In Multi-Band Processing

In this book, many times I've mentioned that audio mastering is an *overall* process. It affects a song *as a whole*. If you make a song louder, the *entire* song is made louder, you can't make *only* the lead vocal track louder. This is true.

But the concept "affects a song as a whole" technically isn't entirely true. I explained it that way to start because I didn't want any confusion between mixing and mastering.

The truth is, the 4-BAND frequency ranges used in audio mastering splits a song into four independent parts. This gives you a little more flexibility when making adjustments.

## THE 4-BAND FREQUENCY RANGES IN MULTI-BAND PROCESSING



Several of the processors used in audio mastering are multi-band processors, which work within the four frequency bands (LOW, LOWER-MID, UPPER-MID and HIGH). You have control over the frequency range each BAND covers, but there are basic settings for these BANDS that most people use (at least initially). I will go over the initial frequency range setting for each BAND in the upcoming pages.

These BANDS are the reason why audio mastering technically is not an overall process, since you can work independently with them. For example, with a multi-band compressor you can *slightly* compress *only* the LOW Band, but compress the UPPER-MIDS *very heavy*.

Using a "*single-band*" compressor, if you add heavy compression, the *entire song* is compressed heavy, *not* just a specific frequency BAND.

As you can see, multi-band processors give you more options and flexibility. Its like comparing a regular one-speed bike to a 10-speed bike. Even if you don't use all 10 gears, you still have them if you need them. The one speed bike, you're limited to one option.

**Important Note** - On the upcoming pages, I give you several tips but unless you SOLO each BAND it will be difficult to analyze them. During your A/B comparisons, be *sure* to SOLO each BAND on the song you're mastering *and* your reference track

## The Sonic Qualities In Audio Mastering

When you master a song, your goal is to match a well mastered commercial song. **During a mastering session you need to A/B compare each sonic quality one at a time.**

**After many years, I still mentally run through my entire sonic quality checklist.** This is a must!

For example, does the song have too much or not enough boominess, brightness, bass volume, etc.? If I don't do this, eventually I'll start missing sonic qualities to the point where my masters start sounding poor, and I'm no longer a great mastering engineer.

This section is an overview of the sonic qualities in audio mastering. **When you breakdown your reference track for A/B comparison, these are the sonic qualities you are trying to match.** I included a few notes for each one. Later in this section, I explain everything in greater detail.

### Clarity & Separation (Any BAND)

**Clarity and separation differs from brightness and tone, though many don't understand this.** I have a great non-music example that explains this.

Let's say your vision is poor and you wear glasses. You're watching TV with your glasses *off* and the picture is blurry. You can go up to the TV and make the picture brighter and use contrast to adjust the tone, but it will still look blurry to you, with objects blending together. Maybe a little clearer, but nothing drastic.

Once you put your glasses on, now you have clarity and separation between the objects on the screen. Brightness and contrast only brought a slight bit of clarity improvement. The glasses were the solution.

### Brightness & Tone, Sparkle (UPPER-MIDS & HIGH Band)

**This is the first step I take in the mastering process.** I want to initially get my brightness, tone, and sparkle somewhat close to industry standard, so I can work everything else around it.

This sonic quality also includes the opposites (dull, lifeless, flat, tinny).

## **Bass Volume, Boominess, Kick Punch (LOW Band or LOWER-MIDS)**

**Remember, I'm not saying to necessarily *add* boominess**, some genres like hard rock don't have much. I'm saying to check the bass volume, boominess, and kick punch so they're correct, matching your commercial reference song.

## **Warmth, Thickness, Presence (LOWER-MIDS or UPPER-MIDS)**

**ALL songs need *some* thickness and presence.** No genres are thin and tinny unless it's a ukulele solo. How much warmth you need depends on the genre. With classic rock your focus is on warmth. But with heavy metal or hip hop, not at all.

Unless of course you have the client, like I did, who wanted soft warm hip hop masters. Ha! But then again, he wanted a refund too after I did what he asked for. (I told this story very early in the book)

This sonic quality also includes the opposites (harshness, thinness, distortion, etc).

## **Compression, Dynamics (UPPER-MIDS, LOWER-MIDS, or Overall)**

You want proper compression and as much dynamic range as possible (after meeting your genre's overall volume level). **See the upcoming section "Compression Made Easy."**

## **De-essing (On song's effects bus)**

If the Ssss sound is too bright on the vocal tracks, usually you can de-ess the entire song a bit in the mastering process and not affect the instruments. But if it does affect them (dull them too much), request a remix with the vocals de-essed.

