Overheads - Mastering the Art of Recording Drums

Foundation of Drum Recording

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This guide is about creating a strong foundation for your drum recordings.

I believe that a great drum recording will rest on the sound of the overhead microphones. These microphones not only record the sound of the cymbals, but the sound of the drums, and the location of each element in the stereo image of the kit.

The overhead mics start as an outline that we fill in with the close mics.

Overhead mics in the studio is much different than setting up overheads for live sound. In live sound, it doesn’t matter where the mics are, as long as they pick up the cymbals on each side of the kit. Overhead mics for live sound are often centered around the kick drum, and the sound of the snare is mainly from a close mic such as a sm57.

In studio recording, we have to treat the drums as a complete instrument that is made up of many elements. Together these elements make a single drum set, played by a single performer. Therefore we treat the drums as a collection of elements that make up a single kit.

What is center?
In recording, the center of the kit is very important, and slight adjustments can make a big difference in the balance of the drums. In live sound, there is natural sound coming off the stage, and the audience gets a sense of what the drums sound like by several factors. In recording, we are providing them with 100% of what they will hear, and any mistake will be much more obvious. - No direct sound to cover up a mistake.

With the three steps that follow, we can make sure that you are achieving a great foundation. And with a great foundation in your overheads, the drum tracks will mix a lot easier too.

1 - Divide the Drums

Most look at a drum kit from the front and think of a drum kit set up on stage. On stage you put two mics on either side of the kit, and call it a day.

But for recording you have to consider what is center, and then at what angle will you approach the drum kit. (Picture on the right shows that snare is NOT centered, just like a live set up)

The snare drum is always centered in my recordings. It’s the drum that has the most range out of the entire kit, and contains frequencies that que the listener in on what type of flavor the drums will have for a song. Change the snare drum, and the whole kit sounds like it was swapped out.

The snare joins the lows from the kick, (At 100 - 120 Hz) and the high frequencies blend in with the hihat and the cymbals. The snare nearly covers the entire frequency range of a drum kit. So this is why it is almost always centered acoustically between the overheads.

Distance from the Snare is Key

No matter the location of two mics, if you want the sound of the snare to be equal in both microphones (The same model of mic), they need to be the same distance. This distance is matched between the two microphones and the center of the snare drum. I often use a 10 foot guitar cable for the job.

But even if both mics are the same distance to the snare, they can be placed anywhere around the kit. There are some basic questions that we still have to ask:
• How do we know where the two mics should go?
• How high up?
• How far apart are the mics from each other?
• How are the mics pointed?

Slicing the Drum Kit

With the snare drum as a fulcrum, we can swing a line across the kit from a variety of angles.

We could draw this line coming right over the hi tom. Or perhaps over the kick drum and ride cymbal. We could even come over the floor tom, and still have our snare centered between two mics. Remember, the snare drum is the fulcrum that the center divider line swings from.

For a wider stereo image of the drum kit, you should divide the kit over the hi tom. This is a classic approach, and you will notice that the hihat is noticeably off to the right. The ride cymbal will be much more off to the left as well.

If you divide the kit coming over the ride cymbal, then the stereo image of the kit will narrow. This is because the ride is now right in the middle, and the hi hat is further away, but still closer to center.

2 - Decide on the Height

The height of the overhead mics can be fairly simple. I often set them up to be about head height for me as I’m standing behind the kit, about 6 feet off the ground. This gives the drummer enough room to swing his sticks and not hit the mics.

Lower overheads will capture less room and more drums. Higher overheads will capture a little more room sound.
Room Sound vs Direct Sound

First consideration is to ask yourself how much room sound do you want to capture with your overheads.

Perhaps you are setting up room mics, so you don’t want much of the room getting into the overheads. A low position of 5 feet off the ground would be a good choice, but make sure the drummer won’t hit the mics.

If you don’t have enough microphones for a pair of room mics, then you can capture the room with the overheads. A high position of 7 feet or higher would be a good choice. Keep in mind that compression of the overheads will bring out the room sound that is embedded in the recording. There is more room sound than you may realize, and once you compress the overheads, the room sound may be too much. Take your time, and fine tune the balance of room to direct sound, by trying out a few different heights in your room.

Narrowing at High Positions

Another thing to consider is that as you pull away from something, the angle of view becomes less. For example, you can get the effect of being at a movie theatre by sitting a foot from your TV or computer screen. Sit far away from your TV and the image will be a smaller.

In the case of drum recording, a pair of mics that is set up in XY configuration for example, will capture the kit wider when low, and narrow when high.

Application so Far (With Scenarios)

We now have two ways to widen and narrow a drum kit.
  ● Splitting the drum kit
  ● The height of the mics
The widest way to capture a kit would be coming in from the front of the drum kit, and using a low position.

The narrowest way to capture a kit would be to come in from over the kick and ride cymbal, and use a high position.

If you have a bad room, use a low position to minimize the room sound as best you can, and then choose your stereo wideness by the angle that you slice the kit.

