

The Bass Player Book: Equipment, Technique, Styles & Artists

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Notes:

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Dynamic Processors: These affect a signal's dynamic – loudness and softness. The simplest is a volume pedal, which is just a knob you control with your foot. More complex circuits do the dynamic changes for you. A *compressor* reduces the dynamic range of your signal by making the softest notes louder and the loudest notes softer. Compressors smooth out the signal and can make your bass more punchy and consistent-sounding from note to note. They also protect the speakers from dangerous overdriven – although this job is often left to a *limiter*, a type of compressor that limits your signal from getting any hotter past a certain point. The other type of dynamic processor is the *expander* or *noise gate*. By making the softest sounds even quieter, an expander can lower your signal's "noise floor" by reducing the levels when you aren't playing.

Even though compressors and expanders are technically opposites, they're often used simultaneously – with great results. The compressor evens out your notes, and the expander cleans up everything in between. Single-unit compressor/expanders are commonplace recording in studios and complex rack systems.

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PART TWO EQUIPMENT

Recording Electric Bass:

A Step-By-Step Guide

By Karl Coryat

IS bass the most difficult instrument to record? It would be hard to argue otherwise. Bases produce frequencies as low as 30Hz, and in this region of the audio spectrum, notes get mushy, blurry, and muddy *very* easily. But basses don't just go low: They also produce frequencies that stretch into our hearing range's highest regions, especially when played slap-style. If that doesn't make things difficult enough, the bass is very dynamic instrument -and since low frequencies carry a lot of energy, it's easy to overload a stage of your signal chain (or an entire mix) even when you can barely hear the the bass over the other instruments. So recording a bass sound that's clean, punchy, distinct, deep, and powerful is a *tough job*.

Onstage, things are easier. Dynamic range isn't much of a problem -it's limited pretty much only by the pain threshold of the audience or the local noise ordinances (or, hopefully, by your money and good taste!). But the recorded medium has some important limitations: The dynamic range of compact discs is only about 90dB, some 40dB less than the dynamic range of human hearing (cassettes have a range that's another 20dB or 30dB narrower); as a result, recorded music must be "squeezed" into this dynamic region. Furthermore, lows tend to distort stereo loudspeakers more easily than the speakers in your amp. And when music is played on boom boxes and cheap car stereos, the speakers are often too small and inefficient to reproduce the lows faithfully, sometimes causing the bass to get hopelessly lost.

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What to Shoot For

It's often said that the one rule in recording is that there are no rules – but that's not 100% true. While it may be the case on a strictly artistic level, if you want your recording to sound as professional as possible, you have to strive to achieve several of the qualities that distinguish good records.

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Third, a recording should have *clarity*. If all the high end is wiped out somewhere in the recording process, the end result is a muffled sound – not good. Finally, a recording should have *competitive levels*, a highly overlooked factor. There's a psychoacoustic phenomenon that causes music to sound better when it's played louder. (You headbangers know what I'm talking about!) This occurs because the human ear is more sensitive to midrange frequencies than to highs and lows. The result is that if someone is listening to your tape along with others, the ones recorded at the highest possible levels (without reaching the distortion point, of course) tend to sound best and have the most impact. Sure, the listener could turn up the volume for the quieter tapes, but that would just increase the amount of background noise – and wouldn't you rather make a tape that sounds great right off the bat, without the listener having to do a lot of knob tweaking?

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The Signal Source

With any audio signal chain, the source is the most important link. In a stereo system, it's the CD player or turntable; if you're recording bass, it's the bass itself. Why? Because no matter how good your gear is, if the signal is screwed up to begin with, nothing in the world can fix it – at least not without side effects. So it makes sense to begin our recording setup with a good bass that has good pickups and electronics.

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If you have to settle for a buzzing bass, try to reduce the noise by checking for nearby fluorescent lights or rheostats (light dimmers); these are notorious for contaminating electrical signals. You might also try changing the direction you're facing as you play – with some basses, especially those with insufficient shielding, your physical orientation can have a marked effect on the amount of noise the instrument picks up.

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If your instrument is active, try switching to passive mode, if possible; sometimes that can yield a cleaner, quieter source sound.

Recording Direct

“Going direct” is the most common way to record the bass. Invented by engineers Geoff Emerick and Ken Townsend for the Beatles’ Sgt. Pepper’s sessions, direct recording is done by running the output of the bass (or guitar or keyboard) directly into the mixing board. This way, the signal doesn’t need to be passed through an amplifier and microphone, as was done during the early years of rock & roll; your sound stays clean and true as a result.

