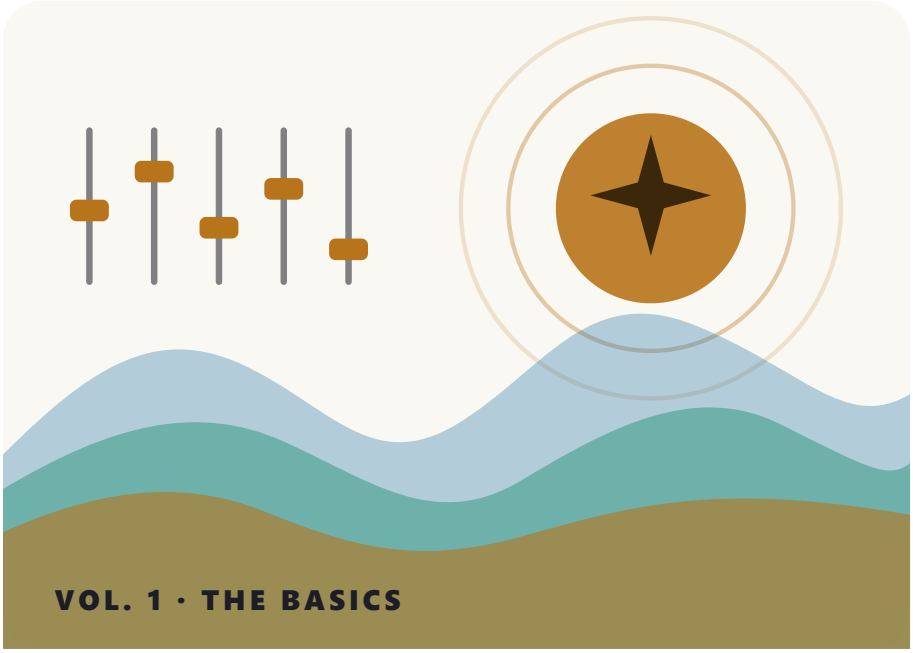


THE TRACKGLEAM HANDBOOK

Mixing & mastering for beginners

15 short chapters. Plain words, starting numbers, and a cheat box at the end of every chapter.

By DJ H3MP, producer and founder of TrackGleam · November 4, 2026

trackgleam.com/learn/mixing-and-mastering-for-beginners

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The numbers in this book are starting points, not rules. Every song is different, so trust your ears. All the numbers on one page:

trackgleam.com/tools/mixing-mastering-cheat-sheet/

Before you start: your room, monitors and headphones

Good mixes start before the first fader moves. Where you listen, how loud you listen and how clean your takes are decide more than any plugin.

None of this costs money. It is mostly habits, and they pay off on every song you make.

RULES OF THUMB

1. Mix at a moderate level, a little louder than a normal conversation. Turn it up only for short checks.
2. Check on more than one system: headphones, a car, a phone speaker.
3. Take a short break every hour. Tired ears hear less treble, so you start adding too much.
4. Pick 2 or 3 released songs in your style before you touch a fader.
5. Record clean takes at 24-bit, with no clipping. Fixing it later usually costs more.
6. Sit so your head and the two speakers make an equal triangle, with the tweeters at ear height.

WHY ONE STEADY VOLUME HELPS

Our ears hear less bass and treble when it is quiet, and more when it is loud. Mix very loud and the low end feels huge, so you turn it down too far. Pick one moderate level and keep it there, and your balance stays honest.

YOUR ROOM COUNTS

Bare walls bounce sound back at you and smear the low end. A rug, a couch, curtains and a full bookshelf already help a lot. Keep the speakers out of the corners, and if your room fights you, double-check the low end on good headphones.

MONITORS OR HEADPHONES?

Both work. Speakers let you hear the mix in a room, the way most people play music, but the room colors the low end. Headphones skip the room and show small details, yet they make the stereo image feel wider than it is. Mix on the one you know best, then check on the other.

CHEAT BOX

STARTING POINTS

Listening level	**About 70–80 dB SPL (a little louder than conversation)**
Breaks	**About 10 minutes every hour**
References	**2–3 songs in your genre**
Recording format	**24-bit WAV, 44.1 or 48 kHz**
Speakers	**An equal triangle, tweeters at ear height**

> **TRY IT** Play your favorite song on your speakers, your headphones and your phone. Notice what changes. That is what your mix has to survive.

FREE TOOLS FOR THIS

Audio File Analyzer

All the numbers on one page: Before you mix: quick setup checklist

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CHAPTER 2 · BASICS

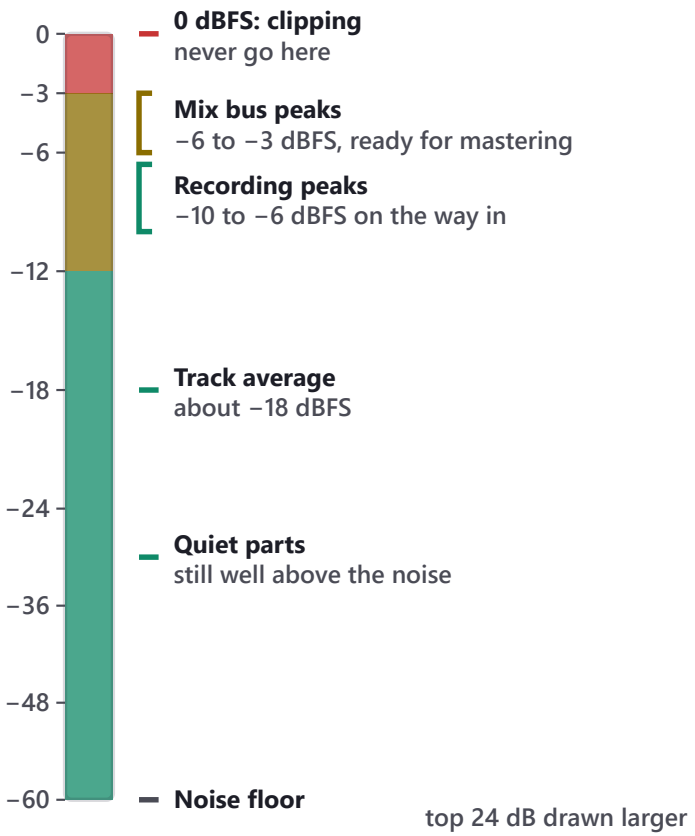
Gain staging, explained

Gain staging just means setting the level going into each step of your mix. Get it right at the start and everything after gets easier.

