

5 References For Low End

...and why they're so useful!

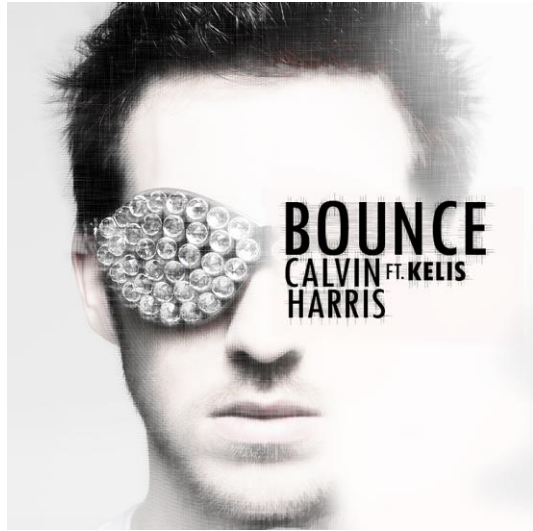
When it comes to mixing in a small studio, it's the low end that really sorts the sheep from the goats. I hear plenty of project-studio mixes with great vocals, impressive guitars, and slamming snares, but seldom do I encounter one that really knocks my socks off in the bass spectrum.

So how can you make sure your mixes are really delivering there? Well, the most powerful tool at your disposal is reference tracks — in other words, commercial releases that you can use as concrete benchmarks for objective comparison. However, in the bass realm, references actually fulfil three separate, but crucially important, requirements:

- They help you evaluate and refine your monitoring setup so that you get the maximum usable information about your mix.
- They provide context for your low-end mixing decisions, so you can be confident that your work will stand up well against other tracks on the market.
- They present paragons of excellence that continually challenge you to push your own mixing skills to the limit.

Now, much of the value of mix references derives from the actual process of going through lots of different productions and selecting those which speak most directly to you, your influences, your mix preferences, and the styles you most gravitate towards. However, because I've written so much about this process in my book [Mixing Secrets For The Small Studio](#), and have also critiqued more than 500 commercial productions for [The Mix Review](#), I often get asked for specific recommendations. So in this short e-book I'd like to share five tracks I find particularly useful for low end, as well as explaining why and how I use them to improve my mixes.

Calvin Harris feat. Kelis: 'Bounce'



A lot of kick drums have a sense of power in some frequency ranges, but not in others. So, for instance, it's not uncommon to hear a percussive upper midrange 'point' being over-emphasised to disguise a soggy, bloated low end. In other cases, you might have well-controlled lows, but no oomph in the lower mids to translate the kick sound onto smaller systems. Or it might just be that the attack in different frequency ranges doesn't feel properly time-aligned, so that the drum always seems somehow less punchy than the competition.

But then there's this Calvin Harris track, where all the kick-drum frequencies arrive at exactly the right time, making the attack super-punchy and allowing it to cut effortlessly through the mix without relying on some kind of spitty Eurodance 'click'. There's plenty of low-end welly in there as well, around 50Hz or so, but below that it tails off, which is sensible given that super low-end kick components can easily make uptempo productions like this appear to drag.

That low-end space left by the kick also leaves ample room for the bass line's fundamental frequencies to grumble along underneath without too much interference, ensuring an impressive display of low-spectrum extension without sacrificing rhythmic definition. But even though the bass line feels very warm and LF-heavy, in reality it has enough well-controlled midrange components that the line translates beautifully onto small playback systems as well — and this mix translation is further helped by flawless lower-spectrum mono compatibility.

[Listen here...](#)

Christine & The Queens: 'Christine'

Creating hardware that faithfully reproduces bass is very challenging from an engineering perspective, and even decent speakers can easily be hamstrung by resonances in your studio room. So one big way you can improve your small-studio mixes is by choosing the right monitoring system and working out how to arrange your room to get the best out of it. And the value of this Christine & The Queens reference in that respect is not what it tells you about your mix — but what it reveals about your monitoring.



