Mixing
DI Bass
Guitar

Ever had trouble getting a plain DI'd bass guitar to sound right in a mix? Me too, sometimes! But it's almost always fixable once you understand the issues.

DAVE LOCKWOOD

Getting the bottom end right is often the difference between a polished, professional-sounding mix and something that never quite realises its full potential, and that usually means both capturing and mixing a good bass guitar sound. On occasion, a clean, unadorned DI bass guitar sound is exactly what's wanted in a mix. But even when the sound of a miked speaker is the preferred sonic outcome, many people still choose initially to record a 'clean' signal by connecting the bass guitar to a DI box or the high-impedance instrument input on their audio interface, since it's often just the most pragmatic option.

Using a DI allows low-volume or even silent monitoring, of course, but also removes the acoustics of the room as a consideration. That's often helpful because bass amps and their associated speaker cabs aren't the easiest things to record with mics, especially in smaller rooms where unpredictable cancellations can occur due to interactions between room boundaries and the long wavelengths involved. Furthermore, a clean DI track offers up the widest range of options for modifying the sound when mixing.

A lot of recording musicians, though, seem to struggle to get a DI'd bass part to sound right when it is in a mix. So, in this article, I'll be explaining what it is about a clean DI'd bass sound that can make it challenging, and I'll take you through some techniques that should help you get closer to the kind of result you may be seeking in your productions. Whilst there are some very capable amp-modellers, speaker IRs and clever bass-enhancement plug-ins available, you won't need them for this. I'm going to be employing only basic plug-ins such as the EQs and compressors available in any DAW, alongside some simple editing and routing strategies.

I'll assume that you already have a project with a single, mono track of DI-recorded bass guitar, and monitor speakers or headphones that allow you to hear a satisfying amount of bass when you listen to commercial mixes. If you're unsure about the accuracy of your monitoring, try importing some good-sounding commercial tracks into your DAW, install an EQ set to flat in all

Figure 1: Typical frequency response of a single 1x15 bass speaker cabinet.

Figure 2: Typical frequency response of a single 4x10 bass speaker cabinet.

Figure 3: The averaged spectral balance of a clean DI'd Fender Precision bass guitar.

bands but with the spectrum display active, and examine the overall frequency shape of the audio. Note particularly where and how steeply the bottom end rolls off, and then see how some of your own mixes compare. Try to achieve a broadly similar shape of roll-off, and you shouldn't end up too far wrong. If in doubt, err on the side of caution:

too much deep bass is always more destructive in a mix than too little.

DI-agnosis

First, let's consider the problem we're trying to overcome. If you use a good amp/ cab simulator pedal or a bass-specific DI pedal with EQ and dynamics at the recording stage and, crucially, get all

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Setting Up A Bass Guitar For Recording

There isn't really a one-size-fits-all recipe for setting up a bass for recording. Some people suggest that you should tweak the action up to make sure there's no fret rattle, but far more important to me is that the player should be playing a bass with an action that they're used to and comfortable with. Don't adjust a truss rod the day before recording, unless you know exactly what you are trying to correct, and how long it takes your bass to respond to adjustments — some instruments take longer than others.

Accurately adjusted intonation is important, so that the bass will play in tune all over the neck, and it helps if all the strings are the same age! It doesn't really matter what that age is, as long as it's appropriate to the tone you want — old strings on a bass is very much a tonal option — but it doesn't help if one string is much brighter than the rest! Make sure that the jack socket isn't loose and prone to crackling, and if the bass has a single-coil pickup (Fender Jazz bass, early Telecaster bass etc), be sure to position yourself away from any

sources of induced hum, which really can ruin a bass recording. Split-pickup Precision basses and anything with a similar configuration are inherently humbucking, and on a Fender Jazz bass you can turn both pickups fully on to achieve hum cancellation — but you might not like the tone anymore!

With an active bass, install a fresh battery, as onboard preamps can start to clip on loud low notes when the battery is getting depleted. Avoiding too radical settings with onboard active EQ on the bass itself also helps, as this can be quite hard to undo, before you even start shaping the tone for the mix.

Some people see an advantage to using short-scale basses for recording. They certainly have an inherently tighter bottom end, but I don't think the gain is worth dealing with the unfamiliarity, unless that's what you play all the time.

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the settings just right, you may not have a problem at all, but a plain DI track on its own can often seem a bit bland and incomplete-sounding, especially in a busy, or up-tempo mix. This is because electric bass guitars were originally designed to be used with amps and speakers, and without those components the spectrum DI'd straight off the pickup simply isn't what we're accustomed to hearing. Typically, there's far too much midrange and the bass end doesn't have enough of the 'thump' and resonance needed for a contemporary mix.

If you compare the averaged spectrum plots for two types of bass amp and speaker combinations (Figures 1 and 2) with the plot from a Fender Precision bass captured using just a clean DI box (Figure 3), you can, literally, see the problem. In the 1x15 speaker plot, the 500Hz midrange area is more than 15dB below the peak in the bass area that sits around 150Hz, whereas for the DI signal that difference is more like 5-6 dB. In the 4x10 plot, the difference is even greater (over 20dB). Fortunately, electric bass guitar has no 'natural' acoustic sound for our ears to reference, so we can get pretty radical with EQ and dynamics processing to 'bend' it into the kind of shape that best meets the needs of our mixes.

Another reason why mixing bass, and especially DI'd electric bass guitar, is perhaps more of an issue now than in the past is that expectations have changed significantly in recent decades. Listen

to popular, commercially successful recordings from the late 1960s, through the '70s and into the '80s, and you'll often hear the bass end come and go a bit, according to which range the bass is playing in. In contrast, the bass in modern recordings in almost any genre, and particularly the amount of deep bass, is far more consistent and ever-present, and mixes in which the bass doesn't permanently underpin the harmonic and rhythmic shape of the track just don't seem to sound professional any more!