But there’s a problem: If you simply plug a cable from your bass into a 1” input jack on a mixing board or tape deck, you’ll get a sound that’s lifeless and dull. Why? The explanation is complicated, but it basically results from an impedance mismatch between your bass and the input stage of the board or deck. The result is a “rolling off” (attenuation) of high frequencies -the ones that give your bass sparkle, bite, and growl.

To keep those frequencies intact, you need to put a *direct box* or *DI* (direct input) between your bass and the board. These fairly inexpensive units contain transformers that match the impedance, allowing high frequencies to pass through unhindered. Most DIs have balanced XLR outputs, requiring hookup to your mixing board via a balanced-line mike cable. The good news is that since the direct box’s output is balanced, you can run a long cable between the box and the mixing board without picking up a lot of noise. The bad news is you need a board with XLR inputs, or some other piece of gear that can adapt an XLR cable for your mixer’s input jacks.

There are several kinds of direct boxes, ranging from simple stomp-box-like units to rackmountable ones; some are driven by tubes, and others have elaborate signal-shaping circuitry built in. It shouldn’t be too surprising, then, that they also *sound* quite different; if you’re buying one, try out several with you bass and decide which you like best. In any case, if you want a good direct sound, you *must* have a DI box; simply plugging straight into the board and cranking up the highs just won’t do the trick.

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Compression

One of the most popular studio effects for bass is compression. (See page 129.) In general, compression is effective in the studio because it makes mixing easier; when the dynamics of any one instrument are varying uncontrollably, it’s hard to get the instrument to “sit” in the mix and maintain a consistently balanced level relative to the others. Compression is especially good for bass -it can make a tone fatter, more punchy, and more present. “I like to use a lot of compression,” says George Drakoulias, staff producer/bassist at American Recordings and the man behind the Black Crowes’ breakthrough disc, *Shake Your Money Maker*. “I don’t know if you can go to far with it; I don’t think I ever have, except when I was going for a certain effect.” Very fast attack times and somewhat slower release times (between 200ms and 400ms, depending on the context.) generally work best for bass. The compression ratio determines how dramatic the effect sounds; it can range from 1.4:1 (for subtle compression) to 10:1 and beyond (which can yield “squashed sounds”).

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Miking the Amp

Recording direct is great, but in many cases the resulting sound is just *too* clean. If your goal is to make a song sound like it’s being performed live, a direct-recorded bass may sound artificial and out of place. For this reason it’s very common to record the direct line on one track and also send a line to a bass amp -and then mike the amp and record that on another track. In most cases, producers like to use the direct line for the lows, while the miked amp track provides the highs. This is especially effective for hard rock, where the sound of the bass amp being driven hard helps give the bass an aggressive, on-the-edge feel.

Not just any mike will do for these applications – it must be able to handle the low end well and also be able to take the high SPLs (sound-pressure levels) bass amps produce. This eliminates most condenser mikes, which aren't very tolerant of high SPLs.

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The Mixdown

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When thinking of EQ for bass, it's helpful to consider four main frequency bands: lows, low mids, high mids, and highs. The lows range from 30Hz (roughly the fundamental of a 5-string's low B) to about 100Hz; boosting this region increases the amount of "woof" and "depth" in your tone, although adding too much can muddy the mix and make it overly boomy. The low mids range from 100Hz to about 600Hz; this is the "meaty" part of the bass spectrum, providing fatness and note definition – but if it's used clumsily, the bass can get boxy sounding or cardboardy. The high mids, which range from 600Hz to about 3kHz, control growl and edge; too much boost here can make a bass sound harsh, and it can make finger and fret noise unpleasant. Finally, the highs extend above 3kHz to the limits of human hearing (as high as 20kHz); this region determines your sound's brilliance or transparency, especially if you're slapping. The tradeoff to boosting highs – and there's always a tradeoff – is it increases background noise.

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There's one more thing to consider during mixdown: signal phase. If you're using one direct track and one miked-amp track, the signal can get out of phase with each other; in other words, on track one the bass waveform may be going in one direction while on track two it's going in the other direction. If this is the case, when you combine the two the bottom can drop out completely. To remedy this problem some mixing boards have a PHASE button on each channel that phase-reverses the signal

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As any seasoned engineer will tell you, it's important to make sure your mixes sound good on many different speaker systems; if you mix on the wrong system, the low end is often the first thing to suffer.