EQ It

Technique Before Technology

How to capture great sound, mix efficiently, and use equalization only when it earns its place

by

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Revised from the 1995 crew reference

Why this edition is different

This booklet began as a ready-reference for my recording crew. It was meant to answer a practical question quickly: "How do I EQ this?" The frequency suggestions were useful, but the more important lesson was always the method behind them. This revised edition makes that method explicit. It is a case for capturing the right sound before the signal reaches the equalizer, tracking without unnecessary processing, judging every decision in the context of the mix, and using EQ only when it earns its place. This is not nostalgia and it is not gear worship. It is a production method. The so-called “old ways” often reach a convincing result faster because they solve problems near their physical source instead of creating a chain of electronic corrections that must later be corrected again.

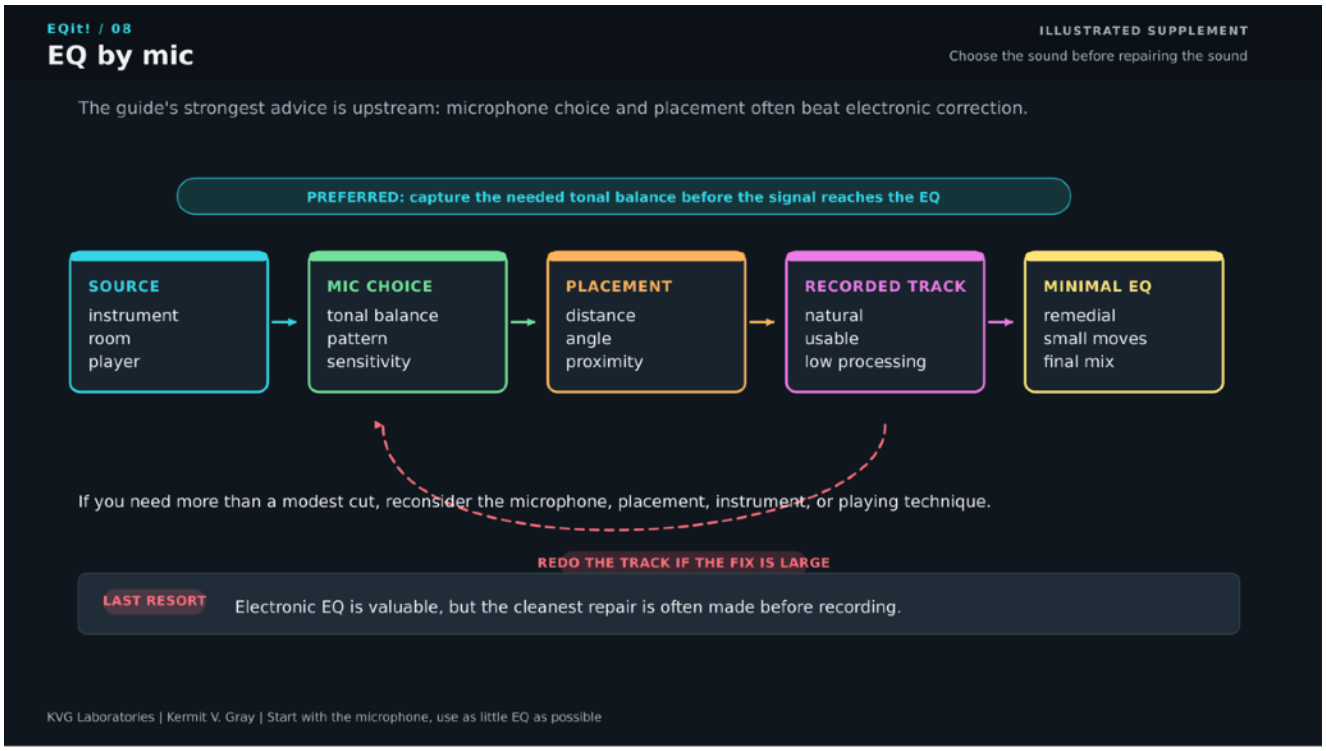
The best recording would need no EQ at all. That ideal is not always possible, and EQ remains a useful creative and corrective tool. But the less work it has to do, the more natural, dynamic, and emotionally convincing the recording is likely to remain.

The central proposition is: **Technique comes before technology.** Choose the source, room, microphone, placement, balance, and level carefully. Record the result cleanly. Then let the mix tell you whether anything still needs to change.

The recording is made before the mix

Equalization is often asked to repair a decision that should have been made earlier. A microphone may be too bright, too dull, too close, too distant, or simply wrong for the source. A small change in microphone choice or placement can accomplish more than an elaborate chain of processing.

Listen to the room. Listen to the instrument. Listen to the performer. Select a microphone whose natural tonal balance is appropriate, then fine-tune the result with distance, angle, height, and position. The recording should already be moving toward the sound you want before electronic correction enters the discussion.



This is what I mean by EQing by mic. The microphone and its position become the first equalizer. Unlike an electronic equalizer, they also change perspective, depth, transient balance, room contribution, and the relationship between the source and the listener.