So we have two broad issues to address: one of fundamental tonality, and the other the consistency of the bass part in the mix. Of course, in discussing this issue at all it has to be accepted that a wide range of different outcomes might be sought — the sound of an effective bass line can vary massively, from the no-treble depths of a reggae bass part to the clanking grind of classic punk rock. Still, it's almost certainly the case that the musical *role* of the bass will be the same whatever the context: meshing with the drums to provide the rhythmic pulse of the track, whilst also underpinning the harmonic structure of the chords and top lines.

Key Pointers

With all that in mind, then, let's consider how you might best approach mixing DI'd bass guitar. There are so many variables in play (different genres, different basses, different playing styles), so nothing can

be absolutely guaranteed to work for every situation, but let's start with some tips that are as close to being universally applicable as it gets:

- Always mix bass in context. By all means solo the part to search for fluffed notes or noises, but tone and volume must be decided alongside the other instrumentation; what it sounds like on its own is irrelevant.
- Because the perceived bass level can vary significantly with playback volume, it helps to maintain a consistent monitoring level.
- When equalising in the lower octaves, try to use only wide-band EQ (unless you're addressing a specific resonant peak or dead spot), as narrow-band cuts or boosts can start to affect individual note levels rather than tonality at very low frequencies.
- To fix uneven playing, opt for edits rather than compression — if a compressor is correcting the performance, then it can't do what you really need it to.
- If other parts are competing with the bass guitar in the lower mids, the bass has to 'win'. So be prepared to carve frequency space out of other instruments.
- Sometimes, when a bass track isn't working, it's not the fault of the sound at all. Rather, it's the playing or the part that's wrong, and you really won't be able to 'fix it in the mix'.

You'll probably have noticed that my list doesn't include the 'old favourite' tip of making sure that your bass guitar and kick drum address different areas of the low-end spectrum. Certainly, if you're going to dial in a significant low-frequency peak for both signals you'll want those peaks to be in different places. But how about just not creating the problem in the first place? Better, in my view, to shoot for a smoothly extended bass-guitar signal that can co-exist happily with the lower peak of the kick drum, wherever you need to place it.

On a similar note, if you've consumed enough 'Internet advice' on this subject you might imagine that you can't start mixing a bass-guitar track without setting up 'ducking' from the kick. But you need a reason to use ducking. Four-to-the-bar kicks combined with a hard-quantised, fat, synth bass sound in a high-bpm track can be cleaned up with a bit of ducking, and side-chain compression can be used as a deliberate effect too. But a properly EQ'd bass guitar really should be able to coexist with the kick, with neither having to push the other out of the way; moments of 'useful summing' are retained as part of the natural dynamics of the performance.

Get The Bass-ics Right

A good bass sound in your mix starts with a good bass sound, which requires a good bass — one that's reasonably even in output both across its strings and up and down the neck. Many basses have hot spots and may have dead spots

■ James Jamerson, *the* Motown bass genius, was always DI'd, but his sound is primarily the result of the old, very dead, flatwound strings he favoured and the foam-rubber string mute built into the bridge cover of his Precision bass. Combine that with his technique of playing every note with a single right-hand finger just beyond the big chrome pickup cover, and you have a warm, consistent sound not really typical of a DI at all.

too. So what constitutes 'reasonably' even? Something like a general lack of resonance towards the bottom of a low-E string, and especially a low-B on a five-string, can be dealt with pretty easily. But, for example, a low F-sharp that just dies on you will be problematic.
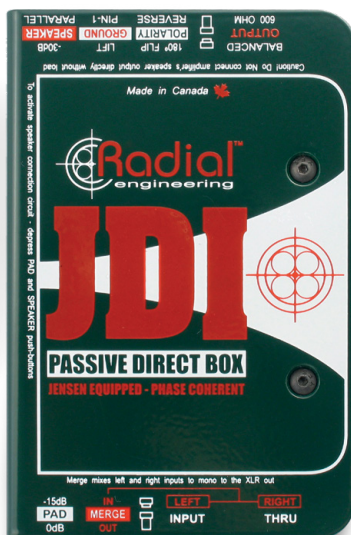
Good players don't only learn the idiosyncrasies of their instruments: they'll also learn how to voice a part for recording too. If you're playing a riff that consistently involves the E at the seventh »

DI Boxes: Passive Or Active?

If using an 'active' bass (one with an onboard preamp that requires a battery), you can use almost any sort of DI box, but they vary, mostly in the amount of lows you can get without the box distorting, especially if you start cranking the bass band of an active EQ. A traditional 'passive' bass, like a Fender Precision, will always benefit from using an active DI box (one that needs a battery or phantom power), preferably one with an input impedance of at least 500kΩ.

A passive bass into a passive DI will still work, but you'll get a bit less signal and an attenuated top end that will limit your options when mixing. In general, it makes sense to max out the volume control on a passive bass when recording, but if you happen to want something a bit softer, perhaps with a P-bass into a 1MΩ input impedance DI box, backing off the volume control a little will quite subtly take away a bit of edge.