## **Stereo Width (HIGH Band and/or UPPER-MIDS)**

I always **Stereo Widen** the HIGH Band a bit, and use **Mid-Side EQ** (Side Only) in the UPPER-MIDS if I need to *boost* the stereo field. You can also add in a **Single Band Stereo Widener** (on the song's track bus) as another option.

## **Overall Volume (Overall)**

Use **ReplayGain** to check your song's overall loudness, and then use your **Loudness Maximizer** to get it where it needs to be.

## SOLUTIONS TO COMMON MASTERING PROBLEMS

In this section I will cover common sonic quality problems you will encounter in audio mastering and how to fix them. Problems like a song being too bright, harsh, tinny, not boomy enough, not loud enough, etc. In this PDF only a few pages are covered. The full ebook has many more graphs and images.

### Brightness, Tone, Sparkle (UPPER-MIDS & HIGH Band)

Brightness, tone, and sparkle are some of the most important sonic qualities in the audio mastering process. The vocals, lead guitar, synths, and music melody are often the main focal points of a song, which makes getting these elements correct very critical.

We all know what brightness and sparkle is. But the "tone" of the brightness is something a little different. I guess a similar comparison of tone would be the contrast control on a TV.

A good music example is the lead guitar in a rock song. When mastering a rock song, I have to use the right combination of **Spectral Enhancement** and **Standard 5-Band EQ** in the UPPER-MIDS, so the guitars have a nice tone (bite) to them. An **EQ boost** between 3k to 6k changes a guitar's tone.

Sometimes I might *boost* only 4k with a narrow Q to achieve the proper tone I'm looking for, or even the entire 4k to 6k range.

**Most of the time I employ a staggered range.** Example, *boost* +2db at 3k (narrow Q), and then +6db at 6k (medium Q). Whatever gives me the bright tonal bite I'm looking for. Its trial and error with the **Standard 5-Band EQ** and the **Spectral Enhancer** until I find it.

### DIAGNOSIS AND REMEDY

Some or *all* of the actions given might need to be taken to solve your sonic problem. Decide which processes to use, trial and error with them, and then a little tweaking of the settings will be necessary. **What I'm trying to say is, these aren't blind "set it and forget it" presets.**



## PROBLEM - NOT BRIGHT ENOUGH

You're going to either add brightness or remove mud (anything that conflicts with brightness). Sometimes you need to do both actions.

**Important Note** - Before applying any of these actions, when you first start out, make sure your **Multi-Band Compressor's** THRESHOLD and RATIO settings aren't cutting brightness in the UPPER-MIDS. You don't want to do counter productive processing. Remember, natural sound first.

Processor	Control	Action	Location	Notes
Spectral Enhancer	Gain	Boost	UPPER-MIDS	I always try to <i>add</i> at least one unit of spectral enhancing (if possible) to every song for the clarity and separation it brings. <i>Add</i> more if needed for brightness.
Standard 5-Band Equalizer	Gain	Boost	3k to 6k	Move around this range or use the entire range to achieve your desired brightness and proper tone. <i>Boost</i> as needed.  Note - Many times I employ a staggered range. Example, <i>boost</i> +2db at 3k and +5db at 6k. This might give me the nice bright tone I'm looking for
Standard 5-Band Equalizer	Gain	Boost	4k-10k Range	This is rare, but every once in a while I'll get a song that's total mud, with a very weak HIGH-end. After <i>cutting</i> the bass a bit, I administer a huge +8-10db boost in the entire 4k-10k range. The results can be miraculously

				<p>positive.</p> <p>Note - This is also an example of how sometimes huge unconventional actions are required to get a great mastering result from a poor mix.</p>
Standard 5-Band Equalizer	Gain	Cut	150hz to 500hz	<p>This is a rarely needed action, but if the bass guitar/synth is very loud and running over everything, you might need to pinpoint it with EQ and <i>cut</i> it a bit.</p>
Multi-Band Compressor (GAIN)	Gain	Cut	LOWER-MIDS	<p>Sometimes a 1-2db <i>cut</i> in this range will make a song brighter, especially if this BAND is distorted or has no separation. It's addition by subtraction. Subtracting blurry mud leaves brightness.</p>
Multi-Band Compressor (GAIN)	Gain	Cut	LOW Band	<p>If a song mix has super loud bass, <i>reducing</i> this BAND a couple dbs will help reduce mud and make it clearer.</p> <p>This range is far from the UPPER-MIDS. So, the bass would have to be very loud to effect them.</p>

# COMPRESSION MADE EASY

Since compression is such a big part of audio mastering it has its own separate section.