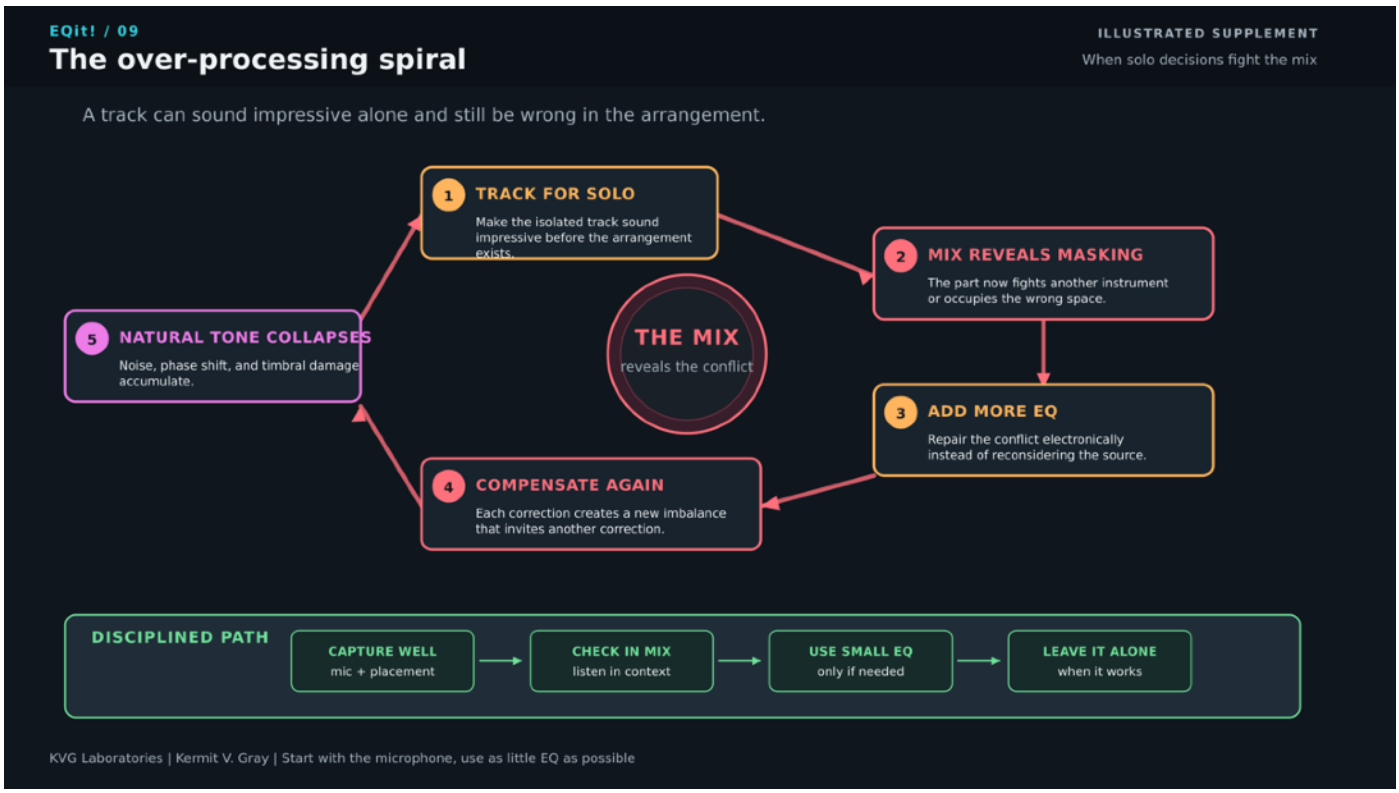
If a track requires a large corrective cut, the problem is usually not an EQ problem. Reconsider the microphone, the placement, the instrument, the room, or the playing technique.

