Techniques For Recording Drum Set

Part Three: Kick Drum

by Chris Munson

Overview

Now that some basics for capturing an overall sound have been covered, it is time to isolate the individual components of the kit. I have decided to begin with the kick drum because it illustrates a fundamental concept in sound. This is that the low-end provides the foundation and support for all of the other musical components. If a mix lacks bottom it seems thin and off balance. If too much bottom is present then the other elements are washed out. It is fairly common for this concept to be illustrated in terms of a pyramid with the low-end representing the foundation and the high-end representing the peak.

In terms of application, you might find yourself in a situation where there are only three microphones available for the kit. When this is the case, an engineer will use a pair of overheads and spot mic the kick. The kick mic is blended with the overheads to add enough bottom and give the kit (and mix) the low-end support it needs.

There are some basic concepts that you should be aware of when choosing a microphone for the kick. The first is something called proximity effect. Simply put, proximity effect is the increased bass response of a microphone that occurs when it is placed close to the sound source. Ribbon microphones are most susceptible to this effect and are often used to enhance the warmth and smoothness of the voice. This is why they were so popular with the crooners of the 1950s.

Unfortunately, a ribbon mic can be damaged by high sound pressure levels (spl) and is not typically used on kick drums (though this is not the case for more modern ribbon mics). The next best choice is a large diaphragm dynamic / capacitor microphone. A dynamic mic (as you may recall) has a slower response to sounds with quick and explosive attacks than condensers and therefore is less likely to overload when placed in front of something like the batter head of a kick drum.

Large diaphragms are ideal because of their ability to capture large wave forms. The human ear is capable of hearing a range of frequencies that spans from 20 Hz (hertz) to 20 kHz (kilohertz). Lower frequencies produce larger waveforms which is why you can hear bass being emitted from a car that is a block away from you. With that in mind, the warm and punchy tones of a kick drum can be found anywhere from 40 to 200 Hz. Some of the most common microphones used for the kick drum are the AKG D12, AKG D112, EV PL20 or RE20, and the Shure Beta 56.

Placement

There are essentially an infinite amount of options for mic placement. The most important thing to keep in mind is that you are satisfied with your kick sound before you even begin to think about

miking. No microphone or placement technique will turn something that sounds like a cardboard box into John Bohnam's kick.

You typically encounter two scenarios when miking a kick drum. They are a ported resonant head and a non-ported resonant. The port makes it possible to get the microphone inside the kick and really manipulate its placement. The non-ported head presents some other tonal possibilities though it's a little more difficult to get that super punch sound when you can't get inside the drum.

I will be using both an AKG D112 and an EV RE20 for the recorded examples. Additionally, I will use kicks with both ported and non-ported heads. The microphone positions will be as follows:

1. 1" from beater, dead center and 45 degrees off-axis from beater
2. Half the depth of the kick dead center and 45 degrees off-axis
3. Flush with port dead center and off-axis
4. 1" from resonant head (non-ported) dead center and 45 degrees of axis
5. 6" from resonant head (non-ported) dead center and 45 degrees of axis

RE20 Off Axis

D112 On Axis

What you will notice is that the further the mic is from the beater, the less punchy the sound is. This can be attributed to the proximity effect. Remember that you can further influence the sound of the kick by using muffling, changing heads, and changing beaters.

Try to avoid thinking of the different placement techniques as good or bad but instead in terms of right or wrong. For instance, the punchy , in-your-face sound you get from placing the microphone a certain way probably won't work on a jazz ballad. I find it beneficial to think about the overall sonic color or vibe of the track so that I am less inclined to fall back on my favorite placement technique and pick what is best for the song instead.

Chris Munson is currently the Director of Recording Arts at Eastern Kentucky University where he teaches courses in music technology and applied drum set. He has been a professional musician and audio engineer for over 15 years. Over that time he has recorded or performed with: Don Aliquo, David Amram, Darol Anger, Danny Barnes, David Carradine, Vassar Clements, Jeff Coffin, Joe Craven, Jerry Douglas, Tom Harrell, Jorma Kaukonen, Jon McEuen, Tim O'Brien, Greg Osby, Anders Osborne, Merl Saunders, Jamey Simons, and Trout Fishing in America. Albums he has appeared on have earned numerous awards including two Grammy nominations.