**Add a little bass or treble, even a child knows the basics of EQ.** But when it comes to compression, many audio engineers who own a recording studio, or work in one for a living, don't understand it very well. I know this by the number of re-master jobs I receive from studios all around the world that don't apply *any* compression at all!

**After reading this section, you'll know everything you need to about compression in audio mastering.**

## Which Compressors Are Used In Audio Mastering?

Before I get into what compressors can do in audio mastering, I have to mention which two I use.

**1. Loudness Maximizer** - Is used to raise the overall volume level of a song to industry standard level, without distorting.

**2. A Multi-Band Compressor** - Has several functions that I explain in the next section.

**Important Note** - From here on out in this book, when I mention COMPRESSION I am referring to actual compressing, limiting, squeezing an audio track.

If I mention GAIN, I'm referring to a volume level increase using the **Multi-Band Compressor**. YES, in addition to compressing, you can increase or reduce the volume level of a BAND with a **Multi-Band Compressor**.

## What Can Compressors Do In Audio Mastering?

A lot of sound engineers think all compressors are used for is limiting / squeezing / compressing an audio signal (which you could also call reducing volume spikes). Yes, a compressor can do this, but there are a few other reasons why a compressor is used.

# AUDIO MASTERING STEP-BY-STEP

**You FINALLY made it to the "Audio Mastering Step-By-Step" section!**



**This section covers my audio mastering session, step-by-step.** I use the techniques I've outlined in earlier sections of this book, and explain the logic behind my actions.

**This PDF only shows the opening steps. The 192 page ebook includes everything explained in easy step-by-step detail.**

If you haven't read anything else in this book, this section might not be of great help to you because I only give vague instructions. For example, I might say, "check the UPPER-MIDS, compress them properly, and then make sure brightness and clarity are correct."

Now you might ask, "Where are the UPPER-MIDS? How do you compress them properly? What compression threshold and ratio do you use? How do you know when brightness and clarity are correct? How do you adjust brightness and clarity? How do you know when the BAND is correct?"

**These questions, and hundreds more, are answered in previous sections of this book.**

## Initial Mastering Template Setup

In this section I'm going to start off with the initial mastering template I use. I start many of the processors either OFF or Neutral. But regardless, this is the initial mastering template I start out with.

**A lot of people are looking for the "magic mastering presets."** Just open the magic preset template and your entire CD is mastered in an hour. Well, magic mastering presets are to audio, what six-minute abs, the thigh master, and the ab roller are to weight loss. It doesn't exist! Especially if you use my template. Most of the processors are off until I evaluate the mix.

Now, I can say roughly 25% of the songs I work on greatly benefit from my preset template "as is." This is why auto mastering programs like LANDR can improve *some* songs. This is also the saying, "even a broken watch is right twice a day."

But, many of the songs I work on need a lot of work. The preset template settings are drastically changed.

My initial mastering template is just that. An initial starting point. You have to start somewhere.

## **Let's Start The Audio Mastering Session**

### **1. It's Time To Get Started!**

Along with these step-by-step instructions, use what you've already learned in this book, good A/B comparison, and a solid work ethic to create great audio masters!

### **2. What File Types Are Used In Audio Mastering?**

This has to be mentioned first.

**File Types Used In Audio Mastering** - .WAV or .AIFF (a single stereo interleaved file).

You *can* master an MP3 but that's like working with 720 STANDARD video instead of 1080 HD video.

**Sample Rate And Bit Depth** - 44.1kHz and (16 or 24 bits) is adequate.

A CD is 44.1kHz and 16 bits. MP3 is the new industry standard and is at a far lower sample rate than 44.1kHz.

There's really no reason to master a file any higher than 44.1kHz, since it's eventually going to get converted down for the consumer. Unless of course the client demands it, which happens about 1% of the time for me.

**Note - Now, there is mastering for iTunes which requires a huge 96khz file. If you're mastering for this format, obviously you will need to work at a 96khz sample rate.**

### 3. Import Files

**A. First off, open the INITIAL TEMPLATE we created.**

**B. Set your file TYPE (.Wav, .Aiff, etc.), and *remove* BPM TEMPO CODE** (if your DAW software allows it).

**C. Import the SONG MIX FILE and convert it to 44.1khz / 16 bit.**

The reason I always convert all files is because sometimes a client uses a couple different sample rates for their CD, or they send me remixes in a different sample rate. If I convert everything to 44.1khz / 16 bit right off the bat, it makes mastering life a bit easier.