It is the least exciting chapter and the one that fixes the most mixes.

START WITH A STATIC MIX

Before you reach for a plugin, pull every fader down. Bring the tracks up one at a time, starting with the most important one, until the song plays balanced on faders alone. Most mix problems are level problems, and this rough balance shows you which ones are left.



A healthy level map. Every number in dBFS, from clipping down to the noise.

RULES OF THUMB

1. Record with peaks around −10 to −6 dBFS. At 24-bit there is plenty of room below that, so you never need to record hot.
2. Trim each track so it averages about −18 dBFS. Many plugins are built to sound their best around there.
3. Fix input levels with clip gain or a trim plugin, not the fader.
4. Start with the faders near 0 and balance with small moves.
5. Leave the mix bus peaking around −6 to −3 dBFS. That headroom is what mastering works with.
6. When a plugin makes things louder, match its output level before you judge it. Louder almost always sounds better at first.

WHY ABOUT −18 DBFS?

Many plugins that copy analog gear expect a level near −18 dBFS. It is a common calibration: 0 VU ≈ −18 dBFS. Hit them much harder and some start to distort or squash more than you asked for.

It is a guide, not a law. If a track sounds right a few dB hotter or quieter, leave it.

CHEAT BOX

STARTING POINTS

Recording peaks	**−10 to −6 dBFS**
Track average	**About −18 dBFS (RMS)**
Mix bus peaks	**−6 to −3 dBFS**
Bit depth	**24-bit (or 32-bit float)**
Never	**0 dBFS on the mix bus (clipping)**

TRY IT Pull every fader down. Bring the kick or the vocal up to about −18 dBFS average, then build the rest of the mix around it.

FREE TOOLS FOR THIS

True-Peak & Clipping Detector

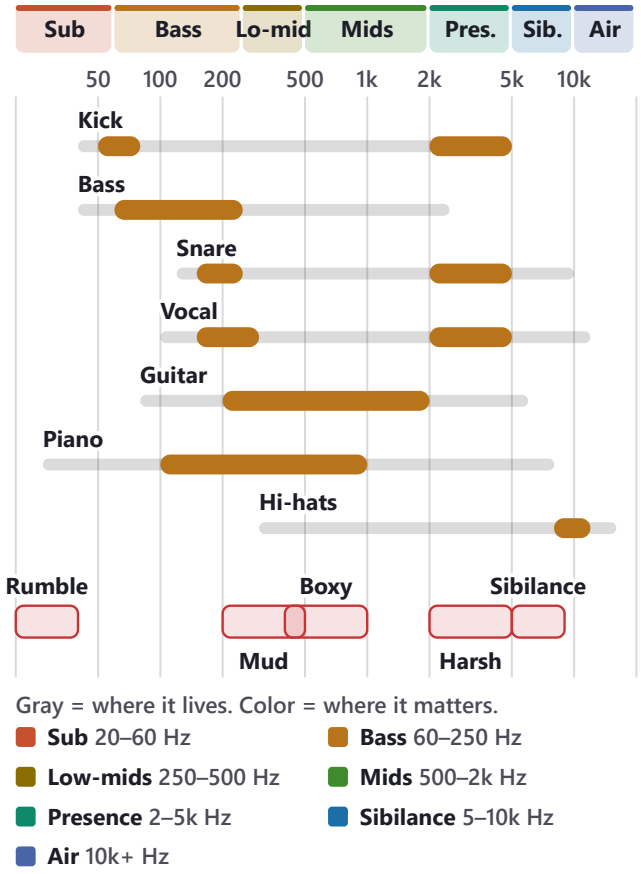
All the numbers on one page: Gain staging cheat sheet

CHAPTER 3 · TONE

How to EQ a mix

EQ turns frequency ranges up or down. On a beginner mix, most of the win comes from cutting, not boosting.

Think of it as making room. Every instrument gets a spot where it is the star, and gives up the spots where it is only in the way.



Where instruments live. Gray is the full range, color is where each one matters most.

RULES OF THUMB

1. Cut before you boost. Narrow cuts, wide boosts.
2. High-pass anything that does not need deep lows: vocals, guitars, keys, overheads. Start around 80–100 Hz and listen.
3. Mud lives at 200–500 Hz. A small cut there clears up most crowded mixes.
4. Harshness sits around 2–5 kHz. Sibilance (spitty S sounds) sits around 5–9 kHz.
5. EQ in the mix, not in solo. A sound that seems thin alone can be perfect in context.
6. Small moves go far. 2–3 dB is a lot. If you need 10 dB, fix the sound at the source.

WHERE TO EQ, INSTRUMENT BY INSTRUMENT

INSTRUMENT	WEIGHT	OFTEN CUT	BITE & AIR
Kick	50–80 Hz	300–500 Hz (boxy)	2–5 kHz (click)
Bass	60–120 Hz	200–300 Hz (mud)	700 Hz–1.5 kHz (growl)
Snare	150–250 Hz	400–800 Hz (ring)	2–5 kHz (crack)
Lead vocal	150–300 Hz	Below 80–100 Hz, 200–400 Hz (mud)	2–5 kHz, 10–12 kHz (air)
Acoustic guitar	100–250 Hz	200–400 Hz (mud)	2–5 kHz, 10 kHz+ (sparkle)
Electric guitar	100–250 Hz	Below 80–100 Hz, 200–500 Hz	2–4 kHz (bite)
Piano	80–200 Hz	200–500 Hz (mud)	2–5 kHz (attack)
Hi-hats & cymbals	—	Below 300–500 Hz	8–12 kHz (shimmer)

Starting points. Every recording is different, so sweep and listen.