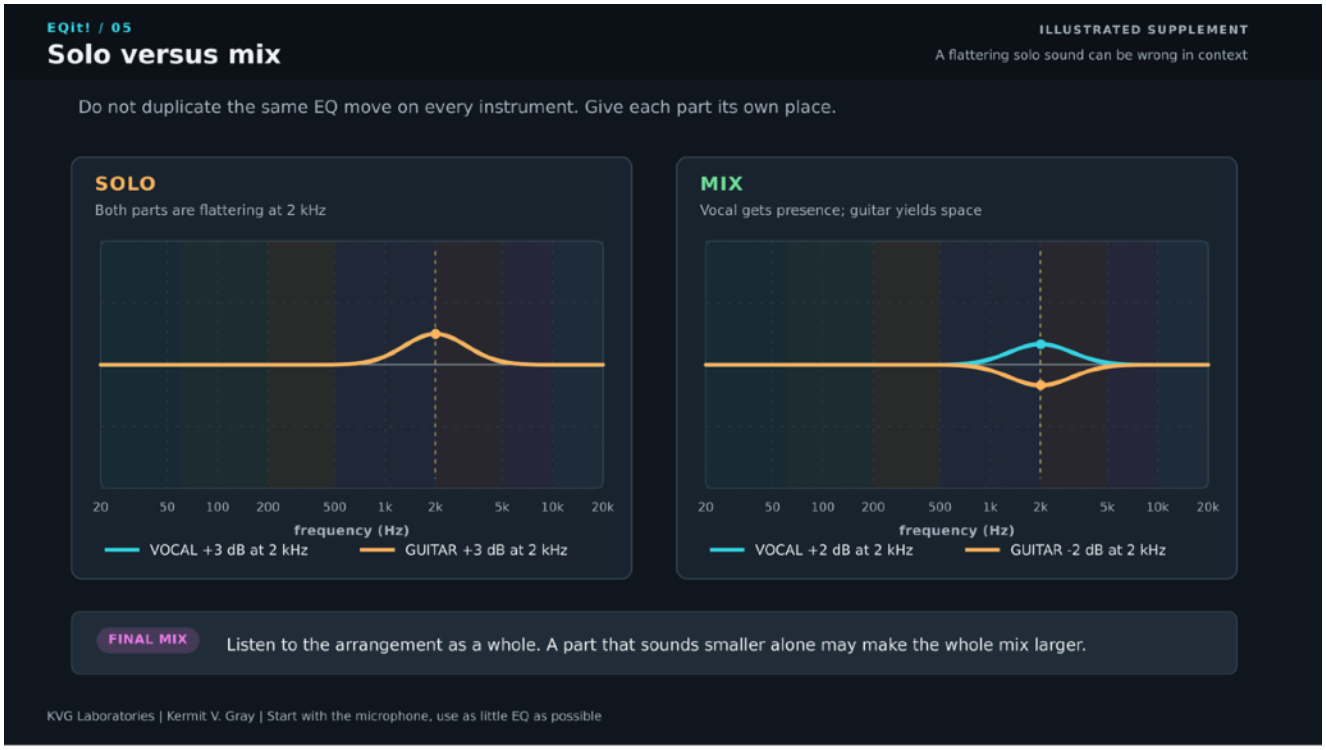
Do not track for the solo button

A common modern habit is to equalize a track at the beginning so that it sounds finished when soloed. The track may become brighter, deeper, louder, or more exciting by itself. That does not mean it will occupy the correct place in the arrangement.

The solo button is an inspection tool, not the final audience. A vocal that sounds beautiful alone may mask the guitar. A guitar that sounds enormous alone may bury the vocal and bass. If every instrument is shaped to sound impressive in isolation, the mix becomes a collection of competing finished sounds.

The final EQ decision belongs in the mix. If a part needs a small change to fit the arrangement, establish that change there. Do not duplicate the same EQ move from instrument to instrument. Distinction is created by giving each part its own space, not by making every part brighter or fuller.





Track dry and keep options open

Tracking dry does not mean tracking carelessly. It means capturing the source without committing an electronic correction that has not yet proved necessary. The clean track preserves the natural dynamics and tonal relationships of the performance and leaves the mix engineer room to make decisions later.

In the analog era, this discipline was reinforced by the equipment itself. Equalizers could add noise, consume headroom, alter phase relationships, and introduce coloration. A good analog EQ could be beautiful, but it could also damage an otherwise good recording very quickly. You learned to ask whether the improvement was worth the cost.

Modern digital equalizers may be technically cleaner, but technical cleanliness does not make a wrong decision right. Repeated processing still consumes attention, complicates recall, and encourages the engineer to repair a chain of earlier choices instead of reconsidering the source.

If an effect is deliberately part of the sound, it should be treated as a creative recording decision. EQ used to make a poorly captured sound acceptable is a different matter. That is remedial processing, and it should remain the last resort.

The old method is faster

The source-first method appears to take more time because it asks for thought before recording. In practice, it usually saves time. A few minutes spent listening, moving the source, changing the microphone, or adjusting its position can prevent hours of corrective EQ, editing, automation, re-amping, and mix revision.

