



PRIME LOOPS

The Art of Compression

Compression is one of those topics that understandably confuses many producers across a wide range of experience levels. I think this largely comes down to the overwhelming amount of misinformation all over the internet relating to the topic. The most important thing to know is that like any audio effect, there is no "magic setting" which will be effective on every sound. Each audio source demands unique settings depending on its characteristics. Let's take a look at the parameters of a standard compressor and how they relate to one another, and along the way we'll begin to see a simple, straightforward workflow emerge. However, we'll start with some general information about compressors.

So what is a compressor and why is it useful? Generally speaking, a compressor is just a volume knob that turns up and down automatically. It's useful for when your audio levels are imbalanced in some way. Perhaps your drum kit is sounding pretty good other than a few rogue drum hits that are inordinately louder than the rest of the pattern and it's throwing off your mix. Generally, the best way to approach this situation is to actually look at the reasons for why this is happening and fix those individual drums. However, when you have a bunch of effects and automation running over your drums, changing any of those things will also detract from some of the cool sound you have achieved. In this situation, it might be better to strap a compressor on your drum mix and tweak away. Also, a nice side effect of using a compressor is that it can be so much more than a utility for reducing gain discrepancies: It can add some new dynamics to your sounds that would be hard or impossible to achieve otherwise. This has a lot to do with the design of the compression algorithm, a factor that is unique to each different compressor.

Let's take a look at the basic compressor in Reason, the COMP-01. I chose it because it is representative of the standard controls on most compressors:



Here's a quick rundown of what the controls do:

Ratio: The amount of compression that occurs when the compressor is triggered. It is expressed as a ratio, where the first number is how much the gain is reduced compared to the second number, which is always "1" and which represents the full level that is entering the compressor. For instance, a ratio of "4:1" means that the volume will be reduced by an amount that is 4 times the signal being compressed. Therefore, higher ratios equate to lower gains coming out of the compressor. If ratio was the only control present, the compressor would be no different from a simple volume knob.

Threshold: The level that incoming audio must reach before the compressor takes effect. Any incoming signal that is below the threshold level will simply pass through the compressor, unaffected.

Attack: The first of the compressor's two envelope controls. Attack is the amount of time it takes for the compressor to fully kick in, starting at the point at which the threshold is reached and ending when the full gain reduction is applied. The lower the attack setting, the faster the compressor will reduce the gain.

Release: The second of the compressor's two envelope controls. Release is the amount of time it takes for the compressor to fully disengage, starting at the point at which the incoming audio signal falls below the threshold, and ending at the point where the gain is unaffected by the compressor. The lower the release setting, the faster the compressor's effect will dissipate.

The compression workflow

Right now you may be more confused than you were before you started reading. That's because you only have half the story on how the compressor works. These controls don't just exist in a vacuum, but rather they interact in a workflow that you should consider every time you utilize a compressor.

The first part of this workflow, predictably, is triggering the compressor in the first place. Referencing the parameter descriptions above, we know that

the compressor is triggered when the threshold is reached. Therefore, the threshold is the first thing that you should set. Set your threshold all the way up and start your track playing. The compressor shouldn't be getting triggered at this point because the threshold is far higher than the maximum level of the audio going into it. Now start to bring the threshold down, slowly, until the gain meter on the right side of the compressor starts to move around. That's how you know the compressor is being triggered and starting to affect your sound.

The second part of the compression workflow is deciding how much you want the audio turned down when the threshold is reached, which means adjusting the ratio. Set your ratio to 2:1 or slightly more to start with, or just enough to hear the compressor having an effect.

At this point, the compressor is being triggered when it reaches the threshold level and it's reducing the audio level by the amount determined by ratio. With just these two controls, your audio peaks are being reduced to a level that's closer to the rest of the material. That is, you're flattening out your audio signal. As a result, extreme settings will flatten your signal out so much that the dynamics of your track will be squashed out of existence. Sometimes that's a desirable effect, sometimes it's not. It's almost never a good idea to do this to your entire mix, but some genres of music depend greatly on heavily compressed drums. Adjust your settings and let your ears decide!

The following are my recommended threshold and ratio settings to start out with (ratio at 2:1 and threshold at a level where the incoming audio is causing visual changes in the gain meter as well as an audible change):



The third, and last, part of the compression workflow is adjusting the envelope controls: Attack and release. If you are compressing short, percussive sounds such as drums and stabs, longer attack settings tend to be preferable. The reason for this is that short sounds tend to be defined mostly by their attack transients, i.e. the first part of the sound. If you set a short attack time on a drum compressor, you risk eliminating those transients during the attack of the sound. For drums, start with a long

attack and keep reducing it until it affects how hard your drum initially hits, and then bring the attack back up to the lowest level where your drum still hits hard enough. If you're compressing longer sounds such as pads and leads, shorter attack times are more acceptable because these sounds are often more defined by their sustain phases.

Now set your release control. A shorter release time will result in the compressor bringing your audio back up to the level of the incoming signal more quickly. If you use a short release on drum sounds, you'll get that characteristic pumping drum sound that you hear a lot in techno. Longer release sounds tend to result in more transparent, natural compression effects, where the audio is brought back up to its normal level at a slower, less noticeable rate. For pad and lead sounds, the release time largely depends on how much gain change there is over the sustain of the sound. If the sound is huge and evolving, you will likely want to set a medium to long release phase. If the sound is pretty steady in how it sustains, you can probably get away with a shorter release phase, but again this is heavily dependent on the individual sound.

A couple of example compressor setups:

An example of compression settings for pumping drums. I have the attack set high enough not to squash the attack transients of the drums, and I have the release set short enough to create a dramatic sense of pumping on the sustain phases of the drums. I have threshold set a little more than halfway down so that the compressor is being triggered quite often, and the ratio is set so that the pumping is noticeable but still retaining most of the dynamics of the original drum track:



An example of compression settings for a long pad sound. I have the attack set much lower than in the drum example because the pad sound has a long attack phase that rises in level very gradually. I have the release set somewhat high so that the compression sounds natural I have threshold set high because I only want unnaturally high peaks in the incoming signal to be reduced. The ratio is set around 2:1 so that it gently shaves off the peaks while allowing the rest of the sound to play out normally:



Again, compression settings depend heavily on each individual sound being compressed. For instance, the example settings above for the pad sound might have worked really well with the particular pad that I was working with, but they might need significant tweaking for a different pad. All too often, I see people on forums recommending specific compression settings for general types of sounds. This is incredibly misleading because every sound is different!

That does it for our basic introduction to compression. It's one of those effects that is helpful to read about and even more helpful to actually experiment with. There's absolutely no substitute for listening to the effect of compressor settings in a wide range of material ranging anywhere from drums to vocals.

Keep practicing, have fun, and stay creative!

- Nick Maxwell

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