PROBLEM FREQUENCIES

PROBLEM	WHERE	TRY
Rumble	20–40 Hz	High-pass it
Mud	200–500 Hz	Cut 2–4 dB
Boxy	400 Hz–1 kHz	Narrow cut
Honky, nasal	800 Hz–1.5 kHz	Narrow cut
Harsh	2–5 kHz	Small cut
Sibilance	5–9 kHz	De-esser
Hiss, fizz	10 kHz+	Gentle shelf down

CUT OR BOOST?

Cutting removes something that is in the way, so the rest can speak. Boosting adds level, and level is easy to mistake for better. Try a cut first. If the sound still needs more, a gentle, wide boost usually sounds more natural than a sharp one.

WATCH THE HIGH-PASS

A high-pass filter cleans up a lot, but too high and a voice or a guitar goes thin. Raise it until you hear the sound change, then back it off a little.

CHEAT BOX

STARTING POINTS

High-pass vocals	**80–100 Hz**
Mud cut	**250–400 Hz, −2 to −4 dB**
Presence boost	**2–5 kHz, +1 to +3 dB**
Air shelf	**10–12 kHz, +1 to +2 dB**
Q (width)	**Cuts 2–4, boosts 0.7–1**

> **TRY IT** On a muddy track, sweep a narrow boost slowly through 200–500 Hz. Where it sounds worst, turn that boost into a 3 dB cut.

FREE TOOLS FOR THIS

Spectrum Analyzer Reference Tonal-Balance

All the numbers on one page: EQ cheat sheet: frequency chart by instrument

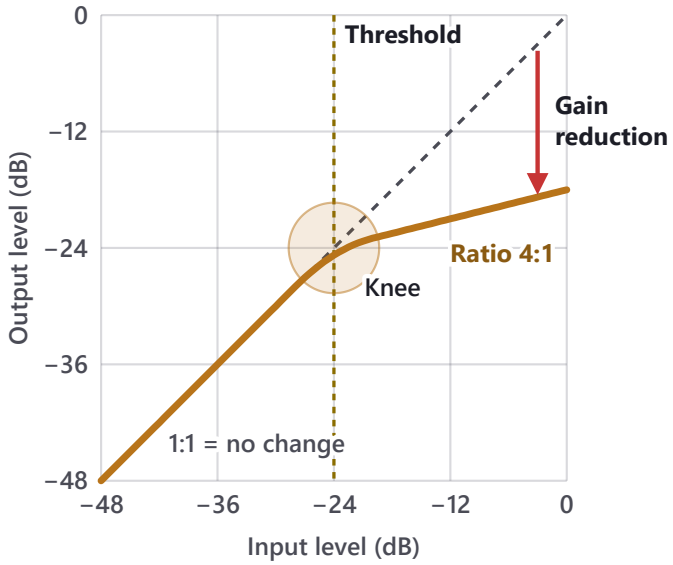
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CHAPTER 4 · DYNAMICS

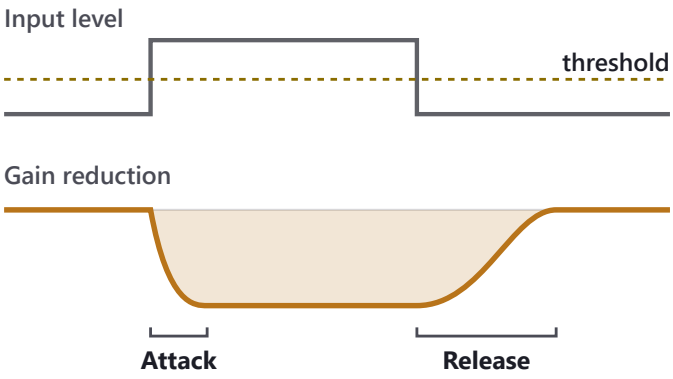
How to use compression

A compressor turns a sound down when it gets louder than the threshold. Use it first to control a part, then to shape how it hits.

Six controls do all the work. Once you know what each one does, every compressor makes sense.



How a compressor reacts. Above the threshold, a 4:1 ratio lets 1 dB out for every 4 dB in.



Attack and release. Attack is how fast it grabs. Release is how fast it lets go.

RULES OF THUMB

1. Threshold: where turning down starts. Lower it until the meter shows a few dB of gain reduction.
2. Ratio: how hard it turns down. 2:1 is gentle, 4:1 is firm, 10:1 and up acts like a limiter.
3. Attack: a slower attack (10–30 ms) lets the punch through. A fast attack (under 5 ms) tames it.
4. Release: set it so the meter recovers before the next hit. Let it breathe with the tempo.
5. Knee: a soft knee eases in, a hard knee clamps right at the threshold.
6. Makeup gain: bring the level back up, so bypass is a fair comparison.

COMPRESSION STARTING POINTS

SOURCE	RATIO	REDUCTION	ATTACK	RELEASE
Lead vocal	3:1–4:1	3–6 dB	5–15 ms	50–100 ms
Bass	4:1	3–6 dB	10–30 ms	50–100 ms
Kick	4:1	3–5 dB	10–30 ms	50–100 ms
Snare	3:1–4:1	3–5 dB	5–20 ms	50–100 ms
Acoustic guitar	2:1–3:1	2–4 dB	10–20 ms	About 100 ms
Drum bus	2:1–4:1	2–3 dB	10–30 ms	Timed to the groove
Mix bus	1.5:1–2:1	1–2 dB	About 30 ms	Auto

Starting points. Trust your ears.

PARALLEL COMPRESSION

Send a copy of the drums to a second channel and squash it hard. Blend it in under the untouched drums. You keep the punch of the original and add body and weight. It works on vocals and bass too.

HOW MUCH IS TOO MUCH?

