

# SIDES SHOW

## An Introduction To Mid-Sides Recording

M-S miking is easy to set up, offers plenty of options at mixdown, and has some unique advantages over other stereo arrays. So if you've not yet tried it, why not give it a go?

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Most *SOS* readers will have heard of Mid-Sides (M-S) recording, but I suspect many will have shied away from actually trying it. Perhaps the idea of creating a 'decoding matrix' triggers a brain freeze, and it all sounds too complicated? Well, it really isn't, and I'd urge everyone to try it. In fact, M-S is one of the most flexible and forgiving stereo recording techniques, making it really beginner-friendly.

You don't need particularly expensive gear, and free plug-in decoders mean you no longer have to create a 'matrix' yourself. You can dial in as much or as little 'room' as you want, during or after recording. And if you screw it up or you simply don't like the room sound you captured on the day, you're left with a perfectly good mono recording — which is more than can be said for many other stereo recording techniques.

In this article, I'll set out in simple terms what gear you need, how to set it up for good results, and how you might manipulate the sound after recording.

### What Is M-S?

Mid-Sides isn't just a recording technique, it's a whole different way of looking at stereo. But it's not hard to get your head around. Like standard Left-Right (L-R) stereo, Mid-Sides uses two channels. But instead of one carrying a signal for the left speaker and another for the right, one (the Mid, or 'M' channel) carries the information that's common to the left and right sides, while the other (the Sides, or 'S') carries information about what's different between left and right. In practice, the level of the Sides signal determines how wide the sound is when played





back in L-R stereo, and also the amount of room ambience in the decoded signal. If you monitor in mono, all you'll hear is the Mid; your Sides signal disappears completely.

Mid-Sides miking is suitable wherever you'd normally use a coincident array — such as an X-Y crossed pair, or a Blumlein array (crossed fig-8 mics pointing left and right). There's nothing wrong with those techniques, and they all share the same advantage over spaced arrays in that they inherently have a stable stereo image, but M-S recording can neatly side-step some of the disadvantages of those other coincident formats.

First, when using any X-Y or Blumlein array, sources in the centre of the sound stage don't hit either mic on-axis, so they'll be subject to the off-axis coloration inherent in directional mics (their off-axis response is generally less sensitive to high frequencies, typically delivering a 'darker' sound than intended). In M-S recording, sound at the centre of the 'stage' will hit the Mid mic on-axis, usually resulting in a cleaner capture of the centre, and a cleaner mono sound. This could be important if a 'mission critical' source such as someone playing a solo is in the centre of the sound stage. Second, unlike most other stereo arrays, you don't need a matched pair of mics for it to work. Third, Mid-Sides miking is highly mono-compatible, so as long as you're careful with where you place your array, you'll get a decent sound out of just the Mid mic. A related bonus is that you can adjust the stereo width of your recording after the fact, by turning the Sides mic up or down in volume.

### Getting Started

To record in M-S, you need two mics — and two cables, two preamps and two input channels on your audio interface. It's possible to mount the two mics on one mic stand with a couple of booms, but it's often easier to use one stand for each. There are also stereo mics that can be configured for M-S recording.

The Mid mic is set up just as you would any mic for a mono recording — to capture the whole source you're recording — and the Sides mic needs to be at exactly 90 degrees to it. You

can use any polar pattern for the Mid, but different pickup patterns will yield different results (see 'Mid Mic Matters' box). I'd suggest starting your experiments with a cardioid mic.

The Sides mic must be a figure-8 type: in other words, one that captures audio with equal sensitivity from either side, but in opposite polarity. Most multi-pattern capacitor mics offer a figure-8 pattern, and these will usually work fine, though technically, a 'true' or 'single capsule'

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figure-8 mic will give slightly sharper imaging at high frequencies. Most ribbons are true figure-8s, but a few have the ribbon placed asymmetrically in order to offer a different tonality front and back, and these are less well suited.