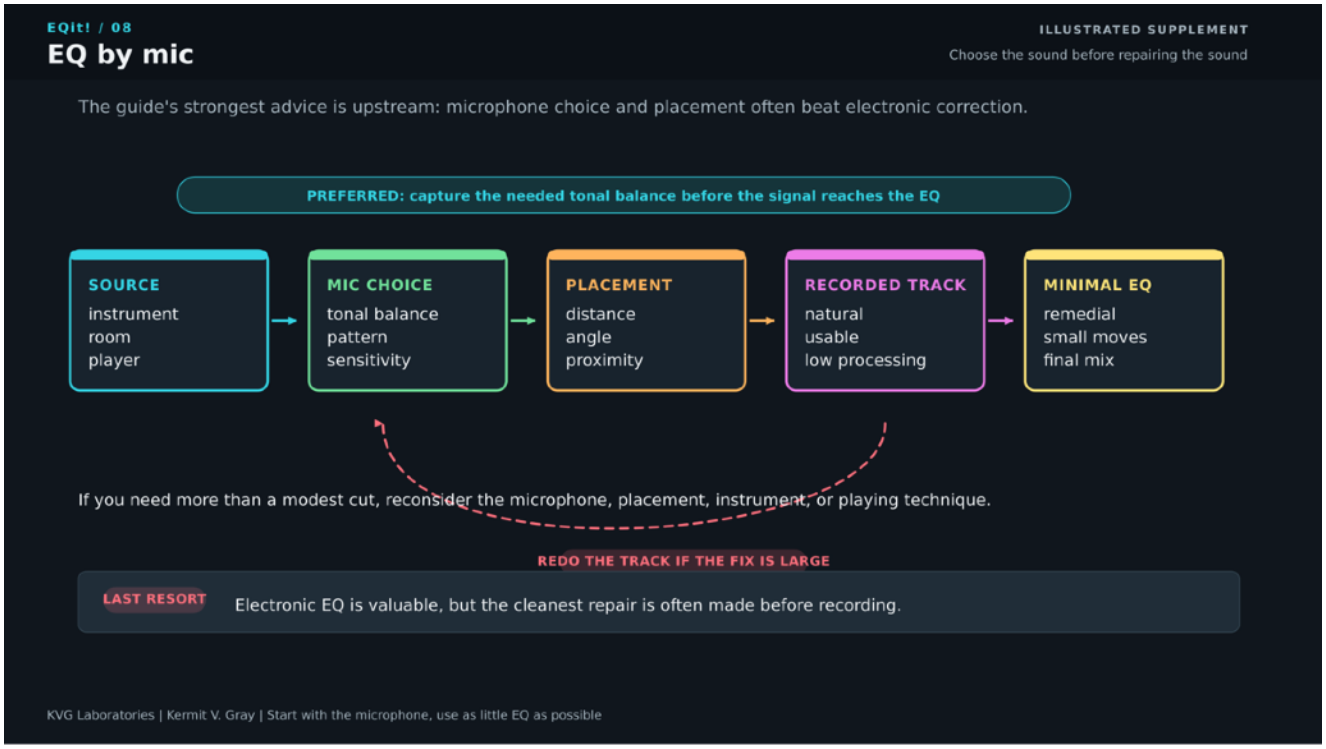
Efficiency is not the number of controls available. Efficiency is the time required to reach a convincing, repeatable result. A simpler signal path creates fewer unknowns. Fewer unknowns make decisions easier to hear, easier to recall, and easier to explain to the rest of the crew.

Poor preparation creates redundant tracks. Redundant tracks create editing. Editing creates more opportunities for tonal and dynamic inconsistency. Heavy processing then attempts to make the pieces sound as though they belonged together from the beginning. A disciplined method interrupts that chain at its source.

Technique, not technology, is the reason a recording project becomes efficient. This booklet's method does not reject technology; it puts technology in its proper place.

A practical source-first workflow

1. Prepare the room and the arrangement. Decide what the listener should hear and where the important relationships should exist.
2. Listen to the source before reaching for a control. Identify what is naturally strong, weak, harsh, dull, resonant, or masked.
3. Choose the microphone for the source and the desired tonal balance. Do not choose a microphone merely because it is fashionable or familiar.
4. Adjust placement. Change distance, angle, height, and position before changing electronic tone controls.
5. Set a clean recording level with enough headroom. Record the performance dry unless a deliberate effect is part of the sound.
6. Build a rough mix before making corrective EQ decisions. Listen to the part in the arrangement, not only in isolation.
7. If EQ is needed, make the smallest useful change. Compare with bypass and decide whether the mix is genuinely better.
8. If the correction becomes large, stop and reconsider the source. Redoing a track is often faster than repairing it indefinitely.