If the sound gets smaller, duller or starts to pump when you did not ask it to, back off. A compressor that is working well is often hard to hear until you bypass it.

CHEAT BOX

STARTING POINTS

Gentle	**2:1, 1–3 dB of reduction**
Firm	**4:1, 3–6 dB of reduction**
Punchy attack	**10–30 ms**
Fast attack	**Under 5 ms**
Release	**50–100 ms, or timed to the groove**

TRY IT Set 4:1, pull the threshold down until the loudest words show 3–6 dB of reduction, match the output level, then bypass it to hear what it really does.

FREE TOOLS FOR THIS

Dynamic Range Meter

All the numbers on one page: Compression settings cheat sheet

How to use reverb and delay

Reverb puts a sound in a room. Delay repeats it. Together they give a mix depth, so some sounds feel close and others far away.

The trick is using less than you think. A little space makes a mix feel bigger; too much makes it blurry.

RULES OF THUMB

1. Put reverb and delay on a send (aux), so many tracks share one space. Inserts are for one-off effects.
2. Room for tight and natural, plate for vocals and snare, hall for big and slow.
3. Add 20–60 ms of pre-delay, so the vocal stays up front before the tail starts.
4. Time delays to the song: a quarter note is 60000 / BPM milliseconds.
5. High-pass the reverb return around 200–300 Hz to keep it from muddying the low end.

REVERB TYPES

TYPE	DECAY	SOUNDS LIKE	GREAT ON
Room	0.3–1 s	Tight and natural	Drums, guitars, a dry vocal
Plate	1–2.5 s	Smooth and bright	Vocals, snare
Hall	1.5–3 s+	Big and slow	Ballads, strings, pads

DELAY TIMES AT YOUR TEMPO

AT 120 BPM

1000 ms	500 ms	375 ms	250 ms	167 ms	125 ms
1/2 note	1/4 note	Dotted 1/8	1/8 note	1/8 triplet	1/16 note

A quarter note is 60000 / BPM milliseconds. Halve it for an eighth. A dotted eighth is three quarters of a quarter note.

SEND OR INSERT?

An insert puts the effect right on the track, so all of the sound goes through it. A send taps off a copy to a shared effect channel, and you choose how much of each track goes there. Sends save CPU and glue a mix into one space.

On a send, set the reverb plugin itself to 100% wet. You control the amount with the send level.

CHEAT BOX

STARTING POINTS

Quarter note	**60000 / BPM ms (500 ms at 120 BPM)**
Pre-delay	**20–60 ms**
Vocal plate	**1.2–2 s decay**
Reverb return	**High-pass 200–300 Hz**
Slapback	**80–120 ms, one repeat**

> **TRY IT** Turn the reverb send up until you clearly hear it, then back it off until you just miss it when it is muted.

FREE TOOLS FOR THIS

BPM Finder

All the numbers on one page: Reverb settings & delay time calculator

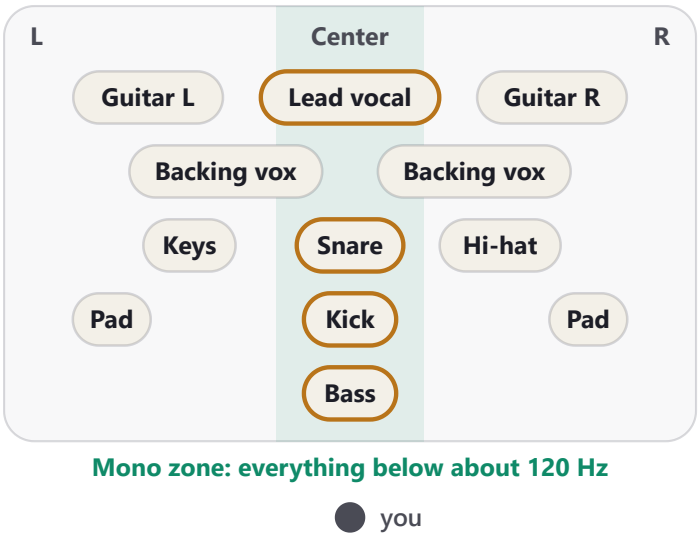
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CHAPTER 6 · SPACE

How to pan and set stereo width

Panning places each sound somewhere between your left and right speakers. It is the cheapest way to make room in a crowded mix.

Width is great, but your song also has to work in mono: on a phone speaker, a club system or a smart speaker.



The stereo stage, seen from above. Keep the low end and the lead in the middle.

RULES OF THUMB

1. Kick, snare, bass and lead vocal stay in the center.
2. Pan doubled guitars and backing vocals in pairs, one left, one right.
3. Check in mono often. If something disappears, it is too wide or out of phase.
4. Keep everything below about 100–120 Hz centered.
5. Use stereo widener plugins lightly. They can make parts vanish in mono.

WHY MONO STILL MATTERS

When left and right are added together, parts that are out of phase cancel out. A wide synth or a fake-stereo vocal can lose half its level, or disappear. A quick mono check catches it before your listeners do.

CHEAT BOX

STARTING POINTS

Center	**Kick, snare, bass, lead vocal**
Pairs	**50–100% left and right**
Mono check	**Every 15–20 minutes**
Mono low end	**Below about 100–120 Hz**
Correlation (phase) meter	**Mostly above 0**

TRY IT Flip your mix to mono for one chorus. Anything that vanishes needs less width or a level fix.

FREE TOOLS FOR THIS

Mono Compatibility Checker Stereo Width & Phase Meter

READ MORE

Mono compatibility and stereo width, explained

All the numbers on one page: Panning & stereo width cheat sheet

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CHAPTER 7 · VOCALS

How to mix vocals

Listeners follow the voice first. If every word is clear and the vocal sits on top of the beat, most people will call the mix good.

A vocal chain is just a few steps in order. Each step does one job.

RULES OF THUMB

1. Edit out noise and loud breaths first, then high-pass at 80–100 Hz.
2. Ride the level by hand (automation) before you lean on a compressor.
3. Two gentle compressors (about 3 dB each) often sound more natural than one heavy one.
4. De-ess at 5–9 kHz, so S sounds do not spit.
5. The vocal should sit on top of the beat, not inside it. Every word clear.

