

Musician

- ON A MISSION -

EQ CHEAT SHEET

FREQUENCY SPECTRUM

Frequency Range	Description
20Hz-60Hz	Sub-bass
60Hz-200Hz	Bass
200Hz-600Hz	Lower mids
600Hz-3kHz	Mids
3kHz-8kHz	Upper mids
8kHz-20kHz	Highs

Description	Frequency Range
Rumble	25Hz -- 40Hz
Bottom	60Hz -- 90Hz
Boom/Punch	100Hz -- 170Hz
Warmth	130Hz -- 220Hz
Fullness/Mud	250Hz -- 450Hz
Honk	450Hz -- 1kHz
Tinny	1kHz -- 2kHz
Crunch	2kHz -- 4kHz
Edginess/Brittleness	3.5kHz -- 6kHz
Sibilance (in voice)	4kHz -- 10kHz
Definition	6kHz -- 10kHz
Piercing	8kHz -- 12.5kHz
Air	15kHz -- 20kHz

IMPORTANT: Don't use these charts when you're mixing, or try to avoid it.

They are just there to give you an idea of how different frequencies sound.

Every now and then it's okay, but don't become reliant on them. Instead, use your ears and sweep around with the EQ when mixing if you can't find the range you are looking for.

4 KEY APPROACHES

1. Remove nasty elements
 - a. Narrow cuts to remove room resonances
 - b. High pass filter (only if needed) to remove low end noise
 - c. Do this in solo as part of the preparation phase
2. Enhance pleasing elements
 - a. Wider cuts and boosts to shape the tone
 - b. Be bold if necessary - but only if you know what you are doing
3. Make things sound different
 - a. For example, filtering all the lows and highs to create the 'telephone' sound on vocals
4. Create space in the mix using range allocation
 - a. Don't boost two different channels in the same frequency range
 - b. Instead, carve out space for important parts e.g. vocals or lead guitar

11 EQ MISTAKES TO AVOID

1. Using EQ without intention
2. Only using subtractive EQ
3. Only using EQ on individual channels
4. Not being aggressive when you need to be
5. Using the solo button
6. Applying a hi-pass to every track
7. Wasting time and money on plugins
8. Not using the bypass button
9. Worrying about plugin order
10. Not learning the frequency spectrum
11. Not training your ears

EQ IN DIFFERENT GENRES

Mainstream and pop

- Applies to any music that you wanted to sound modern and polished
- Lots of top end boosts for high fidelity sheen
 - Especially above 12kHz
 - Can even do this on the mix buss
 - Analogue modelling ideally

Hip-hop

- A lot of hip hop is now treated more like Pop
- Less top end sheen
 - More aggression in upper mid

Rock

- Similar to hip hop for EQ
 - Less top end, more aggression in upper mids (4-8kHz)
 - More warmth and thickness

10 ESSENTIAL TIPS TO TRY TODAY

1. Have an intention
2. Don't rely on EQ alone, especially to shape tone
3. Prioritize cuts, but still use boosts
4. Avoid applying EQ in solo
5. Small changes soon add up
6. Be more subtle with stock parametric EQs
7. Don't obsess over plugin order
8. Get it right in the recording phase
9. Create instant clarity by removing muddiness (200-500Hz)
10. Mix in mono

Hardcore and metal

- Similar to rock
 - But can get away with even more compression
 - EQ, similar to rock, but can be more aggressive in upper mids

Acoustic

- Maintain integrity when mixing
 - Even more crucial to get the best sound in recording phase
- Very subtle EQ

RECOMMENDED PLUGINS

- Stock EQ – A lot of DAWs now have a stock EQ that models an analogue unit, don't upgrade for the sake of it!
- Slick EQ – A great free option for analogue modelling.
- FabFilter Pro-Q 2 - An incredible fully parametric EQ.
- Waves Renaissance EQ - Highly affordable parametric EQ, this whole range is great for the price.
- Slate VMR – You get two awesome analogue equalizers with this versatile plugin.
- Waves SSL E-Channel – A classic plugin that always sounds great.

FURTHER TRAINING (IN-DEPTH VIDEOS)

- [How to Use an Equalizer](#)
- [Muddy Mix? Here Are 3 Simple Ways to Fix It](#)
- [Why Your Mixes Sound Thin \(and What to Do About It\)](#)
- [Range Allocation: How to Give Your Mixes Room to Breathe](#)
- [The Perfect Place for EQ in Your Plugin Chain](#)

- [Backwards Mixing: How Mixing in Reverse Leads to Better, Faster Mixes](#)

- [How To Use EQ Boosts To Find The Nasty Stuff](#)

Fundamentals of
Audio, Lighting,
and Stage Design

John Schneck
Mission Church
April 22, 2023



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Why?

- Enable people to easily see and hear what is going on in the room
- Keep décor fresh/modern
- Provide interesting backdrop for the stream
- Provide quality sound to the stream
- Give members an opportunity to bring glory to God through the use of their talents
- Fellowship/Discipleship – build relationship between team members and provide opportunity for them to grow spiritually

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Make
Disciples

Take advantage of the opportunity to mentor people not just in the skills you need them to have, but also in the things of the Lord.

3

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'Let
There Be
Light'
Connect
Group

- Basic Format
 - 10 min – Practice/Questions from last meeting (before meeting starts)
 - 15 min – Prayer and Devotional
 - 10 min – Testimony from one of the members
 - 30 min – Lecture/Demonstration on a technical topic
 - 30 min – Experimentation/Practice/Discussion
- Sample Curriculum

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Audio Fundamentals

- What is sound?

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Important Wave Attributes

- Amplitude – the bigger the wave the louder it is
- Frequency – usually expressed as hertz (waves per second)

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What can we hear?

Whales: 1 Hz to 100 Hz
 Humans: 100 Hz to 10,000 Hz
 Bats: 10,000 Hz to 100,000 Hz
 Medical ultrasound: 1,000,000 Hz to 1,000,000,000 Hz

Frequencies of sound and average range of hearing

- Humans can typically hear 20 – 20,000 hz.
- The higher the frequency, the higher the pitch of the sound.

Reference: <https://www.pasco.com/products/igels/handwaves>
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Complex sounds are made up of many separate frequencies

Complex sound wave

300 Hz

400 Hz

450 Hz

Single frequencies

Reference: <https://www.jasco.com/products/guides/sound-waves>

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Real Time Analyzer (RTA)

- Shows breakdown of frequencies and their relative volumes
- Indicates loudest frequency (Peak)
- Indicates overall volume

Active RTA iPhone app: <https://apps.apple.com/us/app/octave-rt-a/id569156857>

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Microphone converts sound to electrical waves

Sound Waves

Microphone Transducer

Microphone Output Signal

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Sound System Components

Microphone

Mixer

Signal Processor

Power Amplifier

Loudspeaker

Playback Device

Electronic Instrument

Audio Recorder

Audio For-Video Feed

Hearing Assistance System

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