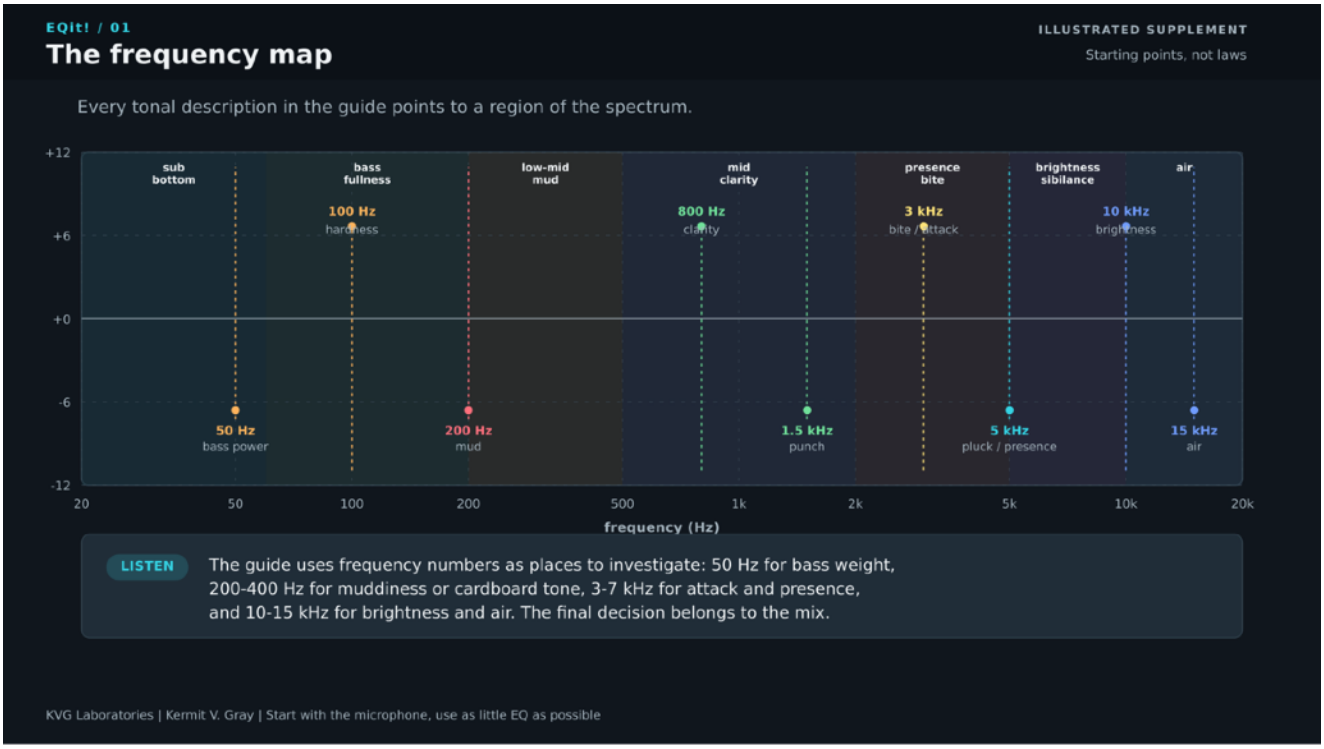


When EQ earns its place

EQ is a tone control with extraordinary flexibility. It can correct a recording, alter tonal balance, create a mood, emphasize an aesthetic, or help a part fit the final arrangement. The issue is not whether EQ is allowed. The issue is whether it is doing a necessary job.

Think of EQ as remedial. Use it when something is not right, not simply because an equalizer is available. The ideal recording would use no EQ at all. When EQ is needed, use as little as possible and apply it in small increments.

The frequency numbers in the reference pages are places to investigate, not recipes. A frequency that adds clarity to one source may make another source brittle. A frequency that sounds full in solo may make a mix muddy. The final judgment is always made by listening.



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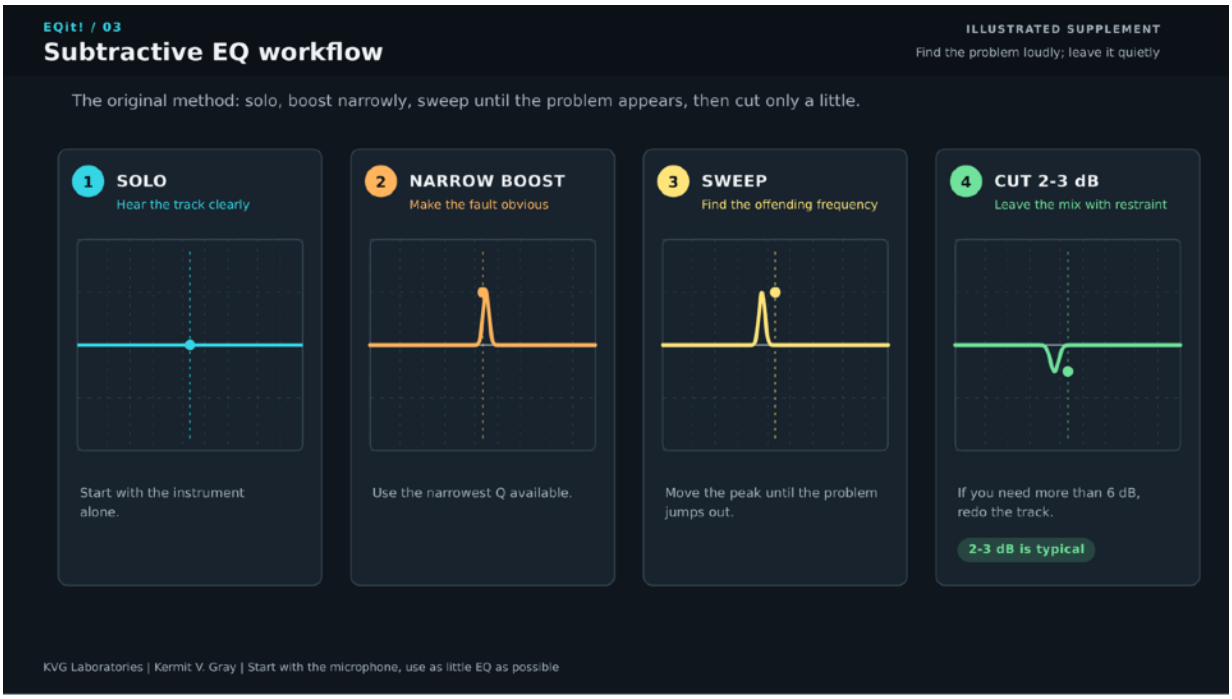
Subtractive EQ finds the problem then reduces it

