v1.0   Signal Processing Order in Mixers   19-Jan-23

Question:

Should I use digital signal processing, DSP, on individual input channels or on the overall mix? What are the differences, advantages, and disadvantages of individual channel processing vs overall mix processing?

Answer:

The answer is more complicated than at first glance. While a full discussion of this topic is more suited to an audio degree program, here are some thoughts that may help with mixers in general and Soundcraft digital mixers.

Individual Channel Processing-

Inserting the compressor, limiter, gate, or other digital signal processing, in the channel strip's signal chain is the most preferred method utilizing DSP. By inserting processing in the input channel, lets the affects occur before the final output faders. The final mix out is affected by changing individual channels but only via that single channel. Manipulation of the volume of the overall mix will not affect the threshold and operation of the processing in individual channels. You also will hear this audio processing when you solo individual channels affected by DSP or when you solo the L&R of the overall mix.

The biggest advantage is that each channel is processed individually, changes on that single channel only affect that channel. If that channel gets compressed and/or limited, it helps keep the channel at same volume in the mix, preserving the overall mix itself. The biggest disadvantage is the cost and wiring of external processors on analog mixers. Most digital mixers from Soundcraft have individual channel processing built in by default and do not require external processors.

Processing the overall Mix-

The other way operators use DSP is after the main output of the mixer. Daisy chaining in line with the mixer and amps, or on a main L&R insert. This works, but you lose features that you would get when using individual channel processing. Any changes in mix will affect the threshold and amount of limiting or processing. The worst issue and largest disadvantage with overall mix processing (with no channel processing) is when a certain channel gets louder, it can trigger compression and/or limiting from that single channel and then appear to "duck" the rest of the mix down in ratio to that single louder channel.

As an advantage, in some cases, like a main vocal and background vocal mix, you may want to keep the main singer on top of the BGV. This can be done by compression and/or limiting on a subgroup, with the main vocal being the channel hottest in the mix. The main vocal will trigger the processing, being the hottest in the subgroup, then the rest of BGVs will be reduced in a ratio, staying under the main vocal. that will trigger the threshold and obtain processing.

There is no "Correct" way to run audio from your mixer. These thoughts are suggestions and common issues that the Soundcraft team and its users have come across over years of experience in audio.