If you are real low, you can come in over the kick/ride so that it’s not too obvious of how close you are to the kit, as this angle resembles the narrowing of a higher up position, but of course a much dryer sound.

You could also make an XY configuration a little more interesting using these techniques. To my ears the XY configuration always sounds narrow and a little boring. Coming in from the front, or positioning the mics low will help widen the stereo image of the kit for XY.

3 - Choose the Technique (4 General Types)

The final step for setting up overhead microphones is to choose your technique or the configuration of the microphones. You may have heard the terms “XY” or “Glyn Johns”, and this is where those elements come into play.

1 - Coincident

Coincident is a stereo mic configuration where two mics are as close as possible together. This is the XY, Blumlein, and MS. Which all can look very similar, but XY is with two cardioid mics, Blumlein is just an XY but with two figure 8 mics (Ribbons), and MS is XY with the X mic facing directly down, and the Y mic facing the sides in Figure 8 Mode (Or a ribbon mic).

Coincident is very easy to set up and get things “Right”. I recommend for anyone starting out, to start out with an XY or an ORTF (See below in the next section).

A stereo bar makes setting two mics up a lot easier, but I did this for a long time without one. It takes two mic stands and you have to be careful not to bump one of the mic stands.
The R88 ribbon mic pictured in the video (Right) is two ribbon microphones in a XY configuration. It’s regarded as one of the best options for drum overheads as it’s just so easy to set up, and get amazing sounds with little effort. Some have called it “Cheating”.

But you can get great sounds still with two of the same mic, and in XY. Just bring the tips of the mic together, and point them away from one another making a 90 degree angle. Use the steps above to determine how you approach the kit (Slice it), and how you set the XY configuration.

2 - Near Coincident

This is when two mics are close to each other, but not right on top of one another. This would be NOS and ORTF for example. There are several others, but my favorite is ORTF. It is supposed to emulate the space between your ears, and the phasing that happens because the mics are not right on top of one another can be very pleasing to your ears. I find the ORTF to be a very interesting sound, and musical.

The ORTF is where the mics are spaced 17cm apart, and at an angle of 110 degrees. The NOS is where the mics are spaced 30 cm apart, and at an angle of 90 degrees.

3 - Spaced Pair

Spaced pair can come in many forms. Most will place one mic over the floor tom, and because both mics are of equal distance to the snare, the second mic will be to outside (Audience right) of the hihat.

It may appear that the hihat side microphone is too far out to one side, but if it measures to the snare the same distance as the other mic, it’ll sound ok.

I find that spaced pair can be very challenging for drums. It can take hours to get right, and you still may not get the best results from a spaced pair.

This is because only one element of the kit is going to be phase coherent - the snare drum. Everything else will be of slightly different distances.

You will also have a variation of perspective from each mic. Some mics will be directly over a crash cymbal, will the other microphone will be at a 45 degree angle. This cymbal will rock back and forth on it’s stand, and as it does it produces a swirling effect.
The kick will also sound different to each mic. One mic will pick up more low end, while the other will pick up the attack off the back. This just adds to the madness when you are trying to get a good drum sound, and why I continue to recommend XY, Blumlein, or ORTF to limit the variables that come up in drum recording.

4 - Asymmetric

This technique is much different from anything in this PDF guide, but will try to quickly explain a quick overview. Some details are beyond the scope of this guide.

Instead of splitting the kit down the middle, and deciding the height of the mics (Step 1 and Step 2), asymmetric instead starts out by placing an anchor microphone at the top of the drum kit.

This anchor mic is often above the snare or hi tom. The goal is to make sure this mic has a good balance of the kit. If your drummer has a loud hihat (Nearly all drummers will have a loud hihat), then this microphone will most likely pick up a lot of hihat, thus creating a problem and a challenge. I have pointed this mic toward the floor tom slightly and it helped to reduce the hihat and keep it from overwhelming the top overhead mic.

From here, we place another mic off to the side and quite low but at that same distance to the snare. It'll take a few adjustments to get both mics the same distance, and that's normal.

This techniques are ones like Glyn Johns, Weathervane (Brian McAtear and his crew) and Recorderman. Glyn Johns has a low secondary mic that picks up the low tom. It often creates perspective problems will the kick and the cymbals. Such as more kick attack in the secondary mic, and more kick lows in the anchor mic. Or some cymbals appearing to dim down in volume as they rock on the stand.

These perspective issues add to the challenge of the Glyn Johns technique. And perhaps that is apart of the sound.

Recorderman is where both mics are equal distances to both kick and snare. You have to create an “A” shape between the middle of the kick, and the snare, with the top of the “A” at the mic. You have to
pinch the string and move it back to find a second mic position.

Most of the time the second mic will be over the drummer's right shoulder, and the anchor mic will be above the kit. This technique works fairly well as both mics are up high, and a lot of issues are avoided that we see in the Glyn Johns.

The Weathervane method will seem like a crazy technique for a new engineer and you shouldn't try until you have practiced a few of the other techniques. But if you must, you can find a detailed video here:

https://www.youtube.com/watch?v=K9NjecFFoIQ

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