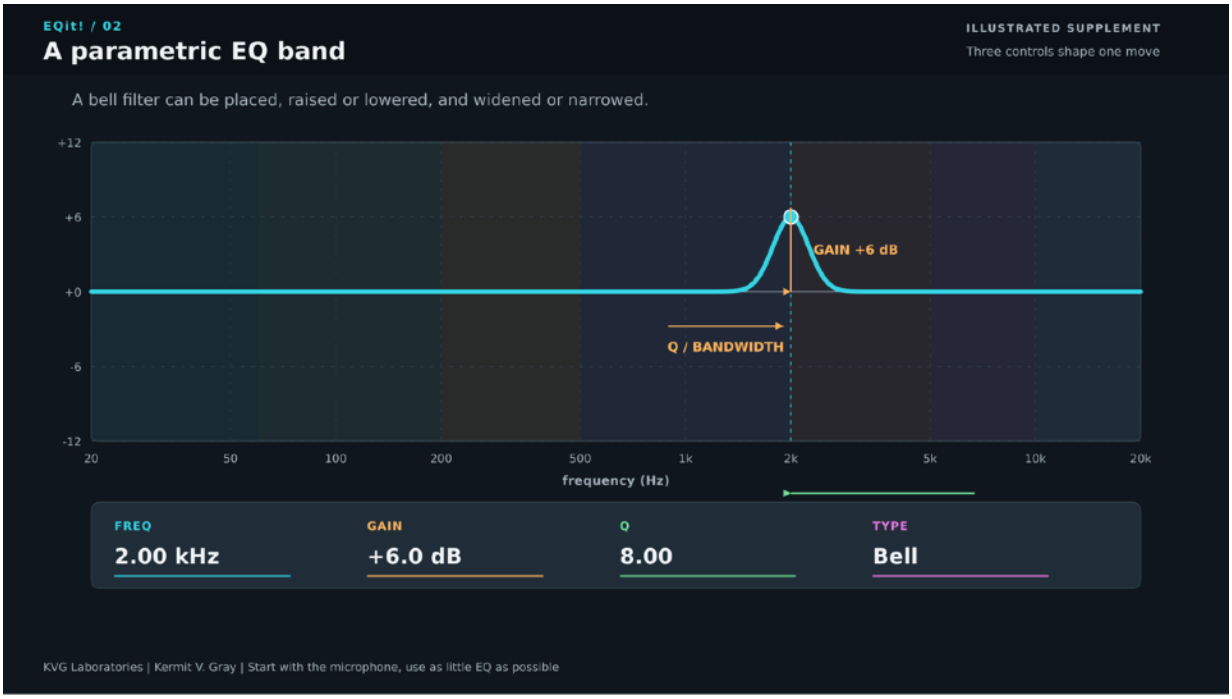
Subtractively EQ whenever possible. The purpose of the boost in this method is not to create the final sound. It is to make the unwanted frequency obvious enough to identify.

First, solo the instrument long enough to locate the problem. Second, boost the EQ with the narrowest Q that is practical. Third, sweep through the frequencies until the problem becomes unmistakable. Fourth, cut that frequency by only a small amount. Typically, 2 or 3 dB is enough.

If you find yourself cutting more than 6 dB, you probably have a recording problem that EQ will not truly fix. Redo the track with a different microphone, microphone placement, instrument, or playing technique.

After locating the problem in solo, return immediately to the mix. A change that sounds correct by itself may be completely wrong when the other instruments are present.





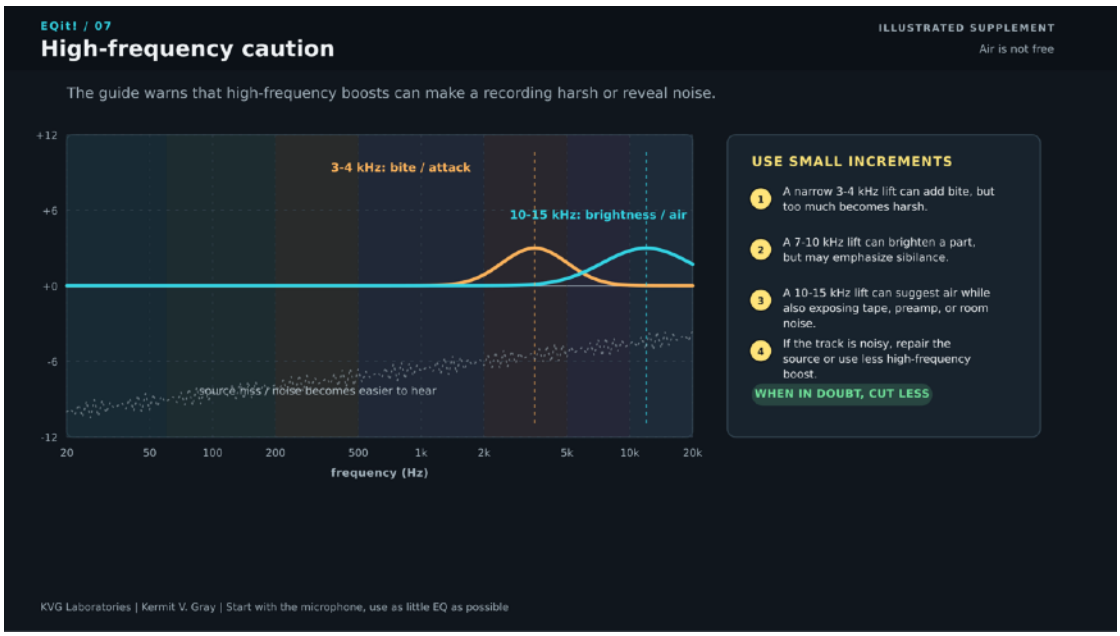
Frequency, gain, and Q describe the three basic controls of a parametric equalizer’s band.

