Squeeze This!

Many bassists are familiar with the use of compression as part of their live rig, especially those who slap and pop. Their use of compression keeps the extreme peaks of the slap from blowing amps, speakers, and ears. In the studio, however, compression is usually a more subtle effect.

A compressor is basically an amplifier which cuts back its gain as the input signal level increases–it tries not to let the output level rise when you drive it harder. There are several standard controls on virtually all compressors, though some automatic units don't have all of them. The *threshold* control sets the point at which gain-reduction begins. When the input level goes above the threshold, the compressor does its thing; below the threshold, the compressor generally does nothing to the signal level. The *ratio* control sets the amount of gain-reduction, usually expressed as a ratio of input vs. output dB (e.g. 2:1, 3:1, 10:1). For example: using a ratio of 3:1, a 3dB increase in input level becomes a 1dB bump at the output; 12dB of input flattens to only 4dB at the output. A 1:1 ratio doesn't change the level at all, whereas an infinity-to-1 ratio stays put at the threshold: no matter how hard you drive the input above the threshold, the output won't budge a single decibel. At extreme ratios, a compressor operates as a *limiter*, locking the signal level. (See Figure 1 for details.) The "knee" of the compression curve is the point at which compression kicks in; some units have a hard-knee (as shown), while others provide a soft-knee, which smoothly curves at the knee. The soft knee is often more musical and less audible. The *attack* and *release* controls adjust the response time of the compressor: a slow attack allows leading transients to shoot thru before the compressor grabs the signal to tame the level. Setting the release too fast will cause the compressor to "pump" as it reacts again to the same note, while too slow a release will keep the squash going when the next note arrives. (Many units automate the attack and release times.) Most units also have an output level or makeup-gain control, used to make up for the gain-reduction and bring the signal back up where it should be.

Compression is often used while tracking as a limiter to keep signal peaks (especially from bass, vocals, and drums) from distorting the tape. On analog tape, it's often safe to let peaks overload the tape and cause pleasing distortion; on digital tape or hard disk, however, these peaks cannot be allowed through. Some fingerstyle bassists can be tracked without compression or limiting, but those who slap or play with a pick almost surely will be. The compressor also tends to fatten up the tone (especially if it's a high-quality tube unit) and will help compensate for notes played with poor dynamics.

During mixdown, a bass track is often compressed so that it will sit better in the mix. Compression does a wonderful thing to a bass, thickening the bottom and increasing the track's prominence without requiring a higher fader setting. Usually a little goes a long way: for a fingerstyle player, I often start with 3:1 and adjust the threshold to get 4-8dB of gain reduction. If you compress the bass heavily, it begins to sound more like an organ pedal: tons of sustain and almost no decay till the player mutes the note. (You can hear examples of heavily

compressed bass on many of the ballads played on soft-pop radio stations.) A 30-millisecond attack and about a half-second release is a good start. (If they're set too fast, the compressor will "chatter" as it reacts to the actual bass waveform.) For a slapper, slow the attack a little to let the transients through, push the ratio up (even to 10:1), and lower the threshold to cause more gain reduction (as much as 10-20dB). Use your ears when experimenting; set things the way they sound good, using these numbers as starting estimates. Try splitting the bass track, compress one copy, and run both into the mix. Set up the mix with the compressed copy to keep the bass sitting tightly in the groove, and fade up the uncompressed track where you want to add dynamics.

If you solo the bass track while mixing, it'll often sound terrible–but remember, what counts is how it sounds in the whole mix. Soloing the track will let you hear the effects of compression and EQ, but always listen to the whole mix before making any changes to the bass track.

Speaking of EQ, it's important to keep some of the upper overtones, squeaks and fret noises on the bass track for the mix. Don't automatically try to EQ all that junk out of the track (very tempting when the track's soloed, especially if the bassist is listening). These artifacts can improve the overall quality of the bass in the mix, adding a little punch and helping note articulation. Another point to remember is that many playback systems, especially those in cars, can't reproduce the lowest octave of the bass–yet we still seem to hear those notes go all the way to the bottom. How? Turns out there's a psychoacoustic effect with even-order harmonics: if the 2nd harmonic is reproduced, the brain "fills in" the missing fundamental. (This is a good argument for that nice 2nd-order harmonic distortion that tubes add.) It's also important to keep the mid-bass in the mix: you can cut a little 200Hz to clean up the mix, but leave enough 100Hz on the bass. Also, be aware that compression often adds bottom end, which you may need to tame with EQ.

Compression is one of the most commonly applied effects when mixing; used wisely, it can significantly improve lackluster tracks. Meanwhile, of course, you'll be practicing your technique–so you too can be one of those bassists who don't need compression during tracking.

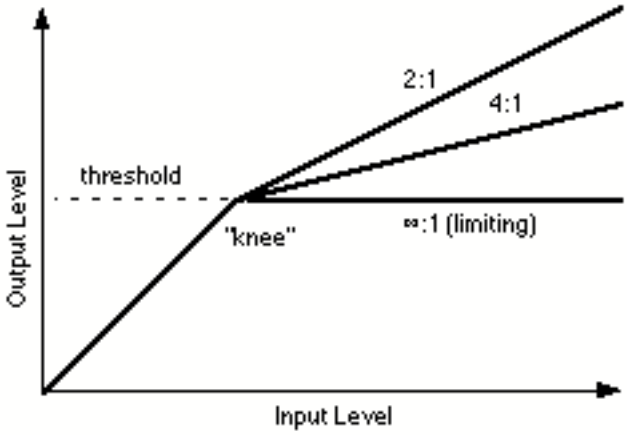

Figure 1.