A SIMPLE VOCAL CHAIN

1. Clean edit noise and breaths, high-pass 80–100 Hz → **2. EQ** cut mud, add a little presence → **3. Compress** 3:1–4:1, 3–6 dB → **4. De-ess** 5–9 kHz, 2–4 dB → **5. Space** plate reverb and a timed delay, on sends

RIDING THE LEVEL

Singers get louder and quieter all the time. Before any compressor, turn the quiet words up and the loud ones down with clip gain or volume automation. The compressor then only has to do the last bit, and it sounds much more natural.

DE-ESSING

A de-esser is a compressor that only listens to the sharp S and T sounds. Set it so it takes 2–4 dB off the loudest ones. Too much and the singer starts to lisp.

CHEAT BOX

STARTING POINTS

High-pass	**80–100 Hz**
Compression	**3:1–4:1, 3–6 dB of reduction**
De-esser	**5–9 kHz, 2–4 dB**
Plate reverb	**1.2–2 s, 20–60 ms pre-delay**
Level check	**Every word clear at low volume**

TRY IT Listen at a very low volume. If you can still understand every word, the vocal level is right.

FREE TOOLS FOR THIS

Mix Vocals Over a Beat

Got a beat and a vocal take? It lines them up and balances them free in your browser.

All the numbers on one page: Vocal chain cheat sheet: EQ & compression

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CHAPTER 8 · TONE

How to mix kick and bass

The low end is where most home mixes go wrong, because most rooms and speakers cannot show it honestly.

The goal is simple: the kick and the bass each get their own space, and the bottom stays solid and centered.

RULES OF THUMB

1. Decide who owns the very bottom, the kick or the bass.
2. Sidechain the bass to the kick (2–4 dB of ducking), so they do not pile up.
3. Keep the low end mono below about 100–120 Hz.
4. High-pass the other tracks, so only the kick and bass live down there.

5. Tune 808s and bass lines to the song's key.
6. Check on small speakers. A little saturation helps the bass show up on phones.

SIDECHAIN, IN PLAIN WORDS

Put a compressor on the bass and let the kick trigger it. Every time the kick hits, the bass dips a few dB, then comes straight back. The kick punches through, and the low end stops getting louder and muddier where the two overlap.

CHEAT BOX

STARTING POINTS

Kick thump	**50–80 Hz**
Bass body	**60–250 Hz**
Bass on phones	**700 Hz–1.5 kHz (its harmonics)**
Sidechain duck	**2–4 dB, fast attack, release to the tempo**
Mono below	**About 100–120 Hz**

> **TRY IT** Solo just the kick and bass and loop the chorus. They should sound like one instrument, not two arguing.

FREE TOOLS FOR THIS

Spectrum Analyzer Song Key Finder Mono Compatibility Checker

All the numbers on one page: Kick & bass EQ cheat sheet

CHAPTER 9 · DYNAMICS

Mixing in groups: buses and glue

A bus is a channel that several tracks feed into. Process the bus and you treat the whole group at once.

Light bus compression is often called glue. The parts start to move together instead of side by side.

RULES OF THUMB

1. Send all the drums to one drum bus and compress them together, 2–3 dB.
2. Group backing vocals, guitars or synths the same way, so one fader moves the whole section.
3. Glue the mix bus gently: 1.5:1–2:1, 1–2 dB of reduction, slow attack.
4. No limiter on the mix bus when you send the song to mastering.

MIX INTO IT, OR ADD IT AT THE END?

Many engineers put a gentle compressor on the mix bus early and mix through it, so every balance decision already includes it. Either way works. Just keep it gentle, and bypass it now and then to check it still helps.

AUTOMATION: THE FINAL MOVES

Once the balance works, automation handles the moments that change: the vocal up a touch in the chorus, a guitar down under a verse line, a reverb send opened for one word. Small moves keep the song feeling alive without anyone noticing the mixing.

CHEAT BOX

STARTING POINTS

Drum bus	**2:1–4:1, 2–3 dB, attack 10–30 ms**
Mix bus	**1.5:1–2:1, 1–2 dB, attack about 30 ms**
Release	**Auto, or timed to the groove**
Limiter	**Off when it goes to mastering**

> **TRY IT** Bypass the drum bus compressor. If the kit suddenly sounds like separate parts, it is doing its job.

FREE TOOLS FOR THIS

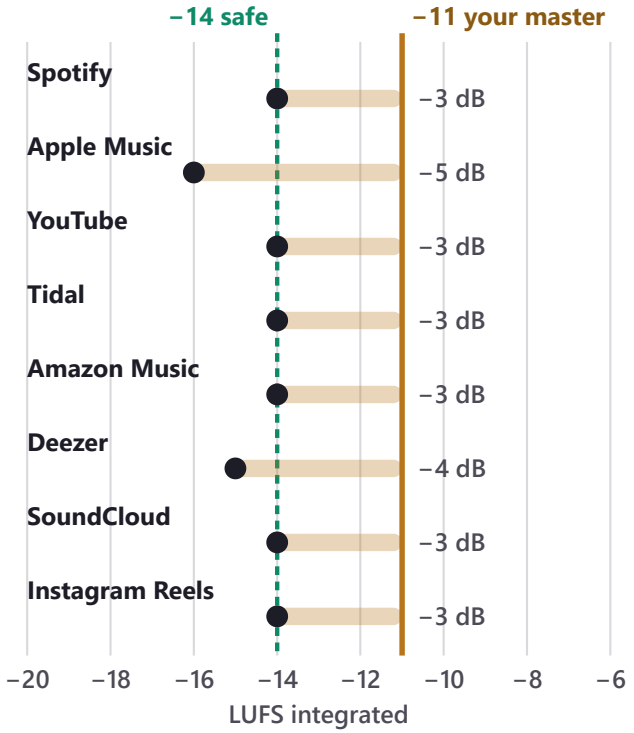
Dynamic Range Meter

All the numbers on one page: Bus & glue compression settings

Loudness and LUFS, explained

LUFS measures how loud a song feels over its whole length. Most streaming services play every song at roughly the same level, so on streaming, louder is not louder.

