Mid-Side Processing De-Mystified

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Mid-Side processing in Mastering has been termed a “Dark Art” by some, in that there seems to be some mysterious ritual and incantations needed to perform such magic. In this article, I want to de-mystify Mid-Side and show you just how powerful of a technique it can be in order to work with your standard stereo spread in a different and more surgical manner. Imagine a level of precision to add equalization, compression, or other effects processing specifically to the audio that is right up the middle or only on the sides of the stereo buss. You could, for example, use a compressor with a high-frequency crossover to manage the sibilance of the high hat in the side channels only, while leaving it untouched in the mid. You could apply equalization to just the sides to manipulate the stereo image. The creative possibilities open up wide for the mix and mastering engineer when applying Mid-Side techniques.

History of Mid-Side

Alan Blumlein, in 1934, devised a recording theory which would produce a mono compatible stereophonic recording.[1] He patented this stereo method and it has since been attributed with the invention of stereophonic recording. Due to its mono compatibility, Mid-Side has been one of the more popular techniques used in radio broadcasting where the same signal can be sent and reproduced in either a mono or stereo listening environment.

Danish audio engineer, Holger Lauridsen, was attributed with the invention of Mid-Side mic technique in the 1950’s. The compatibility with mono also was important for record production. In this period, the majority of listeners still only had monophonic equipment and stereo recordings had not yet entirely replaced mono recordings.[2]

How Mid-Side is Recorded

Mid-side recording technique consists of two microphones, both located together at an equidistant point distance from the source. This is a coincident technique, given that the microphones are positioned next to one-another, the stereo field is created by differences in level rather than position.

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The microphones used are key to obtaining the stereo image. The first microphone is usually a cardioid or omni-directional microphone, pointed directly at the sound source. The second microphone is a bi-directional, figure-8 polar-pattern, positioned to pick up the sides. Each of these microphones is recorded on its own channel and the resulting mix can then be decoded to separate the center from the sides of the source signal. In a digital domain, the plugin would provide the Mid-Side decoding in order to separate the signal.

How the Listener Experiences Mid/Side

If you offer the listener the middle channel, they will experience the audio in a monophonic image. By adding the side channels, the listener will experience a stereophonic image. That stereo image width can be manipulated by increasing/decreasing the side channel level, thereby, increasing/decreasing the stereo image. In effect, the sum of the Mid-Side is being manipulated to modify the stereo image as a result of the phase relationship between the two mics used in the recording. The mid is created by combining the right and the left side, whereas the left channel is created by summing the mid + side, and the right channel is created by the difference of the side from the mid.

We can think about the mid as everything that is the same between the two channels. Conversely, we can think about the sides as everything that is different between the two channels. Thinking in these terms we can look at how the user will experience the audio. For example, the proximity of listeners to their audio source. If you are panning hard to one side or the other, a listener on the strongly panned side will have a different listening experience to that of the listener on the weakly panned side. This becomes important when you begin working in Mid-Side processing and taking the listener scenarios into consideration when performing the processing work. If the goal is to provide listeners with a consistent sound, no matter where they are sitting, then it becomes evident that the mid (center) channel is where the most important elements of the audio belong. This would include elements like vocals and lead instruments. Then, we can use the sides for background and accompaniment and other elements that are appropriate to build the stereo image.

When Should We Leverage Mid-Side

Mid-Side gives the engineer a great deal of leverage for management of the stereo field. Remember that everything that is not equal will be in a side channel and everything that is equal will be in the middle. If we want to manipulate an element to move from the center out to the sides, we can apply techniques such as eq and spatial effects. You could apply effects to the sides and the result would be a greater stereo width due to the increased difference between the mid and the side signals.

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Basically, any time that you would want to manage the stereo image field or apply specific processing to the center or side, independent of one-another, then you may want to apply Mid-Side processing techniques.

For the most part, Mid-Side processing techniques should be applied with a light hand, especially in the mastering process. However, the creative possibilities opened up to the engineer provide for any number of ways to implement processing that is independent of either mid or side, inclusive of the entire mix, or manipulates the stereo image in a way desirable to the production.

Where To Go From Here

If you are an artist, mixing, and/or mastering engineer and are interested in getting started experimenting with analog Mid-Side techniques, it will be necessary to have a recording that was created with Mid-Side miking. Then, it is possible to work with a Mid-Side matrix in your mixer or DAW with suitable plugins. In the digital domain, any stereo signal can be converted into a Mid-Side signal, thus, providing the ability to apply Mid-Side processing to any stereo audio source.
Mid-Side can provide you with a surgical precision to manipulate the stereo field, adjust specific frequencies and even instruments which occupy the mid or side spaces. This allows the engineer to leverage a great deal of creative power over the audio, even in the final stages of production.
If you are interested in assessing what having this type of processing applied to your mix or master would do for your project and you wish to find a mix or mastering engineer to provide those services, Resonance would be very pleased to help meet your needs. Feel free to contact us at any time to discuss: https://www.resoiso.com/#contact

Bibliography

[1] Beacham, Frank. “Mid-Side Stereo Recording for Broadcasters”. https://www.thebroadcastbridge.com/content/entry/11743/mid-side-stereo-recording-for-broadcasters. The Broadcast Bridge. 09 Sep. 2018

[2] “Not new, but newly discovered: Mid/Side Processing”. https://www.sonible.com/blog/mid-side-processing/. Sonnible. 14 Nov. 2018

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