About The Author
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Alex first picked up a bass when studying engineering at university, and his quest for sonic perfection led him to found Barefaced Audio, while also leading The Reluctant, an alt-ska/funk outfit.

But This Goes to 11...

Does Tone Matter … I Mean, Really?

We asked this a few months back and came to the conclusion that it's an integral part of the melodic musicality of the bass guitar. So what about the other aspects of bass, like the rhythm and harmony? Let's first look at the rhythmic function of the bass guitar as that's often the dominant function and also the one that we have more control of as bass players rather than composers (though many of us are composers, whether it be the whole song or 'just' the bassline).

Thump, Punch and Bite

One way to look at the rhythmic function of the bass guitar is to compare it to how basic drum patterns are constructed, with the kick providing the downbeat thump, the snare providing the backbeat punch and the hi-hat providing the subdividing bit. In pretty much all genres bar reggae (and its relations), the bass guitar grooves in a similar manner to a drum kit, and the ability to generate that groove very much depends upon the way we play the notes and their sound, as well as the notes we choose and when we play them. Figure 1 breaks down the bandwidth we hear into nine roughly one-octave-wide segments and then affixes descriptions to the sound that frequency band contributes to that instrument.

Before you start assuming that this is all about EQ, let me be clear – it isn't all about EQ. In fact, most of the time it isn't about EQ at all! How you play the instrument and the character of the instrument determine where the energy distribution lies and when it happens. Also note that this is all approximate and different amps will voice their EQ differently – the EQ descriptions on here are closer to those found on a vocal stage or studio desk, while those found on a bass amp will often be voiced a little lower, so the EQ centres around the bottom of each of these bands.

Working With The Kick

The most important part of the bass guitar's rhythmic function is in providing a pitched thump which is often in synchrony with the kick drum – this function is heard in everything from palm-muted picked chugging metal riffs, through fingerstyle dancing funk which lands heavily on the one, to walking lines when playing bebop on upright bass. The 30–60Hz realm is the seriously low bass, and unless you're using a very big rig but not playing that loud or using a fairly unique cab, then you're not going to have much of that in your sound. Despite hi-fi magazine reviews often talking about 'fast bass', there isn't really such a thing – yes, the transients of low notes can be fast or slow, but those transients aren't actually low frequencies. So neither the kick drum nor the bass guitar's propulsive bottom push comes from this region.

Sympathetic Tonal Choices

If two instruments are playing at the same time and in the same frequency range, then the convention when mixing is to try to separate them by subtly shifting their energy

Figure 1 – Frequency Bands and Related Tonalities

Frequency Range	EQ	Kick drum	Snare drum	Hi-hat	Bass guitar
30–60Hz	Low bass	Sub/depth	N/A	N/A	Size/depth
60–120Hz	Mid bass	Thump	N/A	N/A	Thump
120–250Hz	High bass	Boom	Bottom	N/A	Boom
250–500Hz	Low mids	Pitch	Fullness	Clang	Fullness/punch
500–1000Hz	Mid mids	Pitch	Punch	Clang/colour	Honk/growl
1–2kHz	High mids	Pitch	Resonance	Colour	Growl/grind
2–5kHz	Low treble	Slap	Bite	Edge	Bite
5–10kHz	Mid treble	Click	Crack	Brightness	Brightness
10–20kHz	High treble	N/A	Air	Air	Air

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balance. You'll notice when you hear a good drummer and bassist grooving together that they'll intuitively adjust their sound to hook up with each other. In a Motown context, the bass guitar will tend to sit below the kick, while in a typical rock band the bass guitar's bottom will sit in a similar place yet the kick will shift lower but have more slap and click to define it. When playing reggae the kick tends to sit somewhere around the vintage soul region but the bass guitar comes in lower, while when playing driving busy funk or disco with lots of 16ths the kick sits in a similar position to reggae but the bass guitar's bottom happens higher up above the kick.

Note that this isn't about what notes you're choosing to play – a lot of deep-sounding reggae lines happen higher up the neck than growly bright disco basslines – and often it isn't about EQ either. It's about how the drummer tunes, damps and mics the kick and how the bassist plays and what the pickup settings are – sometimes the bass rig gets involved, sometimes it doesn't. By moving about sympathetically you can share out the relatively small piece of low-frequency real estate that is the 60–120Hz band. However, if other musicians start invading this territory (guitarists with scooped EQ and sealed – or worse, ported! – 4x12" cabs, and keyboardists who are too used to playing solo, I'm looking at you!), the bottom can get sonically cluttered very quickly.

Timing Is When Notes Start *and* When They STOP

A kick drum naturally has lots of thump – even left undamped the note decays quickly because the large skins couple effectively with the air, so there's a quick transfer of energy from the resonant system into the atmosphere, and once that energy has all been transferred, then no more sound comes out. A double bass also has rather a lot of thump – in its case the body couples with the air and takes energy out of the string to generate sound. It isn't as efficient an acoustic instrument as a kick drum (a large undamped example of which can produce 25W of acoustic output if you really stomp on the pedal), with a good double bass producing less than 0.2W acoustically when played as loud as possible. For reference, a boutique 4x10" is about 6% efficient, so when pushed to the limit (300W at best due to the excursion limited power handling) you can get about 18W of acoustic output (despite such cabs being rated at 1000W, thermal power handling and incorrect marketing blurb claiming 1000W power output …).

Anyway, the point we've diverged from is that bass guitars really sustain – even with old strings, a high action and a heavy attack those notes hang around for a while. That sustain can totally kill a groove by removing the pulse that's outlined by the thump of the notes and the quiet moments in between. Every bass guitar has its own distinct note envelope, but that envelope is affected by the strings, how old they are (the dirtier the strings, the more self-damping they have), and then by how you play the bass.

Boom Is (Usually) Bad

One thing that can be a real nightmare with live bass guitar is that at high SPL the non-linearity of many cabs causes poor transient response, particularly in the high bass 'boom' area, and the room boundaries will often reflect this region better than any other, causing further overhang. Why is this? Well, that'll have to wait until next month, but until then remember that the best tools for fixing this problem are right in front of you – your left and your right hand. Even if you play the same bassline on a certain song at every gig, you don't have to play it the same way – encounter a boomy room and embrace your staccato side!