The second number, true peak (dBTP), keeps the file from clipping after it is converted to the formats streaming services play.



Your −11 LUFS master on each service. The bar is how far each one turns it down. Nothing is lost.

RULES OF THUMB

1. Aim around −11 LUFS integrated with a −1.0 dBTP ceiling. It is release-competitive, and the services simply turn it down to their level.
2. Want no turn-down at all? −14 LUFS is the streaming-safe option.
3. True peak matters as much as loudness. Keep it at −1.0 dBTP, the common practice, so the file does not clip after AAC or Ogg conversion. Spotify asks for −2.0 on masters louder than −14, and Amazon Music for −2.0 too.
4. Anything louder than −14 does not play louder on Spotify. It just gets turned down, and pushing far past −11 only adds squash.

5. Measure the whole song (integrated LUFS), not just the loudest chorus.
6. One master covers every platform. No need for a separate version per service.

LOUDNESS BY PLATFORM

PLATFORM	PLAYS AT LUFS	PEAK CEILING dBTP	YOUR −11 turned down
Spotify Asks for −2.0 dBTP on masters louder than −14 LUFS	−14	−1.0	−3 dB
Apple Music About −16 (Sound Check)	−16	−1.0	−5 dB
YouTube Turns loud songs down, never up	−14	−1.0	−3 dB
Tidal Levels by album	−14	−1.0	−3 dB
Amazon Music The strictest peak ceiling	−14	−2.0	−3 dB
Deezer One LU quieter than the −14 group	−15	−1.0	−4 dB
SoundCloud Sources still disagree; do not master hot for it	−14	−1.0	−3 dB
Instagram Reels About −14, leveled	−14	−1.0	−3 dB
TikTok feed Not leveled: the file plays as it is	none	−1.0	plays as is

The widely measured playback levels, as of July 2026. Apple Music, SoundCloud and Instagram are approximate, and TikTok's feed does not level songs at all. Being turned down loses nothing: the song just plays at the same level as everything around it.

TURNED DOWN, RARELY TURNED UP

Most services turn loud songs down to their playback level. Only some turn quiet songs up, and Spotify only does it within the song's headroom. So a master that is too quiet really does play quieter, while one that is far too loud just gets trimmed.

WHY TRUE PEAK, NOT JUST PEAK

A normal peak meter only reads the samples. The real waveform between them can swing higher, and lossy encoding adds a little more. A true-peak ceiling of −1.0 dBTP leaves room for both.

CHEAT BOX

STARTING POINTS

Release default	**−11 LUFS, −1.0 dBTP**
Streaming-safe	**−14 LUFS, −1.0 dBTP**
Amazon Music ceiling	**−2.0 dBTP**
Your mix before mastering	**No limiter, peaks −6 to −3 dBFS**

> **TRY IT** Load a released song in a LUFS meter, play the chorus, and compare it to your master at the same spot.

FREE TOOLS FOR THIS

Streaming Loudness Targets · What LUFS Should I Master To? · Loudness Penalty Calculator · True-Peak & Clipping Detector

READ MORE

LUFS targets for every platform · True peak and dBTP, explained · Why your song sounds quieter on Spotify

All the numbers on one page: Loudness by platform

CHAPTER 11 · BASICS

How to use reference tracks

A reference track is a released song you compare your mix to. It is the fastest way to hear what your mix is missing.

The one rule: match the loudness first. Otherwise the louder song almost always sounds better, and you learn nothing.

RULES OF THUMB

1. Pick 2 or 3 released songs in your style.
2. Turn the reference down to match your mix before you compare.
3. Compare one thing at a time: low end, vocal level, brightness, width.
4. Use good-quality files, not a low-bitrate rip.

5. Switch often. Your ears get used to anything in about a minute.

WHAT TO LISTEN FOR

Is the kick as clear? Is the vocal as loud against the beat? Is the top end as bright, or harsher? Is it as wide? Pick one question per pass. You are looking for the balance of the reference, not its exact sound.

CHEAT BOX

STARTING POINTS

Match loudness	**Within about 1 LU**
Loops	**10–20 seconds of the same section**
How many	**2–3 references**
Switch	**Every few seconds**

TRY IT Loop the chorus of your song and the reference, level-matched. Switch every few seconds and write down one difference.

FREE TOOLS FOR THIS

Reference Tonal-Balance Loudness Normalizer

READ MORE

How to master with a reference track

All the numbers on one page: Reference track quick checks

CHAPTER 12 · MASTERING

How to build a mastering chain

Mastering is the last step. It works on the finished stereo mix: a little tone shaping, a little control, then the final loudness.

The moves are small. A good master makes the song sound like itself, only finished.

RULES OF THUMB

1. Mastering moves are small: EQ of 0.5–2 dB, 1–2 dB of compression.
2. The limiter goes last. It sets the final loudness and the true-peak ceiling.

3. Fix big problems in the mix. Mastering polishes, it does not rebuild.
4. Compare before and after at the same loudness, or the louder one always wins.
5. Add dither only at the very end, and only when you lower the bit depth.

A BASIC MASTERING CHAIN

1. EQ broad, 0.5–2 dB → **2. Compress** glue, 1–2 dB → **3. Saturate** optional warmth → **4. Stereo** width check, mono lows → **5. Limit** −11 LUFS, −1.0 dBTP

WHERE GLEAM AND GLEAMAI FIT

Gleam runs these finishing steps on your mixed song, free, right in your browser. It measures your mix and moves it toward the level and tone of released songs in your genre: about −11 LUFS with a −1.0 dBTP ceiling, or −14 LUFS on Low. You get a real WAV, and nothing uploads.