With your Mid mic set up, orient your Sides mic perpendicular to the Mid, with its front lobe pointing left as viewed from behind the array, and its null axis aiming

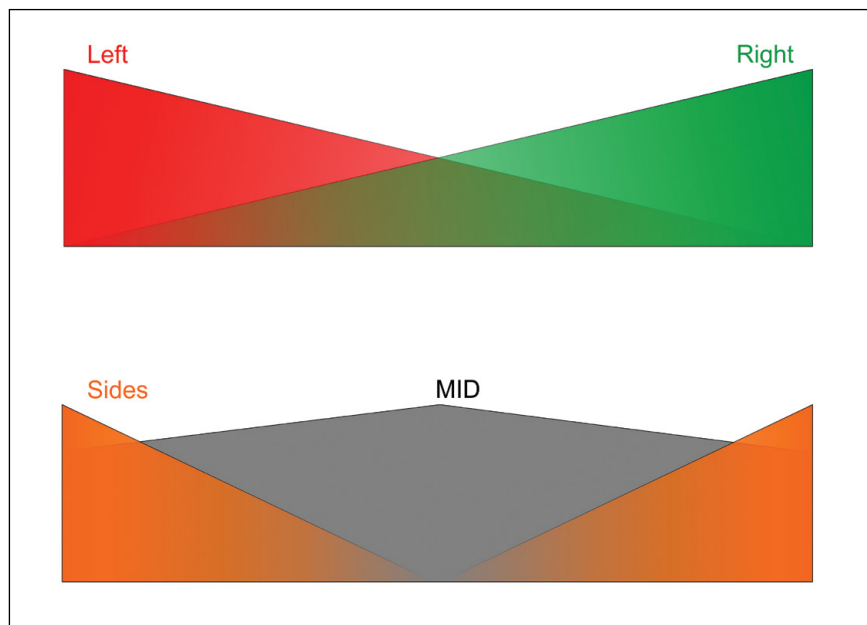
directly at the middle of the sound stage. This way, the Sides mic picks up the room sound from both left and right, but nothing from directly in the centre. (If the Sides mic is rigged to point to the right, or if the Mid and Sides mics are wired with opposite polarities, the decoded stereo image will be left-right reversed!)

### Monitoring

Unlike most other stereo arrays, you can't audition an M-S array directly, so it's important to listen to the decoded L-R output of your array while setting up and recording. Otherwise, it's all too easy to put your mics up where you think the centre of the sound stage is, only to find that once

you decode the results, your kick and snare drum are way off to the left, or your piano's middle-C is over to the right. (For this reason, some location recorders and audio interfaces include a built-in M-S decoder facility.)

In days gone by, engineers would convert M-S to L-R by setting up a matrix on the recording console. The Mid mic would be put up on one channel panned >>



In L-R stereo, the left channel is most sensitive to things panned to the left. As something is panned towards the right it contributes less and less to the left channel and more to the right, and something hard-panned right does not appear at all in the left channel (and vice versa for the right channel). In contrast, in M-S, the Mid channel carries everything — it's most sensitive to things in the centre, but wherever a source appears within the stereo sound stage, it will be carried to some extent by the Mid channel. The Sides signal mostly carries things at the edges, losing interest as things move towards the middle, where it carries nothing at all from the centre.