There are loads of passive and active DI boxes to choose from. An active bass can use either, but a traditional passive bass will tend to benefit from an active DI.

fret of the A string, it doesn't help if some of those notes are played using the E at the second fret of the D string instead. It might work fine on stage, but that sort of tonality change is really noticeable on repeated listening, particularly under the microscope of recording and mastering processes. Even on a really good instrument, the general change of tonality between the E and A strings versus the thinner D and G is something worth bearing in mind when preparing a bass

Reference Tracks

Many people like to use reference tracks when mixing. Personally, I think there is little point in setting up instant A/B switching between your mix and the reference — the comparison is only valid, especially at the bottom end, if you add some temporary mastering processes to your own mix, and manage to match the subjective loudness quite accurately. What does help sometimes, though, is to listen to a few well-recorded commercial tracks just before starting the final stages of a mix, getting a feel for the relationship between the elements in the track, rather than their absolute levels. That seems to be something we can retain in memory and apply rather more usefully over a period of time, compared with the 'difference' information of the short-term A/B check.
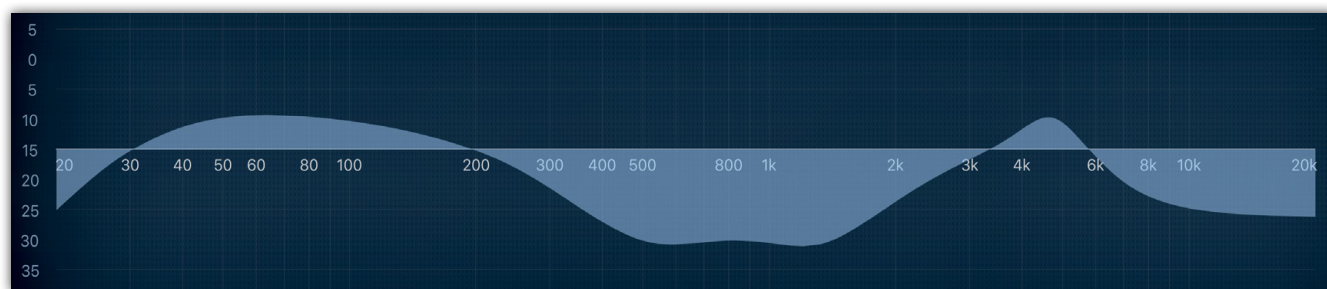
part for recording. I'm sure I'm not the only engineer to have edit-replaced all the notes played in the 'wrong' part of the neck for more consistent-sounding ones from other parts of the track!

There's a similar consideration with regard to the (right-handed) bass player's right hand, which applies equally whether they play with fingers or a pick. Notes played just in front of the bridge have a very different attack and tonality to the much rounder tones found by picking nearer the end of the neck. There are valid reasons why you might want to switch from one to another during a track but, in general, it's not helpful if you want to achieve a consistent bottom end in a mix.

The avoidance of any of the above issues goes a long way towards simplifying the task of addressing the tonal issues that we'll move onto in a moment. Before you start trying to mix, though, do try to get the track tidied up with a bit of DAW editing. Any notes that are obviously too loud or quiet can be isolated into individual regions and have their gain tweaked to make them more even in level. Don't leave this job to a compressor, since it can be done better with editing. If the levels are way off, then the tonality and envelope

might sound different enough to warrant substituting a note in from another take or another point in the performance. It's also worth muting any significant gaps in the bass track — even if you can't hear anything, there will often be noises that could become evident later, such as when applying some mix bus compression.

Remedial EQ & HPF

I like to start shaping the sound of a DI'd bass with what I call 'remedial EQ'. Figure 4 is a frequency plot showing the difference between a DI'd passive bass signal and the average of two speaker cabs. This gives us a broad target for EQ that should counter some of the issues I described above. We can add or subtract from such a curve later, for tonal reasons, but this almost always gets me into the right area to start with. (At this zoomed-out level, different basses don't change the outcome much so can be ignored as a variable; even a five-string instrument seems to benefit from this treatment.)

There are several ways of arriving at something like the overall target response shape, but a standard DAW EQ plug-in does the job perfectly well. It's important to note that, while you're lifting the bass region, you should avoid creating a prominent peak there. You

» want a smooth rise and fall. Also, because you're boosting where there's lots of energy it pays to work at 'safe' levels that leave you plenty of headroom. Don't start this process with a bass track already peaking near 0dBFS!

I suggested above that EQ'ing should normally be carried out whilst listening to the spectrum of the mix as a whole, but you can start getting rid of any spurious very low frequencies in solo mode. Even inaudible LF energy consumes headroom and can mess with any compression you apply. The fundamental of the bottom E on a four-string bass is 41Hz so, theoretically, there shouldn't be anything lower than that — but there often is! So slope it off with a 30Hz high-pass filter (HPF) at 12 or 18 dB per octave.

EQ In Context

With your HPF applied, it's time to start listening to the part in context (ie. not soloed). We're not starting an actual mix here, but you need to create a rough balance in which nothing is dynamic enough to be distracting. So I recommend creating a static-fader balance that

lets you hear the general spectrum of the mix. If you have individual drums on separate tracks, route them all to a stereo sub-group and put a 2:1 compressor on the bus, registering an average of 2 to 3 dB of gain reduction. Bus together keys and guitars (and any other instrument that isn't bass), and add a similar 2:1 comp. Route all vocals to their own, similarly compressed bus, too.

Set up a playback loop on a section of the track where the bass is playing something reasonably representative of the part as a whole, and find a level for it that allows you to hear it consistently without it being too dominant. I start my bass EQ'ing by cutting a big chunk out of the midrange, perhaps as much as -8dB around 500Hz, with a Q of 0.2. (That might seem like a lot, and we may put some of it back later, but it helps to be that radical at this stage.) Let's also push the real highs back, too, with a -3dB shelving band from about 3kHz upwards.