GleamAI is the optional paid master ($1.99 a track). It reads your song section by section, writes a plan for that mix, renders it, then re-measures it and eases back compression or stereo width if it went too far. You pick one of five AI mastering engineers. It is a different take, not automatically better, and you can preview it free first.

WHY THE ORDER MATTERS

Each step reacts to the one before it. EQ first, so the compressor hears the balanced song. The limiter last, so nothing after it can push a peak over the ceiling.

ONLY HAVE THE FINISHED SONG OR A BEAT?

You can still master it. Mastering only needs the final stereo file, so a bounced song or a finished beat is all it takes. Gleam does it free in your browser: master your song with Gleam.

CHEAT BOX

STARTING POINTS

EQ moves	**0.5–2 dB, wide**
Compression	**1.5:1–2:1, 1–2 dB of reduction**
Limiter ceiling	**−1.0 dBTP**
Target	**−11 LUFS (or −14 streaming-safe)**

> **TRY IT** Bypass your whole mastering chain at matched loudness. If the mix sounds better without it, ease off.

FREE TOOLS FOR THIS

True-Peak & Clipping Detector Dynamic Range Meter Release-Ready Grader

READ MORE

Mixing vs. mastering How to master a song online free Make a song louder without clipping

All the numbers on one page: Mastering chain order

CHAPTER 13 · MASTERING

How to export your mix and master

The export is the file everyone else will hear. A wrong setting here can undo hours of work.

There are two exports to get right: the mix you send to mastering, and the master you release.

RULES OF THUMB

1. Mix for mastering: 24-bit WAV at the session sample rate, peaks around −6 to −3 dBFS, no limiter on the mix bus.
2. Do not normalize the export. Leave the level where you mixed it.
3. Master for release: 24-bit WAV (16-bit for CD). Add dither when you go down to 16-bit.
4. Let the last reverb tail ring out. Do not cut the end too early.
5. MP3 at 320 kbps is for previews and sharing, not for your distributor.

EXPORT SETTINGS

FILE	FORMAT	NOTES
Mix for mastering	24-bit (or 32-bit float) WAV, session sample rate	No limiter, no normalize, peaks −6 to −3 dBFS
Master for streaming	24-bit WAV, 44.1 kHz or higher	Check what your distributor accepts; −1.0 dBTP ceiling
Master for CD	16-bit, 44.1 kHz WAV	Dither when you go down to 16-bit
Preview or sharing	MP3, 320 kbps	Not for your distributor

FINAL CHECKS: EARBUDS, PHONE, CAR

Before you send the file anywhere, play it on the systems your listeners use. Earbuds show a harsh top end and a buried vocal. A phone speaker shows whether the bass still reads. A car shows the low end and how the vocal sits against road noise. Fix what bothers you on two of the three, not every tiny difference.

CHEAT BOX

STARTING POINTS

Mix file	**24-bit WAV, same sample rate as the session**
Mix peaks	**−6 to −3 dBFS, no limiter**
Master file	**24-bit WAV (16-bit for CD, with dither)**
Preview file	**MP3, 320 kbps**

> **TRY IT** Before you upload, play the exported file once from start to finish. Listen for clicks, cut-offs and a missing tail.

FREE TOOLS FOR THIS

Audio File Analyzer WAV ↔ MP3 Converter

All the numbers on one page: Export settings + final checklist

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CHAPTER 14 · BASICS

Beginner mixing mistakes to avoid

Everyone makes these. Spotting them early saves you weeks of wondering why your mix sounds off.

Each one has a simple fix. Pick the one you recognize most and start there.

RULES OF THUMB

1. Fix the big things first: levels, then EQ, then compression.
2. Change one thing at a time, then listen.
3. Check your mix on three systems before you call it done.

THE MISTAKES AND THE FIXES

- **Mixing too loud for too long**
  Turn it down to conversation level and take breaks.
- **Judging plugins at different volumes**
  Match levels before you decide. Louder almost always sounds better at first.
- **Too much low end you cannot hear**
  Check on headphones and a phone, and look at a spectrum analyzer.
- **Over-compressing**
  Back off until the song breathes again. Watch the gain reduction meter.
- **Wide bass**
  Keep everything below about 100–120 Hz in mono.
- **A clipping mix bus**
  Pull the faders down and leave about 6 dB of headroom.
- **EQing in solo**
  Make EQ decisions with the whole mix playing.
- **Too much reverb**
  Turn the send up until you hear it, then back it off a little.
- **A vocal buried in the beat**
  Ride the vocal level and carve a little room for it with EQ.
- **Mastering a mix that is not done**
  Fix balance problems in the mix. Mastering only polishes.
- **Chasing loudness**
  Aim for about −11 LUFS. Much louder just gets turned down on streaming.
- **Never comparing to a reference**
  Level-match a released song and check against it every so often.

CHEAT BOX

STARTING POINTS

Fix first	**Levels, then EQ, then compression**
Check on	**Headphones, a car, a phone**
Headroom	**Mix bus peaks −6 to −3 dBFS**
Loudness	**About −11 LUFS, −1.0 dBTP**

TRY IT Pick the one mistake you recognize most and check your current mix for just that.

FREE TOOLS FOR THIS

Release-Ready Grader

All the numbers on one page: Common mix mistakes & quick fixes

Glossary of mixing terms

Mixing has a lot of words. You only need a few dozen of them, and here they are in plain English.

RULES OF THUMB

1. dBFS is the level inside your computer. 0 is the ceiling.
2. LUFS is how loud a song feels over its whole length.
3. dBTP is the true peak, the real top of the waveform.

THE WORDS, A TO Z

Attack
How fast a compressor starts turning the sound down once it crosses the threshold.

Automation
Fader or knob moves recorded into the song, like turning the vocal up in the chorus.

Bit depth
How finely each sample is measured. 24-bit leaves lots of room below the ceiling; 16-bit is the CD format.

Bounce
Rendering your mix or master to an audio file. Also called export.

Bus
A channel that several tracks feed into, like all the drums.

