

ProSoundWeb EXPERT SERIES



OPTIMIZING MIKING OF THE MIGHTY KICK DRUM

Chapter 2 of 6: Drum Microphone Expert Series

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OPTIMIZING MIKING OF THE MIGHTY KICK DRUM

Microphone techniques for everything you wanted to know making it go “bang.” *By Mark Frink*

Although there are other conventions, it’s generally agreed that the kick drum goes into the first channel of the console, and for time immemorial, inordinate efforts have gone into tediously adjusting it. Sound check never really starts until after this first input has been tweaked to satisfaction.

The kick drum is the cornerstone of rock. It puts the pop in pop music and is the one input that holds it all together. It’s the heartbeat of rock ‘n’ roll. With most input channels, the goal is to accurately recreate the original sound, but with kick drum an ideal is constructed from the available material. Perhaps it’s in channel one because it defines “one.”

First Things First

If you want good sounding drums, the drums must first sound good. Though it sounds like a platitude, sound checks frequently grind to a halt while someone looks for a drum key. Lousy drums always provide lousy sound (garbage in, garbage out), but the same kit, properly tuned, sounds completely different.

You don't have to be a drummer to know how to tune drums, though it helps. However, plenty of drum techs are living proof that anyone can learn.

When foldback speakers began battling it out with Marshall stacks and Sunn Coliseums, taking the front head off the kick drum became a necessity to provide a degree of isolation and allow the mic to capture the attack of the beater hitting the head.

The use of a pillow to dampen the head began, no doubt by a sleepy drum tech, and as years went by, the art of the hole in the front head evolved.

There are three ways of setting up a kick drum: with heads on both sides, batter head only, or with a hole in the front head. The latter compromise has become the rule, as it provides access for mic placement, while retaining some benefits of the resonant head, and over time the hole has gotten smaller and moved away from the center.



Countless back-lounge discussions have been logged on this topic. It's generally agreed that anything larger than 6 inches (a roll of duct tape) releases too much air and performs like no head at all (other than to keep the pillow inside), and a hole in the center also releases too much pressure.

Cutting a hole with a utility knife can have disastrous results and is a job for the skilled or experienced. Heating a coffee can on a stove and pressing it into the head can melt a hole that's even and smooth. And in case you were wondering, the 4 o'clock position for an offset hole became traditional because a boom arm reaching across the head causes the weight of the mic to tighten the screw on the mic clip and keep the mic in position.

Batter head tension should be no more than a half-turn past taking the wrinkles out. The front head's tension affects the batter head, and should be slightly looser for the fullest sound.

The three ways of setting up kick drum heads.



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Over-dampening kills tone. Felt strips cause more trouble than good, as they keep the head from correctly tensioning. It's often best to only lightly dampen the heads, to control decay, and Drum Workshop makes an hour-glass-shaped pillow that's held in place with Velcro to lightly touch both heads.

Before even turning on the kick mic, do everyone a favor and listen up close. If it doesn't sound good acoustically, there's little that will make it sound great in the PA, short of replacing it with a sample. (Surely the next digital mixing console trick is a built-in Wendell Jr. that plays back the drum from last night's show or the drum from the record.)

Now hit the drum. The kick drum seems simple to play, but can seem mediocre during a line check with a tech or stagehand's foot at work, yet suddenly sounds great when the actual drummer shows up, as long as he plays it the way he will during the show.

Properly playing a kick drum takes a well-toned leg, built up from years of bouncing the heel. Maybe playing back a sample of a previous show's kick is a good idea until a real drummer arrives.

Time is frequently wasted turning knobs, when a twist of the mic stand's boom arm is what's really needed. While the engineer is wrestling with the first input, it's helpful to have an interested tech assist at the kit, by listening up close and standing by to adjust the drum pillow, mic angle, or simply offering suggestions about how it sounds.

Let's look at our mic options.

Legends

Kick drum mic choices have evolved over the years. In the beginning there were few alternatives and no "kick drum" mics. There were just vocal mics and instrument mics.

Eventually a few models emerged as favorites: the venerable Sennheiser MD 421, the solid EV RE20 and the exotic but fragile AKG D 12E.

The fallback was simply a Shure SM57, and in a pinch an SM58 worked equally well, as they're nearly identical. The old gaffe about the sound company with both kinds of mics: 58s and 57s was true back in the day, with the first exception being a special kick drum mic, where it does really matter.

The road-dog trick in the 1970s was to modify a 57 by taking the transformer out and connecting the capsule directly to the XLR, a ploy rediscovered by budget recording enthusiasts. This modification drops the gain by 10 dB—perfect for kick drum applications—while also removing the cheap transformer that saturates upon extreme SPL.

EQ'ing the kick drum is a skill with millions of man-hours invested, yet the simple truths are that mids must be cut, while lows and highs are boosted. General-purpose mics need a wide cut around 400 Hz. Indeed, in the 1980s, one reason 4-band fully parametric EQs were demanded for premium live consoles was that the secret to kick drum EQ was the celebrated “double-midrange-cut,” with boosts at 80 Hz and 2 kHz.

A single midrange cut employs a wider bandwidth that steals thump and click at its skirts. Few inputs needed four bands as badly as the kick, and this helped drive the sales of premium live consoles. Desks with swept mids, but fixed highs and lows, force one filter to be tuned as a low-mid cut, and the other to bring out the click, or to ‘put a point on it,’ in the vernacular.

Manufacturers have gotten caught up in “big mic” aesthetics, as users are easily invested with the false notion that bigger is better for a kick drum, or that a large diaphragm is better for low frequencies, which is only true in some cases for condensers—other factors really do play a part in determining how well a mics response is tailored for kick drum.