The reason it's so useful is that it's tremendously detailed at the low end, compared with more mainstream records that deliberately simplify the low end to maximise punch and clarity. There are sustained sub-bass layers, a reverse-envelope synth, a rhythmic sequence, and at least two separate kick layers (one tight, the other more sustained). It takes a listening system with serious resolution to keep all those components distinct from each other, and to identify the respective balances within and between the 20-40Hz, 40-80Hz, and 80-160Hz octaves. And, of course, the mix's general LF extension will also quickly demonstrate how low your monitoring actually goes.

But there's more. However, much bass your speaker puts out, it's vital for mixing that it can also transmit fast level changes at the low end. If a low-frequency component starts or stops abruptly, then you want the speaker to match that, rather than taking its own sweet time. This is especially important with 'Christine', where there's a lot of variation in envelope characteristics between the different low-frequency layers (some of which have a very short decay). A lot of budget monitoring setups just don't have sufficiently tight time-domain control to bring out all those internal

details, and just render everything as a more or less sludgy blur. So that makes this track something of an acid test: the more detail a speaker system can reveal in 'Christine', the more useful it'll typically be for mixing purposes.

Incidentally, there are a variety of different versions of this track available, and it's the 2014 French-language release you need to look for. The later 2015 English-language version (titled 'Tilted') seems to have been at least partially remixed and doesn't have quite the same degree of low-end detail or spectral extension.

[Listen here...](#)

Post Malone: 'Circles'



Having a bassy track is all very well, but most listeners don't actually hear true bass very often, because mass-market hardware tends to be built to a price, and it's more expensive to produce lows than highs. So if the bass and kick drum are important to your music, then you've got to make sure they don't just have loads of low end, but also enough impact on the rest of the spectrum so that they carry over to mainstream listeners. Which is where this mix reference scores really strongly.

The kick-drum has terrific small-speaker translation by virtue of a strong 200-300Hz emphasis and plenty of noisy midrange ambience. Pushing a kick drum's low-midrange region is frequently the last thing you want to do in a lot of mixes where bass, keyboard, and electric-guitar parts are all vying for a share of the warmth there, because it can be a recipe for overall muddiness. In this case, though, the kick drum's energy is actually rather

restrained below 200Hz, and the low midrange itself is very tightly controlled in the time domain, mitigating any sense of bloat.

The bass line is quite similar to the kick in that it has loads of midrange character and not much true low end. But there's also a sub-bass layer rumbling around beneath it, subtly defining the low extreme of the mix so that it feels like there's more sub-100Hz energy going on than there really is. (And if your speakers are good enough, you might also notice that this sub-bass component is a little unusual too, because it's actually a separate sub-octave synth, and doesn't always precisely track the main bass line in terms of timing and pitch register.)

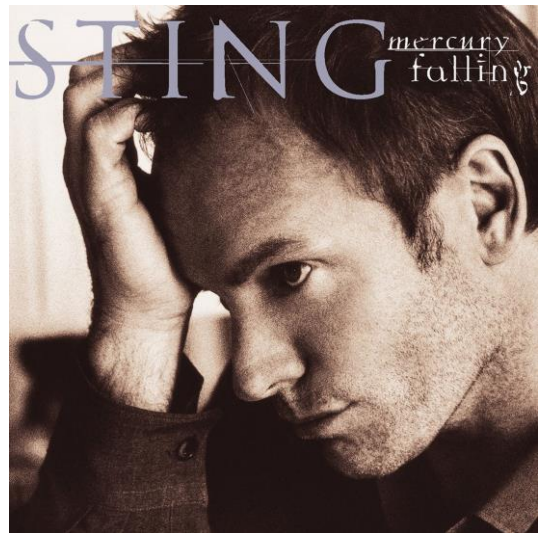
So the upshot of all this is that if you switch between full-range and bandwidth-restricted playback systems, the subjective balance between the kick and bass and the rest of the arrangement remains remarkably consistent — which is basically what mix translation is all about!

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Sting: 'All Four Seasons'

I think a reference collection should be a living resource — in other words, something that you continuously develop over the years to reflect changing musical/sonic fashions and your own professional growth. I've been adding new reference tracks and weeding out older ones for my

own use ever since I seriously started working with references more than 20 years ago, and only very few have stayed the course since the beginning. There is one track, though, that I can't ever



imagine being without, and that's this lesser-known Sting number, from the album *Mercury Falling*.