Shape amount and a high-frequency caution

A bell, shelf, high-pass filter, low-pass filter, or notch does not merely change how much EQ is applied. It changes how widely the change reaches. Choose the shape first, then use the smallest amount that accomplishes the job. Be especially careful when boosting high frequencies. A lift around 3 or 4 kHz can bring out bite and attack, but it can also make electric guitars, vocals, and similar sounds harsh. Higher boosts can add brightness or air, but they can also reveal hiss, sibilance, tape noise, preamp noise, or room noise. Noisy recordings are no fun to listen to. If high-frequency boost makes the noise obvious, the correct answer may be less boost or a better source rather than another processor.



Brightness, harshness, and hiss are close neighbors.



Final mix judgment

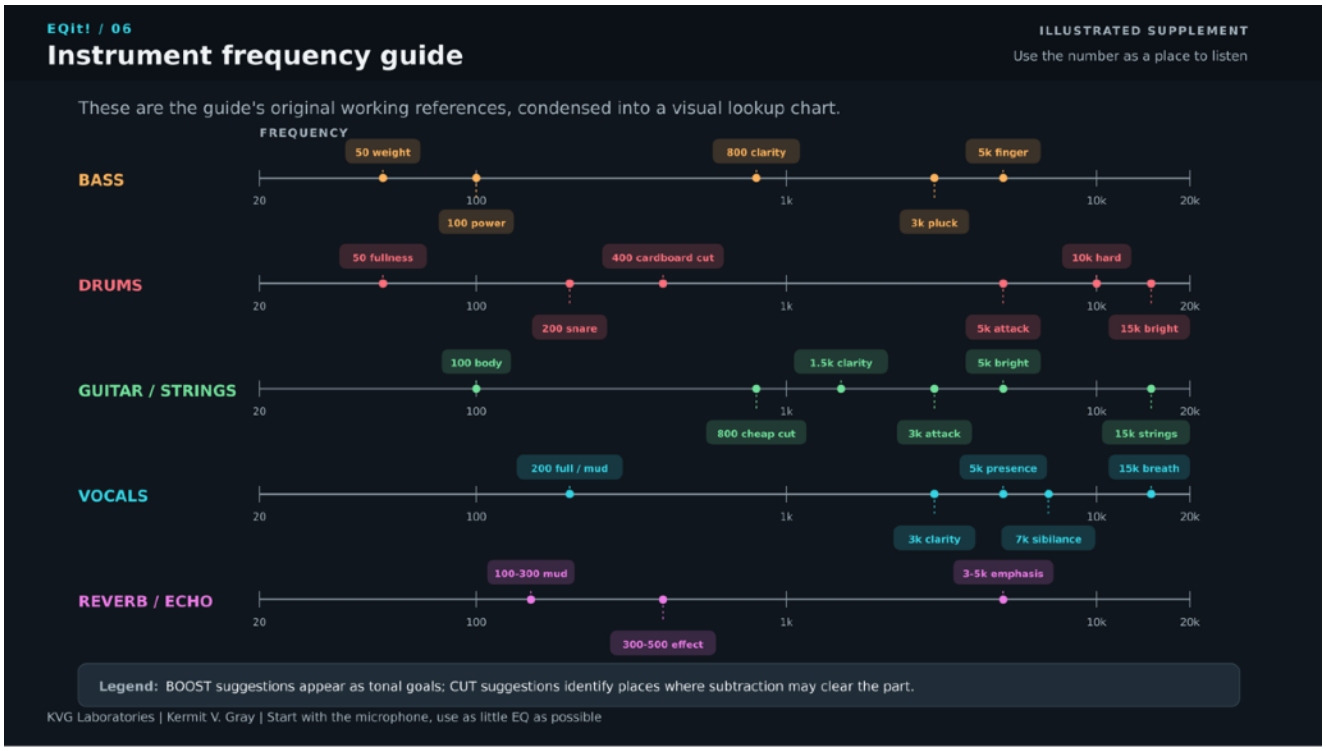
Always make final EQ decisions in the mix, not in solo. Compare the processed and bypassed sounds at a sensible monitoring level. Ask whether the change improves the musical relationship, not merely whether it makes the isolated track more impressive.

Do not duplicate EQ from instrument to instrument. If the vocal needs presence, that does not mean every guitar, keyboard, and drum needs the same presence boost. The final mix becomes clearer when the parts are allowed to differ.

When in doubt, do less. A recording that retains its dynamics, depth, transient life, and natural tonal relationships will usually survive different playback systems better than one that has been repeatedly optimized for a single monitoring situation.

Quick reference starting points

The following suggestions are retained from the original crew reference. They are starting points, not promises. Listen in the mix, use small increments, and remember that microphone choice and placement come first.