Clipping
When the level tries to go past the ceiling and the tops of the waveform get cut off. It sounds harsh.

Compressor
A tool that turns a sound down when it gets louder than the threshold, so the level stays more even.

dB (decibel)
The unit for level. 1 dB is a small change; about 10 dB sounds roughly twice as loud.

dBFS
Decibels relative to full scale: the level inside your computer. 0 dBFS is the ceiling.

dBTP
True peak. The real top of the waveform, including peaks that land between samples.

De-esser
A compressor that only reacts to sharp S and T sounds.

Delay
An echo of the sound, often timed to the beat.

Dither
Very quiet noise added when you lower the bit depth, so fades and quiet parts stay smooth.

Dry / wet
Dry is the untouched sound, wet is the effect. A mix knob blends the two.

Dynamic range
The difference between the quiet and loud parts of a song.

EQ
Equalizer. A tool that turns frequency ranges up or down.

Frequency
How low or high a sound is, in hertz (Hz). People hear from about 20 Hz to 20 kHz.

Gain
The level going into a track, a plugin or a device.

Gain reduction
How many dB a compressor or limiter is turning the sound down right now.

Gain staging
Setting healthy levels at every step, so nothing clips and every plugin behaves.

Headroom
The space between your loudest peak and 0 dBFS.

High-pass filter
Removes the lows below a set point and lets the highs pass.

Insert
An effect placed right on one track, so all of its sound goes through it.

Integrated LUFS
The loudness of the whole song from start to finish. The number streaming services use.

Knee
How gently a compressor starts working around the threshold.

Limiter
A fast compressor with a very high ratio that keeps peaks under a ceiling. It goes last in mastering.

Low-pass filter
Removes the highs above a set point and lets the lows pass.

LRA (loudness range)
How much the loudness moves between the quiet and loud parts, in LU.

LUFS
Loudness units relative to full scale. How loud a song feels over time.

Makeup gain
Level added after a compressor, so it is as loud as before.

Mastering
The last step: polishing the finished mix and setting its loudness for release.

Mixing
Balancing and shaping all the tracks of a song into one stereo file.

Mono
One channel: left and right added together.

Mono compatibility
How well your mix holds up when left and right are added together.

Mud
A cloudy, crowded sound, usually from too much 200–500 Hz.

Normalization
When a streaming service turns songs up or down so they play at about the same loudness.

Panning
Placing a sound between left and right.

Phase
The timing between two similar signals. Out of phase, they cancel each other and sound thin.

Pre-delay
A short gap before a reverb starts, so the dry sound stays clear and up front.

Q
How wide an EQ band is. A high Q is narrow, a low Q is wide.

Ratio
How hard a compressor turns down. At 4:1, a sound 4 dB over the threshold comes out 1 dB over.

Reference track
A released song you compare your mix to.

Release
How fast a compressor lets go once the sound drops back under the threshold.

RMS
A kind of average level. Closer to how loud something feels than the peak is.

Sample rate
How many times per second the audio is measured. 44.1 kHz and 48 kHz are the usual ones.

Send / aux
A side channel many tracks feed into, usually for reverb or delay.

Sibilance
Sharp S and T sounds in a vocal, usually around 5–9 kHz.

Sidechain
Letting one sound control a compressor on another, like the kick ducking the bass.

Stem
A group of tracks bounced together, like all the drums.

Threshold
The level where a compressor starts to work.

CHEAT BOX

STARTING POINTS

Digital ceiling	**0 dBFS**
Streaming level	**About −14 LUFS**
Release default	**About −11 LUFS**
True-peak ceiling	**−1.0 dBTP**

TRY IT Bookmark this page. Come back whenever a plugin uses a word you do not know.

All the numbers on one page: Mixing & mastering glossary

FAQ

Questions people ask

What is the difference between mixing and mastering?

Mixing balances the tracks into one stereo file; mastering polishes that file and sets its loudness. Mixing vs. mastering, explained.

How loud should my mix be before mastering?

Leave the mix bus peaking around −6 to −3 dBFS, with no limiter on it. That headroom matters more than the average level.

What is a good gain staging level?

Record with peaks around −10 to −6 dBFS, trim each track to average about −18 dBFS, and keep the mix bus peaking around −6 to −3 dBFS.

What LUFS should I master to?

About −11 LUFS with a −1.0 dBTP ceiling, or −14 LUFS if you want no turn-down at all. Find the right LUFS for your song.

Should I use true-peak limiting?

Yes. Set the limiter's ceiling to −1.0 dBTP with true-peak detection on, so the file does not clip after AAC or Ogg conversion. True peak and dBTP, explained.

Do I need a different master for each streaming service?

No. One master covers them, because each service sets its own playback level, mostly by turning loud songs down. Use a −2.0 dBTP ceiling if Amazon Music matters to you.

What order should a vocal chain be in?

A common order is: clean up and high-pass, EQ, compression, de-essing, then reverb and delay on sends. It is a starting point, not a rule.

Should I mix on headphones or studio monitors?

Either works if you know it well. Speakers show how the mix sounds in a room; headphones show small details and keep the room out of it. Check the mix on both, plus a phone and a car.

Can I mix and master with free or stock plugins?

Yes. The EQ, compressor, reverb, delay and limiter that come with your DAW can do everything in this handbook. The settings matter far more than the brand of plugin.

Can I do this in FL Studio, Ableton, Logic, GarageBand or BandLab?

Yes. Every step uses tools that come with any DAW: faders, EQ, a compressor, reverb, delay and a limiter. The names change a little; the steps stay the same.

How long does it take to learn mixing and mastering?

It is a skill that keeps growing. Follow the chapters in order on a few songs and your mixes get clearer quickly; after that, every song teaches you something new.

Can I print this handbook?

Yes. Download the free PDF, or use your browser's Print on this page. It prints as a small book with a cover, a numbered contents page and the chapters in order.

Master a track free at trackgleam.com · All the numbers on one page: the mixing & mastering cheat sheet