And the biggest reason for this is that I quickly discovered it to be excellent for demonstration purposes, because the bass-guitar balancing is masterful. On the one hand, the line is wide-ranging enough (fundamentals covering a whole octave from 80Hz down to 40Hz) that it's pretty revealing of low-end shortcomings in project-studio speakers and acoustics. Basically, if the line sounds uneven, then it's not the mix's problem! In addition, though, the song's very good for illustrating mono-compatibility, mix translation, and the importance of midrange energy for kick and bass sounds in general — it continues to impress me how great this record sounds over pretty much any playback system, big or small.

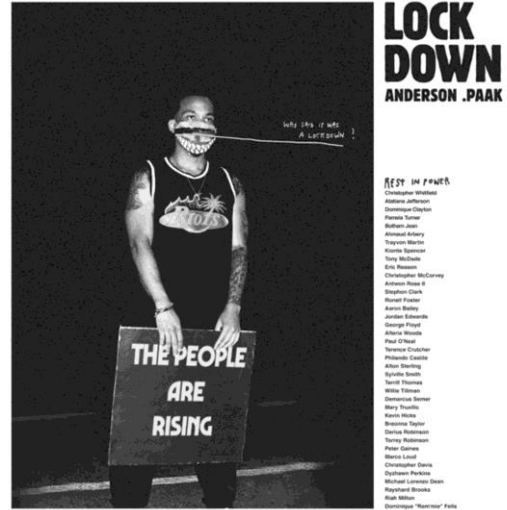
As a result of all that, I've ended up using it for masses of workshops, seminars, studio visits, training sessions, and so on, and it's also been a 'guinea pig' for many recording and processing tests I've done over the years. All of which means that I've heard it on literally thousands of different playback systems in all sorts of different acoustic environments, which now makes it more useful than probably any other track I know when it comes to quickly assessing the low-end character of new monitoring environments I encounter. If I have to walk into an unfamiliar studio and start work straight away, a brief blast of this track immediately gives me a broad-brush idea of how the monitors are responding, and helps avoid any serious engineering misjudgements on my part.

So although this track is a great reference on its own terms, it's also a reminder that the power of any reference isn't simply something intrinsic — it's something that you actively build up over time as you choose to use and reuse that track over time.

[Listen here...](#)

Anderson Paak: 'Lockdown'

While there's a place for hard-edged kick and bass sounds, there are also times when you're looking for something smoother and more laid back, but while retaining a strong sense of warmth and power. This can be a very difficult combination to achieve, so it's great to have a song like 'Lockdown' as a benchmark here.



The kick drum has characteristics strongly reminiscent of a past favourite reference of mine, Dr Dre's album [2001](#), in that there's powerful low-midrange punch that translates beautifully onto smaller speakers, as well as plenty of 50-80Hz power, and yet there's also ample space earmarked in both the time and frequency domains for the powerful, warm-sounding bass part. That said, the low-end power of that Dr Dre album is now a little out of touch with modern, more sub-heavy records, whereas 'Lockdown' is bang up to date for me in this respect, and the extra low end afforded to the kick drum also makes it somehow more able to stand on its own at the low end, where on *2001* its subjective weight is partially an illusion maintained by its combination with bass line.

(It's also worth pointing out that, as much as you might think these drums are programmed, close examination of the waveforms suggests that there's actually a live performance.)

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Building A Reference Collection

I hope this collection of references is as useful for you as it is for me, but of course the most important thing with building a reference collection is that it should match *your* tastes, not mine, so don't feel bad about discarding my selections if you find things you like better! That said, if you'd like more of my suggestions for reference tracks, do check out the Reference Of The Week posts I've been doing for my Cambridge-MT site patrons. You can read the first two in the series here:

[Finlay Quaye: 'Even After All'](#)

[Outkast: 'Bowtie'](#)

There are plenty of other patron rewards too, including regular monthly mixing podcasts and weekly tutorial video content. For a full list, check out this page:

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Thanks for reading!

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