**D. I always insert (start) the song file to 0:05 (instead of 0:00).** This is so I have room to set the front locator at 0.25-0.5 seconds *before* the start of the song file.

**E. Cut the front of the file about 0.25 seconds before the song starts.** There's usually silence there.

Even if you don't see anything, be sure to listen from the very beginning of the file before cutting. Sometimes a song fades in slowly and the audio content is not visible.

**Note - 0.5 second TOTAL silent time is the absolute minimum.** Sometimes if you go under 0.5 seconds, eventually when you make a CD, the first note of the song will be cut off. You might not even notice it until a client makes a CD on their own, gets it duplicated, and then notifies you about a few songs being cutoff. **Which is a disaster! It's not worth taking the risk.**

**F. Import your A/B comparison industry standard reference track.**

Make sure it's the same genre with comparable instrumentation. Don't use a reference track with 6 vocal/instrument tracks if the song you're mastering has 30!

## 4. Visually Evaluate The Song Mix File

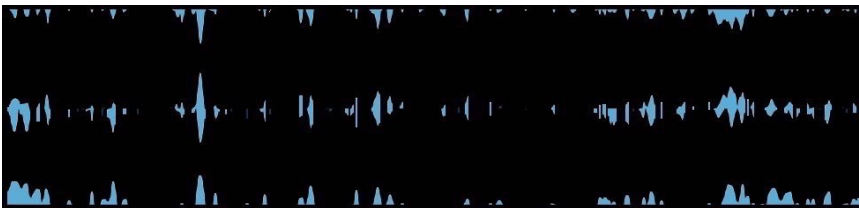
**A. The next step is to visually evaluate the song mix.** This might tell you a few things about how to tackle the project. In this section I will show a few typical file types.



**GOOD** – This file is good (provided it wasn't recorded distorted). It has +6db of headroom in the verses and +3db in the choruses. A lot of headroom to do whatever you need to. This is considered by *most* the perfect amount of headroom.



**VERY LOW** - This song's overall levels are very low (roughly +12db of headroom). In this scenario, I just gain the entire song up +12db and master it. This will not negatively affect audio quality. It's not worth me sending it back to the client for a louder remix.



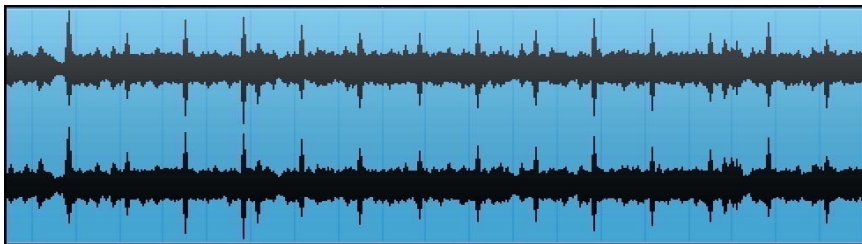
**DISTORTED** - This file is over-level and more than likely distorted, with no dynamic range. There's an 80% chance you won't be able to master it, and the client will need to reduce their levels and upload a new mix.

Once in a while (20% of the time) I see a hip-hop song that looks just like this and it's *not* distorted. It barely makes it. This is why *listening* is a must before rejecting a song mix.



**DISTORTED AND GAINED DOWN** - This file is the exact same file as the "distorted" one above, but it's gained down -3db. I get this once in a while.

During mixing, the song track levels were originally over 0 level and distorted. The client gained the .wav file down (or lowered the master fader) to achieve +6db of headroom. It doesn't work that way. All they did was make a distorted song lower in overall volume. It's still distorted and the mastering results will be poor.



**MONO** - Yes, there is a left and right channel (which technically means stereo), but notice how the top and bottom waves are 100% *identical*. This means mono. This is one time where *seeing* is better than *hearing*.

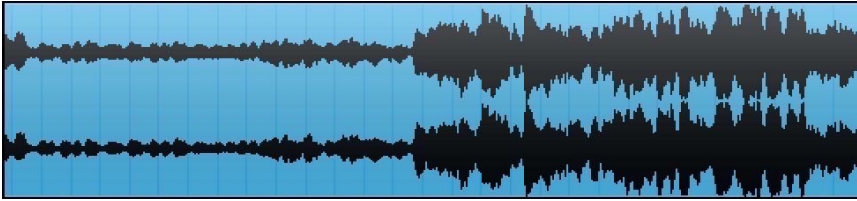
Roughly 15% of the mixes I get (especially hip hop) look close to this, because the mixer pans most of the instruments centrally, then uses stereo reverb thinking it will make the song stereo. That doesn't work.