You should still be able to hear the bass part, but it will now probably seem gutless and uninteresting, so next, we'll achieve the 'bass bump' bit of the shape that represents the cabinet's weight and resonance. Remember, we want to avoid a narrow-band boost, so I prefer to use a Q of around 0.3, lifting by about 4dB, centred on somewhere between 100 and 120 Hz. This should combine with the mid cut to produce a similar relationship between the lows and mids as in the speaker-cab plots, but it will always require further fine-tuning in context.

Now we have three key parameters to play with: the 100-ish Hz lift, the 30Hz high-pass and the 500Hz midrange cut. Re-balance the bass with the rest of the track if you need to, so that it's about the level you think you might want to hear it in a final mix. The optimum values will depend on the instrumentation of the track and the desired bass sound, but as a general rule when tweaking try slowly moving the 100Hz band between about 90 and

150 Hz, to see if there's a point at which the bass part just seems to come into focus more. You might notice that you can now hear bits that were previously being a bit lost, for example. If you find a point where any of that happens, that's where the heart of the bass sound needs to live — for this bass, in this track, in this key. Changing any of those variables will change the outcome!

If none of that feels like it is working at all, then you may have some serious frequency masking going on. So try applying a high-pass filter, set to 50Hz, to your instruments subgroup. Play the track again and slowly sweep this high-pass frequency upwards until the bass part becomes more clearly and consistently audible. At some point, that's guaranteed to happen. You will, of course, have detrimentally affected the sound of some of the other instruments in the process, so take that high-pass off the Instrument bus, and start applying the same kind of filter, one track at a time, to the individual instruments, initially soloed and then in the context of the mix. You'll find you can high-pass some of them quite drastically without actually changing their musical contribution, and others less so.

If the bass is sitting more comfortably now, you may want to revisit the midrange cut. Sometimes this won't need to be as deep as in the Figure 4 'target' response but it often benefits from being wider. Try adding a second band an octave above the first, centred on 1kHz and attenuating by about 4dB. Most DAW EQs have enough bands for this, but if not you can use two instances in series; it doesn't have a detrimental effect on the sound. Remember, the curve in the display is the shape of the EQ settings, whereas what we're really interested in is the shape of the signal after processing. So it's the real-time analyser display that we want to look something like the shape in Figure 1 or 2, not the EQ settings response. (If using
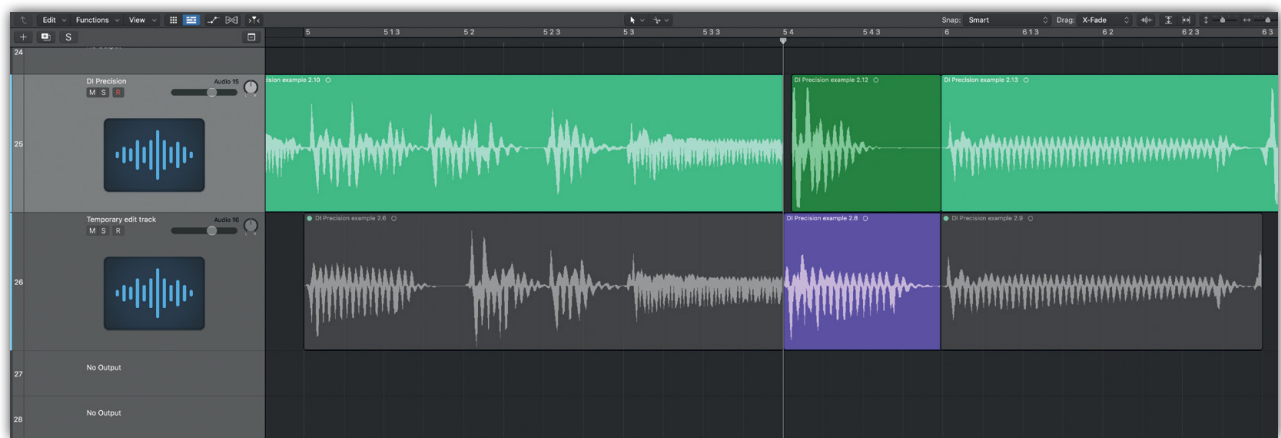
Fix It With An Edit!

A healthy dose of parallel compression can lift any slightly under-played notes, of course, but as I said in my bullet-point list, it's much better to fix these with editing. A fluffed note made louder by a parallel compressor is still a fluffed note, and these have a nasty habit of sounding fine until the last bit of finessing of your mix-bus dynamics, when they suddenly stand out like a sore thumb. Fix anything that's wrong in the bass line with an edit: it's so easy to do in your DAW. Everyone will have their own preferred method, but mine is to temporarily create a duplicate of my bass track, make a cut at either end of a large logical section, like a verse or chorus, where the wanted 'good' note appears, and shunt it along to sit underneath and in time with the area to

Figure 7: It's always best to try to fix any obvious performance problems with simple edits than to rely on compression to cover them up.

be fixed. This is easy with anything played to a fixed tempo, but for anything 'unclicked', you just have to narrow the time window a little to find a section that will stay in sync for long enough. The purpose of doing it this way is that notes that are under-played are often slightly out of time as well, and by lining up the pattern in the waveforms, you are able to see exactly where the 'fix' note should really be placed. Chop it out from the good track and replace the fluffed note in the track above, with a tiny crossfade clear of the attack of the edited note and the start of the following note.

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two EQs, be sure to consult the analyser in the second instance!)