## Mid Mic Matters

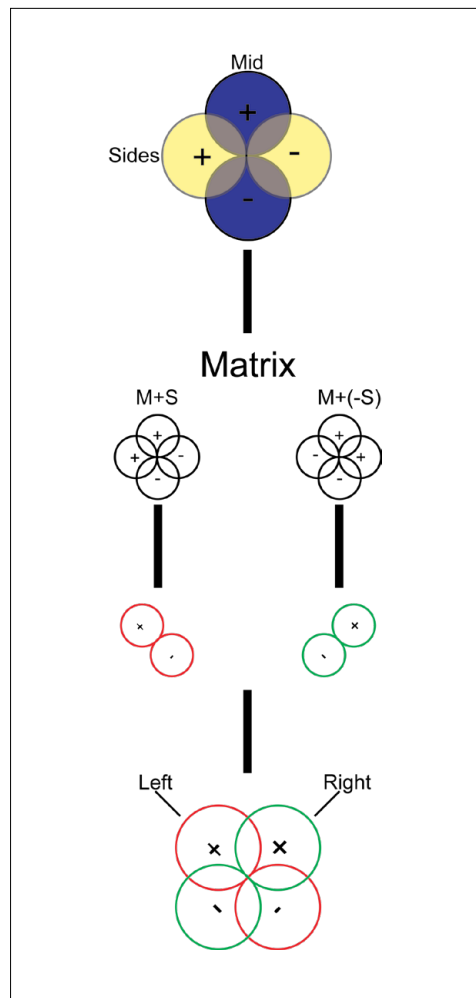
The Mid mic can be unidirectional (cardioid, hypercardioid and so on), omnidirectional or bidirectional (figure-8). They'll all work, as whatever else they capture they'll pick up the sound coming directly from the source. But, in general, your choice of polar pattern should be determined by how wide you want your stereo recording angle (SRA) — essentially how far to the left or right a source can be before it ends up coming out of only the left or right speaker — to be. If you've tried other coincident arrays, it may be useful to know that, assuming equal gain for the Mid and Sides mics, using a figure-8 mic for the Mid is the equivalent of a Blumlein array (crossed figure-8 mics at 45 degrees to the source), and an omni will produce similar results to a pair of back-to-back cardioids. A cardioid Mid is directly comparable to an X-Y pair of supercardioid mics crossed at 127 degrees (again assuming equal mic gain). These configurations all have different SRAs, with omni being the widest (102 degrees), cardioid being slightly narrower (98 degrees) and supercardioid being the narrowest (76 degrees).

So the polar pattern you choose for your Mid mic will be determined by how far to the sides your performers are (or how wide the instrument is if you're recording a soloist), as well as how much room sound you want in your recording, and the sense of perspective you're trying to achieve. For that last point, the closer to the source you wish to be, the better a wider pattern will work, and the more distant, the narrower it needs to be.

Your choice of Mid mic will have a major effect on the pickup pattern of your combined array. Pictured is what happens if you use a figure-8 for the Mid: you'll pick up sound from the front and left of the array, as you'd expect, but you'll also capture sounds to the rear — and in the case of a fig-8 Mid mic, the rear pickup will be left-right reversed.

One important consideration is that omni and figure-8 Mid mics are equally sensitive to the front and rear. In the case of a figure-8 Mid, your array will have a mirror-image SRA behind it, and with an omni Mid, your array will pick up sound from everywhere around it (although at the extreme left and right of the array, you won't get a stable image as the inter-channel level differences are so large). In practical terms, this means you'll pick up more room sound than you would with, say, a forward-facing X-Y pair, so you may need to move your Mid-Sides array closer to the source to get the desired direct/ambient sound.

You can use this phenomenon to your advantage, though: the front-to-back symmetry of such an array means that your musicians don't all need to be in front of it — they can be behind it too. In the case of an omni Mid mic, players to the front-left and rear-left of the array will both appear in the left side of the decoded stereo image, whereas with a figure-8 Mid mic, the rear pickup will be left-right reversed, so a rear-right sound source will come out of the left speaker, and *vice versa*.



» centrally, and you'd split the Sides mic's signal on two separate channels on your console, opposite-panning those channels hard left and hard right. You'd invert the polarity of the channel panned to the right to give you the positive and negative Sides signals discussed above.

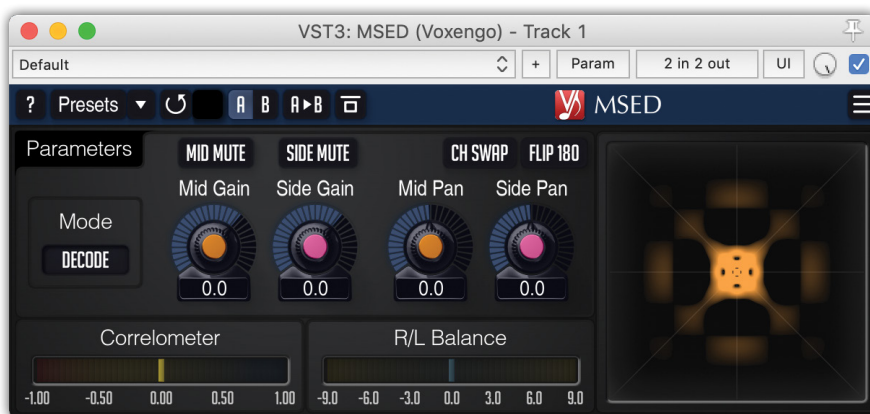
Then, when a sound on the left hits the Sides mic, it appears in the Mid and a little on both sides. But the positive (left) Sides signal and the Mid combine, while the negative (right) Sides signal cancels with the Mid. So you're left with sound coming from left of centre.