To check for true stereo, use a **Mid-Side EQ** and *so/o* the sides. If you did this with the song in the photo above, all you would hear is very light reverb on the outsides of the stereo spectrum.

Unfortunately, a remix request isn't worth it. Most sound engineers that do this to begin with don't have the mixing skills to fix the problem. Especially in hip hop where many times the problem lies in a weak arrangement. You can't get a good stereo mix when all you have is a lead vocal, kick, snare and hi hat. There isn't much to pan to the outsides!

Note - Someone pointed out to me that most of the .wav files on this page look MONO. I agree, they are. The difference is, this one is pretty much 90% MONO. The other .wav files on this page are more like 70%. Still not good....





**TOO MUCH DYNAMIC RANGE (ERRATIC) BETWEEN SECTIONS** - The problem with this song is the chorus is +10db louder than the verses. There's way too much dynamic range here and the volume of your verses will always be too low (even after Loudness Maximization).

The solution is to highlight the verses and gain them all up about +5db. It works every time! And no, I wouldn't send it back to the client for a remix when I can fix it myself in a minute.

I cover this in detail in the section, "How To Handle A Song That Has Erratic Sonic Qualities."



**ENTIRE SONG COMPRESSED** - This song is compressed from beginning to end. I'm not saying this is necessarily a bad thing. My point is, you won't have to compress this song very much during mastering, if any. A lot of rock songs look like this.

**MASTERING FOR CLIENTS TIP** - Anything you can fix with editing or in audio mastering, fix it. Don't request a remix unless absolutely necessary. You might lose a client when they can't make the adjustments.

**B. NOW I TAKE ACTION** - If there's anything mentioned above that needs to be addressed, I address it now. Like gaining the entire song or certain sections, or a must needed remix request, etc.

## MASTERING DIFFERENT GENRES

In this chapter I will discuss the specific sonic qualities of over a dozen different genres.

### How Do I Know The Sonic Qualities For Each Genre?

This might be a dumb question, but I want you to know it's not *only* from years of experience and A/B comparison using industry standard songs. Customer feedback has also played a big part in writing these sonic quality pages, and this entire book.

### LEARNING SONIC QUALITIES YOURSELF

I had to come back and add more to this section because I felt I minimized the value of song study. Along with reading this book, you need to study the sonic characteristics of the genres you will be working on.

**I began my in-depth song study back in the mid 90's.** I was arranging and creating music at the time. Learning the instrumentation used in my genre was a must. I also needed to learn general rhythm patterns for each instrument and what function each one played in the arrangement.

**Mixing had its own set of learning challenges.** I had to learn instrument and vocal volume levels (in relation to each other), stereo field panning, what effects were being used on each audio element, and overall balance. This all needed to be studied and was learned by breaking down commercial songs on the radio, reading books, videos, etc.

**And last, there was audio mastering. Which is mostly about fine tuning a song's overall sonic qualities.** Hey, that's a new definition for audio mastering.

**If you want to be great at audio mastering, you can't just A/B compare everything you work on your entire life.** You need to closely listen to commercial songs in every genre, listening from a "sonic qualities" viewpoint. Learn each genre's brightness level, bass volume, boominess, compression/dynamic level, etc.

**IMPORTANT - Be sure to SOLO EACH BAND as part of your study.** How should the UPPER-MIDS sound in a good commercial song? How should the LOWER-MIDS sound in a good commercial song? One thing you'll notice during this exercise is how the LOW Band in commercial songs sound clear. You can hear the bass/synth and kick as two separate instruments.

When I SOLO the LOW Band of a client's song, most of the time its undefined and muffled, why is this? Because most clients poorly high and low pass filter their mixes, which means there's a lot of instrumentation bleed. The bass guitar bleeds into the kick and low part of the vocals, creating a LOW Band muffle.

## Vocals And Instrumentation May Change Your Sonic Approach

**Each main genre of music has its own specific sonic qualities.** But you also have sub-genres whose sonic qualities slightly vary from the main genre.

**What I'm trying to say here is the sonic qualities I give you for each main genre could vary.**

## How To Master Different Genres

Here's my mastering approach based on the clients I've worked with since 1999. Instead of just giving you a basic synopsis of the song genre, I felt detailing the main sonic qualities would keep everything more organized.