Now to restore a bit of articulation. You can do this with a peaking EQ, perhaps +3dB at 4 or 5 kHz with a Q of 0.70, looking to add just enough to make the front end of notes more discernible but without altering the overall tonality. If you want the bass to be more prominent, there's another, perhaps better approach. I often create a 'super-highs' track, using an aux send from the channel to feed an exciter. (For this to work, your DAW must have automatic plug-in delay compensation for aux busses and it must be switched on.) Set the exciter to output 'processed-signal-only', creating 10 or 12 dB of harmonics above 2 or 3 kHz, according to how much top end there was in the original bass signal. We can use this to really bring the bass line forward or, very sparingly, to add a kind of gloss to the final bass mix, without making it subjectively much brighter. As a dynamic, distortion-based process, it will track the playing dynamics to some extent, perhaps creating a more useful effect than a top-end EQ boost.

Compressor Settings

Now, let's explore a bit of compression to keep the bass more constant in the mix. If you're not confident that you know what you're doing with all the parameters in a plug-in compressor, it's probably safe to choose a bass guitar preset and start by turning the threshold to 0dB, so that the compressor will initially be doing nothing at all. Set the Ratio to 2:1 (we've pre-levelled the track with edits so shouldn't need more) and start to lower the threshold, watching the gain-reduction meter to see where the compressor starts to bite. If you see more than 4 or 5 dB on a regular basis, that's probably too much, and you should raise the threshold a little.

The attack setting effectively determines how much of each note onset gets through before the compressor reduces the gain, and allows you to shape the final sound quite significantly. A slower attack time will emphasise the initial transient, while a fast attack will make everything seem smoother. But set the attack and release too fast and the compressor may generate audible distortion. If you're unsure, start with a compromise attack of 10-20 ms and an auto release. If you want to try a manual release setting, start at about 100ms and listen to the result. The ideal release time, in context, is usually one that has ceased applying any gain reduction
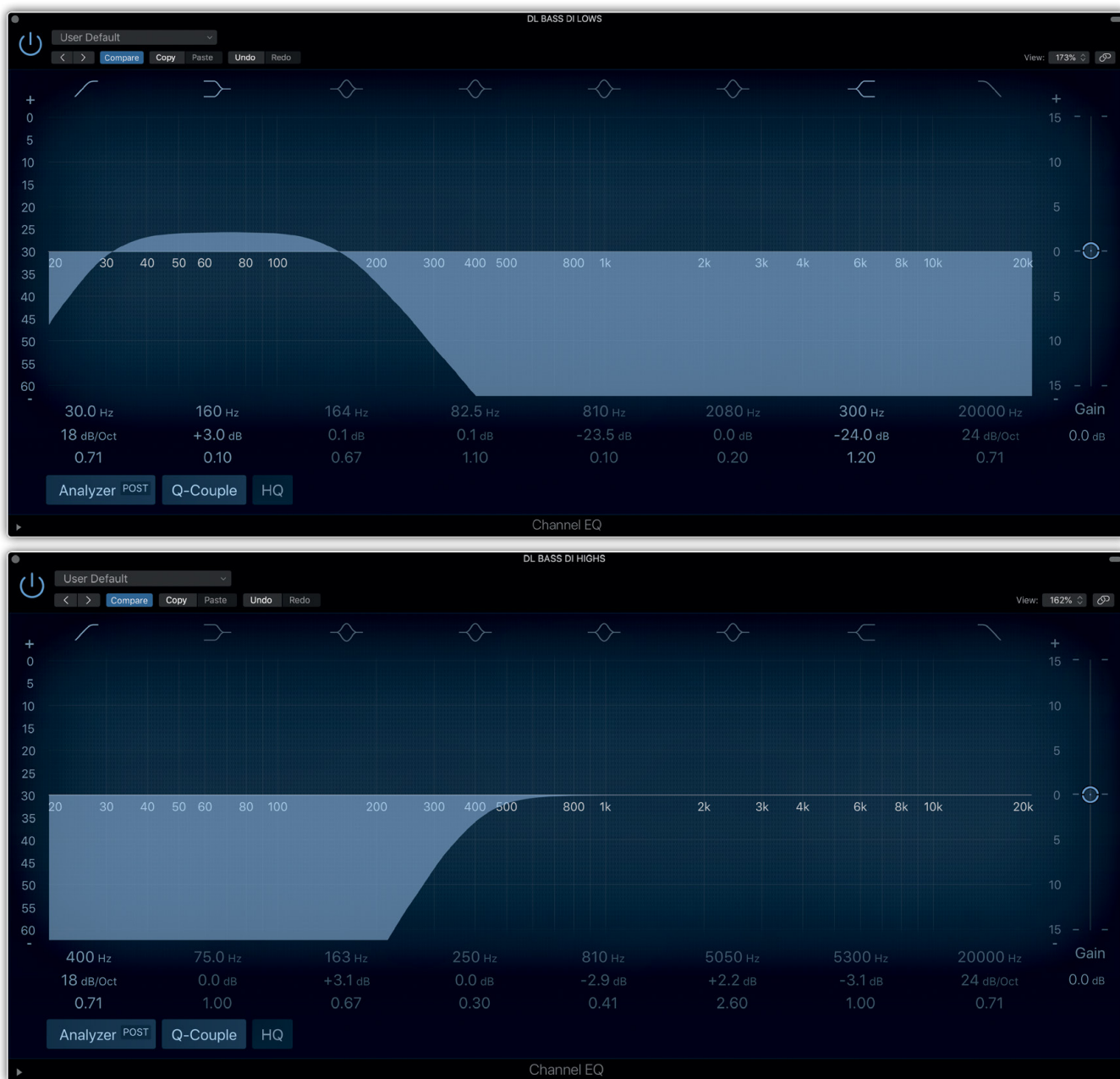
by the time the next note hits in any regularly repeated pattern, as that will maximise loudness. But you also want to avoid any too-obvious alteration of the envelope of the notes (for example, a note may get louder as the compressor releases, when it should be getting slightly quieter as the note sustains).