If a sound comes from the right of the sound stage, the opposite happens. And if it's on-axis to the Mid mic, the Sides mic doesn't capture anything anyway, leaving you with the Mid only.

Today, you don't need to duplicate or polarity-invert anything: an encoder/decoder plug-in can take care of all that for you, with perfect precision. Just capture the Mid and Sides mic signals to a stereo track in your DAW, with the Mid mic feeding the track's Left channel and the Sides mic feeding the Right. Insert an M-S decoder plug-in (I tend to reach for Voxengo's Mac/Windows freeware plug-in MSED, which offers some handy facilities in addition to the encoding/decoding) and you're done. Use the plug-in's level controls to balance the M and S signals to taste.

### Practicalities

As with any coincident array, the mics' capsules need to be as close as physically



Voxengo's free MSED is one of several free plug-ins you can use to decode and manipulate an M-S recording without the need to set up the routing manually.

## Matching Mics?

To me, one of the most appealing things about M-S is that you can capture a decent stereo recording even with two very different mics — because, essentially, the matrixing/decoding process is synthesizing two identical virtual X-Y mics. Indeed, it can even be desirable to have different-sounding mics — a brighter-sounding Sides mic, for instance, can yield a similar sense of spaciousness to a Sides-only EQ boost. True, mismatched mics will result in a slightly varying stereo image width at different frequencies, but that's generally quite difficult to hear, and it's easily corrected with Sides EQ. What's more, it's only really possible to use matched mics in an M-S array when using two identical figure-8 ribbons — and that comes with a few 'gotchas' (see 'Mid Mic Matters' box). More common is to combine a figure-8 Sides mic with a cardioid or omni Mid, but even if you use two identical multi-pattern mics, their responses will always be slightly different in figure-8 mic and cardioid/omni modes.

possible to avoid comb filtering and ensure a sharp stereo image. Their capsules should be vertically aligned, so you place one mic directly above the other — but to avoid problems with vibrations it's best if the mics' bodies don't touch. You want to be sure your mic stands won't droop over time, and if you're investing in mics specifically for this application it's better to choose models with minimum space between the mic grilles and the capsules.

It doesn't usually matter which mic is above the other, and you can allow practical considerations to rule. For example, if one mic is noticeably heavier I'll often put it underneath, where a longer boom won't be needed, to reduce the risk of 'droop'. Or I might choose to put the Sides mic below, because I find it easier to inch it up towards the Mid mic rather than down. The Sides mic should really 'just work' once in place next to a well-positioned Mid. So to avoid wasting effort setting it up more than once, spend a little time setting your Mid mic in the optimum position and with appropriate gain in your mic preamp before placing your Sides mic.

Speaking of gain, don't be tempted to match the signal level coming from each mic using meters. The Sides signal will naturally be quieter than the Mid one, so expect your meters to reflect that. If using similar mics and preamps, a good approach is to set the gain for the Mid (recording at 24-bit and leaving adequate headroom to avoid clipping), then use the same gain setting on your preamp for the Sides mic.

### Final Thoughts

That's pretty much all you need to know, so why not get out there? Find some nice spaces — or explore your own less-than-perfect space in search of the best-sounding positions. Make some recordings, and afterwards, have a play with the M-S balance. Maybe try EQ'ing the Sides signal only (boosting/cutting the high end, rolling off the low end and so on) to hear what happens. You can also process the Mid and Sides signals independently, as Eddie Bazil explored in his Creative M-S Techniques feature in SOS November 2019: <https://sosm.ag/creative-mid-sides>. Or try building up a track by overdubbing different sources in M-S. There's a whole world of space to discover! **///**



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