This section not only gives you my mastering approach for the genre, I also factor in client feedback so your masters will make them happy too. **But remember, A/B comparison and matching is always your goal.** This section assists you in doing that.

### CLARITY & SEPARATION (FOR ALL GENRES)

Regardless of the genre, each instrument and vocal should have its own space, allowing you to clearly hear everything. You should be able to understand at least 90% of the vocals (if not 100%). Unfortunately, if a mix is very crowded, little can be done in mastering to correct it (though I do encourage *trying* to fix the problem).

**NOTE – In this PDF I cover ONE genre. The 192 page ebook covers rock, hip hop, rap, classic rock, hard rock, edm, rb, and more.**

## How To Master Movie Soundtrack, Classical, And Jazz

**Ratings** - I rate each sonic quality on a scale from 1-10 (5 is an average amount). Except for overall loudness, I use my ReplayGain recommended levels.

**Clarity (6)** Each genre could vary, but overall they all have that "big warm sound" in common.

**Brightness (6)** This genre has a slightly above average amount of brightness, mainly because the instrumentation could include violins, bright trumpets, chimes, etc. You definitely don't want your master to be too bright and digital sounding, losing its warmth.

Most clients from this genre aren't very good at high and low pass filtering their instruments. They basically mix all their instruments raw "as is" which leaves the entire mix thick, and the UPPER-MID instruments peaking too brightly.

I've found *cutting EQ* around 2-3k will usually soften and cure this bright peaking problem.

**Bass Volume & Boominess (6)** I put this sonic quality at slightly above average because it pretty much depends on the song.

If there are big booming kettle drums throughout most of the song, or maybe there's a big bass jazz solo, you might be looking at 7-8 for bass and boominess.

All the genre's in this section need warmth, and extra bass helps with that. So, you definitely don't want the bass to be below average.

**Overall Compression (4)** Here's where a bit of controversy comes in. Myself personally, I cut the top off with a high THRESHOLD in the UPPER-MIDS. This is what's done with commercial songs and this is the correct way to do it. But you'll find a lot of clients want no compression in these genres.

My previous article "Vocals And Instrumentation May Change Your Sonic Approach" talks more about this situation.

**Stereo Width (8)** These genres typically have the most instrumentation that fills the entire stereo field. They need to be wide, especially the epic movie soundtracks. I've personally never heard a *narrow* movie sound track, jazz or classical piece.

**Overall Loudness ReplayGain Number (97)** This genre is one of the lowest in terms of volume. Sparing usage of the loudness maximizer will make the master warmer and more dynamic.

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## RECENT CLIENT TESTIMONIAL

***> I got a pleasant Twitter message (in July 2022) from Madraus an audio engineer from Lebanon, who's just starting out.***

Hello Mr. John. Thank you for the best 2 books I have read in my mixing & mastering journey. **Audio Mastering secrets and Song Mixing Secrets.**

I can't tell you how complete and smart I felt after finishing these 2 books and proud of myself. I live in Lebanon and I couldn't find the books so I asked my friend from Germany to ship them with him to me so I can read them (after months of searching for them locally).

**You have helped many of us upcoming engineers (I am 24 years old) and I'm sure the audio engineer world is grateful to have you. Thank you sir!**

***> I asked Madraus why he felt these books were so good? Here's what he replied.***

Thank you so much sir! I will gladly tell you why haha!

I've read around 10+ audio engineering books, and they were very efficient, and helpful.

**And this is how your books stand out from those books:**

For someone to be a "professional" in any domain, it doesn't simply suffice to be "good" or "skilled" at what they're doing. A person is Pro at what they're doing when, and only when, they know how to Fix mistakes when out of the box mistakes happen, common and uncommon.

Your books are not a catalog or a user manual for mixing and mastering. **They are a detailed guide to how to FIX issues that happen , whether they are popular issues, or not so popular.**

Not to mention how comfortable they are to read, and how easily delivered.

Very rich educational info, easily explained.

(Some authors think the more complicated and complex their book is, the higher chance for it to hit the top lists)

All sites I looked for : top mixing and mastering books, your books were on every one of them. - Madraus

***> Madraus, I purposely make every one of my books as easy to understand as possible. I'm very happy they helped you with your music. Thank you much for the kind words, they are greatly appreciated!***

***> My goal is to help any audio engineer who wants to quickly learn what I have over the past 20 years. I wish you the very best, my friend!***

Madraus jumped through hoops to get this book in Lebanon, 6,600 miles away. **You can order it now in 5 minutes and get it in a few days.**

**Now let's learn how to master audio like a pro, the easy way!**