As such, there's a proliferation of sub-\$100 kick drum mics, and the old chestnut that ‘you get what you pay for’ really applies. I've rarely found a cheap mic I could recommend to pro users, while a quality microphone will serve its owner for years while retaining its value.

Quality modern kick drum mics are designed to get a sound engineer most of the way there before ever touching the EQ. The Audix D4 is one example, and I single it out because the company did such a great job on the D6, a second-generation cardioid kick drum mic with a tight low end and smooth contoured response.



The Audix D6 has a cardioid pattern for isolation and feedback control, and is available in black and silver anodized finishes.

We know that placing mics inside the kick drum offers a degree of isolation. The Randall May drum mic system permanently mounts a microphone inside a drum. An armature attaches to existing drum lug hardware inside the drum, with an XLR on the drum shell. No stand required.

You may have seen kits with this system without realizing it, because you can't see these mics. This is a standard option from DW Drums, as well as a few boutique custom shops.

Mounting the mic inside adds presence, increases isolation and reduces cross-talk, and also keeps the mic out of the way so it doesn't get hit or bumped. Most of the above mics are available as May installations. For the Shure SM57, May removes the transformer (sound familiar?) and stiffens the edge of its diaphragm to bring out the lows.

A few years ago May also introduced a "blender" to mix the balance of two kick mics for different tonal effects. While it's hard for engineers to allow musicians that kind of control at a gig, Jim Keltner's use of the system to blend two inside mics—one aimed at the batter and the other at the resonant head—shows that the ultimate application of the May system is to leave the front head intact. Those of you paying attention will be trying to put two boom arms in one hole at your next line check.



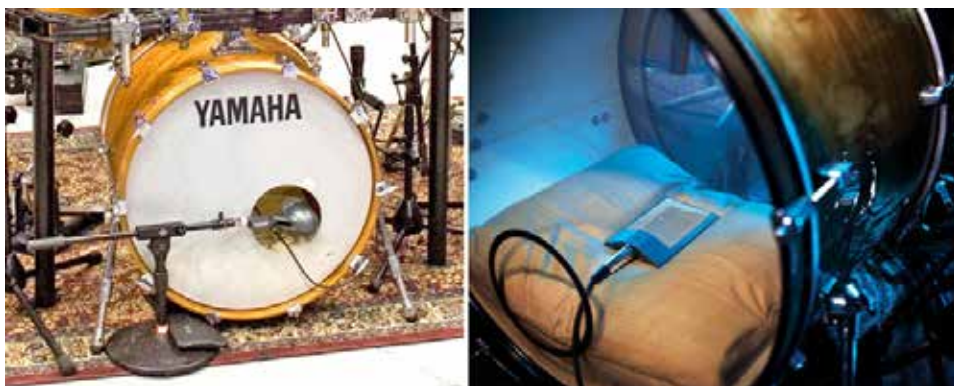
Randall May drum mic system.

The 1980s saw the introduction of the Shure SM91 (now the Beta 91), intended as a boundary mic for similar applications as Crown PZM designs. It crossed over to Broadway as a foot-mic, where it was discovered to make a full-sounding kick mic in tight orchestra pits, where mic stands are easily humped. Engineers had been adding a second snare mic for years, and besides allowing two channels on festival input lists for double-kick drum kits, two mics in the same kick drum wasn't much of a stretch.

Though the 91 doesn't need a stand, it bounces around in some drums, so custom foam pedestals are often carved to isolate and protect them. Others are content to just put them on the "drum pillow." While its low frequency response is hemispherical, it becomes directional at higher frequencies, so its orientation affects the amount of attack.

Other manufacturers have offered boundary mics with varying degrees of success. Products intended for conference table applications don't always stand up to the rigors of the mighty kick. However, more recently, a few have come up with application specific boundary mics with high headroom and tailored frequency response.

Studio folks will tell you that a great technique is using a large-diaphragm condenser (LDC) several feet away, often constructing a tunnel of sound, deadened to maintain isolation. For live gigs this has obvious limitations, combined with the fact that they usually get increasingly omnidirectional at low frequencies.



A stand-mounted mic in the hole and a boundary mic completely inside the kick on a pillow.

A while back, Yamaha introduced the SKRM SubKick, a 10-inch drum shell with a 6.5-inch woofer inside. This kick drum miking idea is borrowed from the old-school studio approach of using the woofer from a Yamaha NS10 near-field studio monitor (usually available because its tweeter was blown) as a microphone for the kick drum.

Different results are obtained depending on whether the woofer is in the NS10 cabinet to dampen its response, or is in “free-air.” The frequency response of the woofer naturally rolls off the highs, but this technique has always been used to compliment another, more traditional miking technique, providing a fatness and thickening that complements the transient of a condenser. It’s not for everyone, but many think it’s “da bomb.”

Now that we’ve established two inputs as standard, the next frontier is obvious. Someone recently joked that it’s about time we added a third input, but I agree wholeheartedly.



Yamaha SKRM SubKick.

We're best able to evaluate various combinations and new microphone choices by simply allowing for a third experimental kick drum mic in the input list. You may find that you can replace the two mics you've been using with a single mic that works better. Alternatively, you may prefer some two-mic combination to what you've used all along.

How else are you going to find out unless you put some play time and space into the daily grind? Most engineers plan an hour between line check and sound check. Why not invest a little of that time every day to learn more about microphones that make it go bang!

Mark Frink is a veteran touring sound engineer who has mixed monitors for numerous top artists, and he's also a noted free-lance tech writer.

About Audix Corporation

Audix is a U.S. manufacturer of high-quality dynamic and condenser microphones, as well as wireless microphone systems for the live sound, recording, and installation markets. From concept to completion, Audix's on-site research and development team combined with an in-house manufacturing facility, enable them to proudly provide products from their headquarters in Wilsonville, Oregon.

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