Some plug-in compressors offer a choice between peak and RMS operation. The former is fast-acting and best suited to controlling transients, but as we're looking for longer-term consistency of level the RMS setting (which looks at a longer time period to determine an average level to respond to) suits our needs better. Don't worry if you can't see this parameter in your plug-in, though; whatever you're using will still do the job!

Parallel Lines

If you feel the bass part needs even more consistency in level, try this. Set up a compressor on an aux send and return it to a bus along with the original signal, so you can control the level of both together once you've found a balance. You need fairly heavy-handed settings (eg. a 6:1 or 8:1 ratio, generating about 10dB of gain reduction) or there's no point in doing it. The parallel

Figures 5 & 6: Create a copy of your bass track and apply the upper EQ to the original track and the lower one to the duplicate to give you independent 'Bass Lows' and 'Bass Highs' channels.

compressor output should be blended in underneath the main signal, having the audible effect of raising the level of quieter elements in the sound, whilst leaving any dynamics in the actual playing largely unchanged; the main track will always dominate on any accented notes. For this sort of parallel compression, fast attack and release times work best — there will already be an audible transient in the main track, and the fast release is what will raise the level of quieter elements the most.

Many plug-in compressors include a mix control, which allows you to create a parallel path by blending the 'dry' uncompressed signal with the processed output. But I much prefer the 'full fat' alternative of sending to a compressor via an aux bus because this makes it easier to find the right level for the parallel-compressed signal and allows you to EQ the parallel path, which I often do before the compressor (to remove some of the very low frequencies) and sometimes after it as well (to address any area of midrange detail that I might want to highlight or de-emphasise). You could, instead, try using the plug-in's mix control and a bit of side-chain EQ, but this

doesn't really give you quite the same flexibility or, I find, such intuitive control.

More Character

If, after all this, the basic tonality is still just a little characterless, you can try adding a small amount of a distortion or overdrive plug-in. I'll only ever use distortion in parallel on bass, so that I can fine-tune the effect easily with EQ and other processing. For example, I like to take out some of the lows (below about 100Hz) before the distortion effect so it doesn't all turn to mush, and take out some of the highs (anything above 2kHz) after the effect so it doesn't get too gritty.

Distortion is, of course, level dependent, so if you want the extra harmonics of the distortion to make a more constant contribution to the sound, you can also install a compressor before the distortion — this way you can push it harder and more consistently (try a 4:1 ratio; 6 to 10 dB gain reduction; and enough makeup gain to ensure that it is at least 3dB louder when switched in). Sometimes, I'll also install a compressor after the post-distortion EQ, just to flatten the dynamics of this source even more. It's often easier to find a distortion balance that works for the duration of the whole track like this, without having to think about using any automation of the distortion contribution. You'd never attempt this sort of profligate serial processing in the hardware world, but there's nothing wrong with doing it with plug-ins! There's no analogue-style 'signal path degradation' to worry about, though it's sometimes tricky keeping track of what every process is doing and why you put it there!

If you feel the part needs yet more 'ear-catching' interest, you can add a bit of movement using a subtle phaser or chorus effect. I like this effect rather more with synth basses than bass guitars, but it works when used subtly. Run the effect in parallel using an aux, again, and take out a lot of the low frequencies from the effect return so as to prevent any destructive interaction with the main signal path. If you use a modulation effect in mono you'll get some tonal 'movement', but you can let this effect be stereo and gain a hint of

Let's Talk About 'Q'

When it comes to bandwidth, or 'Q', sometimes it is more intuitive to think about the value in terms of the octaves spanned rather than specific frequencies, but don't forget the 'expanding octaves' principle: 40Hz to 80Hz is an octave in terms of pitch, but only a frequency difference of 40Hz, whereas 1kHz to 2kHz is also an octave, but a difference of 1000Hz. You may also be aware that some EQs are designed to vary their Q with the amount of attenuation or boost applied (variable Q versus constant Q). It is often a switchable option in plug-ins. If you are using a large amount of cut or boost, as we occasionally are in this exercise, you may prefer constant Q so the bandwidth you've chosen doesn't get altered by the band's gain setting. The table shows you the octave span of different Q values. Putting that into a practical example: if we dial in +3dB at 160Hz with a Q of 0.67, our bell curve returns to 0dB again by 80Hz below the peak, and 320Hz above — a span of two octaves. There really are no 'rules' as to which 'key frequencies' you might want to cut or boost. "Cut between 200 and 350 Hz to eliminate muddiness" might work sometimes, but with a different bass, in a different track, with different instrumentation, that might be exactly where the tonal centre needs to be. Do it by listening and get it right for the bass in your mix not somebody else's!

Q	Octaves
4.36	0.33
2.87	0.5
1.90	0.75
1.41	1.0
0.92	1.5
0.67	2.0
0.51	2.5
0.40	3.0
0.33	3.5

movement in the stereo field, too, while the main bass track will always stay firmly mono and central.

Next Level

Still not hitting hard or staying constant enough for you? OK, then let's take things to the next level of remedy — or perhaps 'creative control' would be a more positive way to look at it. It can help to split the signal into two discrete frequency-band streams that can each be processed separately. This allows us to really pin the bottom end of the track in place, without the mids and top end being unduly affected. Create a duplicate of the bass track, and route both to a Bass Group bus. Name the original track Bass Lows, and the duplicate Bass Highs. You can leave any parallel compression in place, but delete any other sends to parallel processes.

Now to get radical with EQ! Retain the 'bass bump' EQ you dialled in and keep the 30Hz high-pass, but now apply a 24dB/octave low-pass filter at 300Hz — yes, we're obliterating everything that isn't bass or lower mids. In the Bass Highs track we'll do the opposite, deleting any existing EQ and applying a high-pass filter »

Right At Source?