Bass guitar cello and upright bass

- To reduce the boom of the bass, boost at 50 Hz.
- To un-bury overtones, boost at 50 Hz.
- To increase the bass line in a final mix, boost at 50 Hz.
- To increase loud rock bass lines, boost at 50 Hz.
- To add a harder bass sound to low-frequency instruments, boost at 100 Hz.
- To add more power to low-frequency instruments, boost at 100 Hz.
- For increased clarity of bass guitar, cello, or upright bass, boost at 800 Hz.
- For increased clarity of bass guitar, cello, or upright bass, boost at 1.5 kHz.
- For punchier bass guitar, cello, or upright bass, boost at 800 Hz or 1.5 kHz.
- For more pluck on bass, boost at 3 kHz.
- For more finger sound on bass, boost at 5 kHz or 7 kHz.

Drums

- To add fullness to kick, floor tom, and bass drum, boost at 50 Hz.
- To add fullness to snare, boost at 100 Hz.
- To add fullness to snare for a harder sound, boost at 200 Hz.
- To reduce the gong sound of cymbals, cut at 200 Hz.
- To reduce the cardboard sound of low-pitched drums and toms, cut at 400 Hz.
- To reduce ambiance on cymbals, cut at 400 Hz.
- For greater attack on low-frequency drums, boost at 5 kHz.
- For greater attack on floor or rack toms, boost at 5 kHz.
- To add attack to low-frequency drums and a more metallic sound, boost at 7 kHz.
- To give snares a more metallic sound, boost at 7 kHz.
- To add attack to percussion instruments, boost at 7 kHz.
- For added hardness on cymbals, boost at 10 kHz.
- To brighten cymbals, boost at 15 kHz.

Echo and reverb

- To prevent reverb or echo from muddying the mix, cut at 100, 125, 150, 200, or even 300 Hz.
- To create a cave sound, boost at 100 Hz.
- To emphasize reverb or echo, boost at 3 kHz or 5 kHz.
- To get an Elvis-style echo, use a broad parametric bell centered at 300 or 500 Hz.

General

- To reduce muddiness of mid-range instruments, cut at 200 Hz.
- To add clarity to bass lines, especially when speakers are at low volume, boost at 400 Hz.
- To bring a part forward, use a broad parametric bell centered at 2 kHz.
- To send a part backward, cut with a broad parametric bell centered at 2 kHz.
- To make background parts more distant, cut at 5 kHz.

Guitar and strings

- To add fullness to guitars, boost at 100 Hz.
- To remove boom on guitars, cut at 100 Hz.
- To add clarity to guitars, cut at 100 Hz.
- To add fullness to guitar for a harder sound, boost at 200 Hz.
- To make cheap-sounding guitars sound less cheap, cut at 800 Hz.
- To remove dullness from guitars, boost at 1.5 kHz.
- For more attack from electric or acoustic guitar, boost at 3 kHz.
- To disguise out-of-tune guitars, cut at 3 kHz.
- To accentuate the attack of acoustic guitar, boost at 5 kHz.
- To add brightness to guitars, especially rock guitars, boost at 5 kHz.
- To soften thin guitar, cut at 5 kHz.
- To add sharpness to rock guitar or acoustic guitar, boost at 7 kHz.
- To brighten string instruments, boost at 15 kHz.
- To add light brightness to acoustic guitar, boost at 10 kHz.

Horns and woodwinds

• To add warmth to horns, boost at 100 Hz.
• To reduce shrillness of horns, cut at 5 kHz or 7 kHz.
• To brighten flutes and woodwinds, boost at 15 kHz.

Keyboards and piano

• To add warmth to piano, boost at 100 Hz.
• For more attack on low piano parts, boost at 3 kHz.
• To accentuate the attack of piano, boost at 5 kHz.
• To add sharpness to synthesizers and piano, boost at 7 kHz.
• To make a sampled synthesizer sound more real, boost at 15 kHz.
• To add light brightness to piano, boost at 10 kHz.

Vocals

• To add fullness to vocals, boost at 200 Hz.
• To reduce muddiness of vocals, cut at 200 Hz.
• For more clarity or hardness on voice, boost at 3 kHz.
• To reduce breathiness or soft sounds of background vocals, cut at 3 kHz.
• To disguise out-of-tune vocals, cut at 3 kHz.
• For greater vocal presence, boost at 5 kHz.
• To brighten a dull singer, boost at 7 kHz - or send them to college.
• To brighten vocals, boost at 10 kHz.
• To reduce sibilance, the s sound on singers, cut at 7 kHz or 10 kHz.
• To brighten vocals by emphasizing breath sound, boost at 15 kHz.

Before you reach for EQ

- Is the source itself right?
- Is the room helping or hurting?
- Is this the right microphone for the source?
- Can a small change in placement solve the problem?
- Have I listened to the part in the mix?
- Would level, pan, arrangement, or performance solve it more naturally?
- Is this EQ move remedial, musical, or merely making the solo track impressive?
- Is the change small enough that I would still recognize the original sound?
- Does bypassing the EQ make the mix worse, or merely make the solo track less exciting?
- If the correction is large, should I redo the track?

You can almost never go wrong by not EQing. Use as little EQ as possible, make the recording right at the source, and let the mix tell you what remains to be done.

Have fun and make great music.

No animals were harmed during the making of this book. The author did sustain critical injuries from paper cuts.