There are lots of different ways to pre-process a DI'd bass, rather than just using a clean DI box, including dedicated bass preamps like Tech 21's VT Bass DI or their venerable Bass Driver DI, Ampeg's SCR-DI, Origin Effects' Bassrig, MXR's M80 and many others. Most digital amp-modelling processors, both hardware and software, now include dedicated bass amps and cabs, and sometimes just applying the impulse response of a miked bass speaker will get you close to what you want. If you have an actual amp with a particularly nice EQ stage, you can often take a DI from the preamp output to get a pre-voiced signal to record directly. All of the above have the benefit of allowing you to hear a more 'finished' sound while recording, at the expense of limiting your flexibility in the mix (unless you record a clean DI at the same time). Pretty much every DI box is pre-configured for this scenario, with a clean output and a split output to go to an amp or processor. Recording all sources to separate tracks will allow for subsequent time-alignment, if necessary.

Should you compress bass when recording? With so much headroom in a 24-bit digital

▬ If you regularly record yourself playing bass, a judiciously set up bass preamp might mean you don't need to work so hard in the mix.

recording, there's no real need to, and I don't personally like to have any compression baked into the signal when doing any subsequent processing. But some players will be more comfortable and play better if they're hearing a degree of compression whilst recording. Again, you can split the signal, allowing the player to monitor only the compressed one, whilst also recording a clean track.

» at 400Hz, with a steep 24dB/octave slope. If you look at the Figure 5 and 6 plots side by side, you'll see exactly what we've done: they don't fully meet, but neither do they create much of a dip. What they do achieve is two very controllable separate elements to the bass sound.

Play the track again (remember, we're making all our bass-mix decisions in context) and mute the new Bass Highs track while you work on the low-pass track. This is the foundation for the eventual overall bass sound, and I like to really nail it in place. Make sure that the parallel compressor is routed to the Bass Group bus and raise its fader until it feels like the deep bottom end never goes away in the mix, even when the bass line is playing higher notes. Even though you've taken away nearly all the top end from the bass line, you should still be able to hear the pitch of individual notes clearly enough for everything to make musical sense. If you can't, you need to revisit the initial EQ stage and maybe move the centre frequency of the bass bump up a little, or take a little more out of the very low end.

Now unmute the Bass Highs track and bring its fader back into the mix until you achieve the overall tonality that you want. Depending on how much the bass line competes with other instrumentation, you should find that you can have as much or as little of this high-pass track as you want without the bass line becoming overbearing, because the bottom end is now separate and should just sit there, doing its job of underpinning everything. It's well worth creating another 'super-highs' feed to an exciter from the Bass Highs track, and blending that in according to how 'forward' you want the bass part to sound.

The distortion and modulation-effect 'sweeteners' described earlier can also be used, often to better effect within this multi-channel setup, since they can be sent solely from the high-pass channel without having to worry about affecting the lows too much.

With a solid bottom end pinned in place, the Highs track level can, of course, be varied throughout the mix to emphasise or de-emphasise the bass part. This doesn't have to be with automation: I often just 'mult' the highs track and set it at one level for intro and verses and a different level for choruses and outro. You can't really fake playing

dynamics with volume automation; a gently-played bass will still sound like that even when it is louder. But you can sometimes usefully automate the 'super-highs' send to make it sound like the bass player has performed their part with a bit more energy in places.

Why Not Use Cabinet IRs?

Exactly how much of each of the sources we've discussed here you might want in your final bass mix is likely to be genre-specific. Most forms of music that might be described as 'rock' tend to want a little more midrange and often a little more distortion in the bass sound. There is a traditional association with amps and speakers in this genre because of their ability to inherently offer more of both of the above. The potential benefits and challenges involved in successfully miking a bass cab is a whole subject on its own and not one to be addressed in a piece specifically on mixing DI'd bass, but as DAW users we can still have access to those sounds via amp modelling and speaker impulse responses.

There are two ways to do this: either install a bass-amp/cab modelling plug-in on your clean DI track, or leave your DI

track untouched and send to an amp/speaker plug-in via an aux send and balance to two sources to taste. Routing both to a common bus allows easy subsequent treatment of the combined signal with further EQ and compression, if necessary.

So why not simply use a speaker impulse response in the first place, rather than muck about with lots of EQ? Well, you can. But first you've got to find the right one. And if you find one that's just right, it might not be just right for the next song, that's in a different key and uses different instrumentation. So you have to search again… A couple of minutes of IR hunting and I tend to find I'm still in the first folder wondering why too much or too little seems to change from one IR to the next! A couple of minutes of listening and tweaking EQ and I can usually find where the bass needs to 'live' in any mix. I'm not dissing speaker IRs here — I often use them for other sources — but for basses I prefer the direct EQ options.

If you do favour using a speaker IR for bass, it's possible that you may also be using a modelled bass amp. There are some flavours of distortion that are unique to certain models of bass amp, and some people find the simpler controls of a (virtual) instrument amp more intuitive for tonal shaping than an EQ plug-in. Again, there's nothing wrong with that: you'll always do a better job working with something that you are familiar and comfortable with.

But what if you want to combine your virtual bass amp and cab IR, with a DI? Well, I'd suggest you use none of the previously-described EQ strategies. In this configuration, you only want the DI to make up for any perceived spectral deficiencies in the amped signal — otherwise you'll just detract from the sonic character that originally made you want to use the model. Instead, try EQ'ing the DI signal with just a -6dB dip centred on about 1kHz, with a Q of 0.3, combined with an 18dB/octave roll-off at 30Hz, and blend the DI signal in under the amp/speaker sound, in the context of the mix. See if it makes things sound better, or more complete. You might find that the clean top end from the DI isn't helpful at all, in which case you can just push that back from about 3kHz upwards with

shelving EQ. Try to find the minimum level at which adding the DI is audible — and if that isn't an improvement, leave it out, as it probably means the track is fine as it is.

Final Thoughts

One thing to bear in mind when mixing, particularly for balancing bass, is the audible effect of any mix bus processing. I like to add my mix bus processes part way through a mix, so I make all my final balance and tonal decisions hearing exactly what the final result will be. If you apply mix bus processing only right at

"If in doubt, err on the side of caution: too much deep bass is always more destructive in a mix than too little."

the end of your mix balancing process, watch out for any dramatic or detrimental changes in the bottom end. Depending on what kind of processes you've got in your mix bus, you may find that the deep bass suddenly seems over-emphasised, or that the bass is now dipping other elements in the mix. If your bus-processing chain is something that you know works well for most mixes, then don't change it, but revisit the bass to see which parts of it are doing the 'damage'. Mix pumping can be a great effect when you intend it: not so much when you don't!

There's one more thing that I find useful as a finishing touch for balancing the bottom end of a track, whatever type of bass instrument I'm dealing with. When you've finished your mix and are entirely happy with everything, route your Bass Group bus fader (the one that brings together everything that makes up your final bass sound) to a new bus

fader instead of the main mix bus and… do something else for five minutes. Preferably in silence. Now pull the newly-created bus fader down to the bottom and run the mix. Push the fader gently up, listening without looking. That last bit is important! You might want a couple of passes at this, especially if there's any automation on the Bass Group bus fader (this is why we route it to a new bus fader).

When you're happy with what you're hearing, look at where you parked the new temporary bus fader. If it's at unity, congratulate yourself on having done a great job with the bottom-end of the mix. There's a very good chance, though, that it will be a dB or so under the unity mark. It often is in my mixes, and I think this just represents the extent to which we start to try to compensate for the effect of hearing a mix over and over again, and needing the excitement of a bit more bass than is actually necessary. The aural 'reset' of suddenly hearing the mix with no bass at all allows us to more easily find the right level for it.

There really is no magic formula that will always work for mixing DI bass guitar. The playing and the part itself are huge variables that are at least as important as the bass sound in determining the success of the bottom end of a mix. But the above techniques can certainly help, used in whole or just in part, so long as they are tweaked and adjusted to the context of your bass sound in your track. Don't expect instant perfection. Mixing is as much art as science, they say, but it is a learned art, I'd contend. Nobody ever got good at mixing without doing a lot of mixing! ▰▰▰

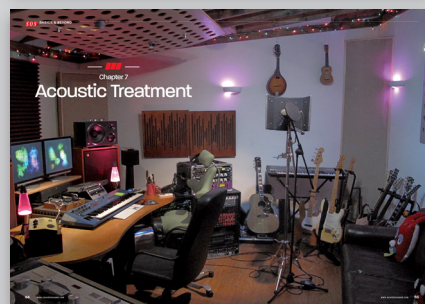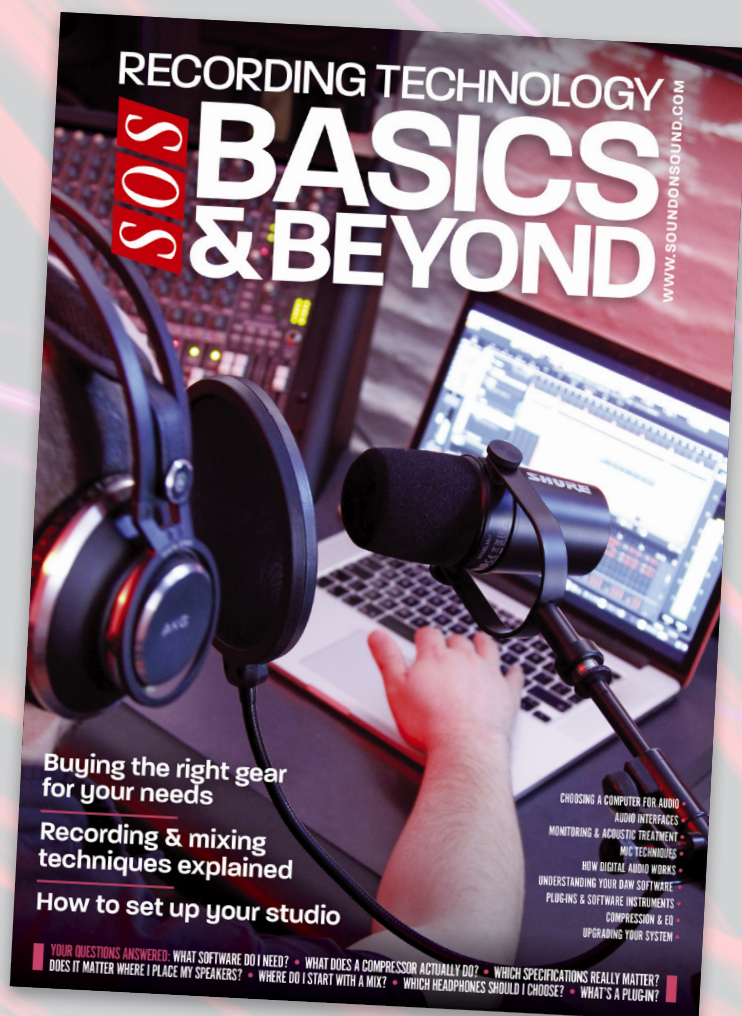# FREE eBook - RECORDING TECHNOLOGY: Basics & Beyond
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