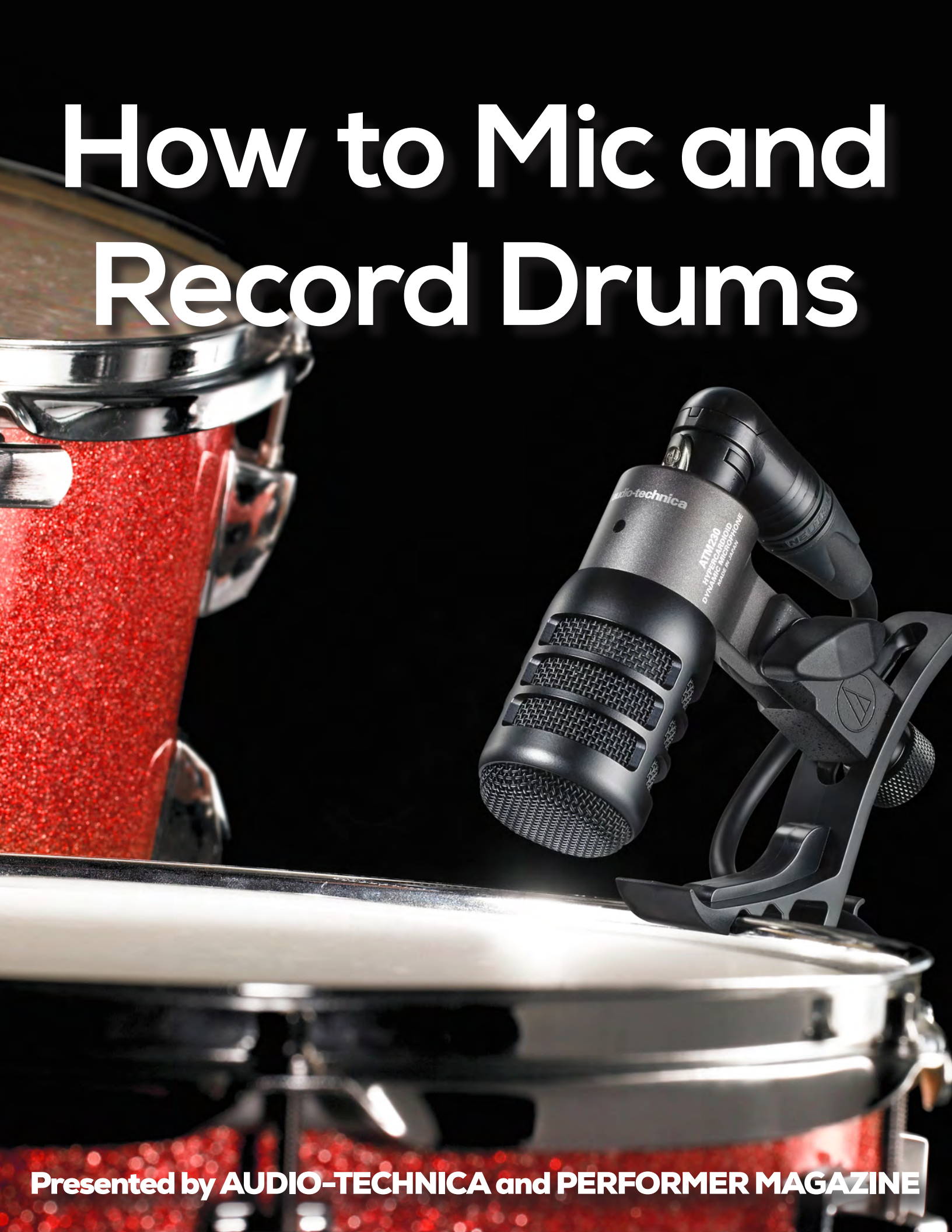
How to Mic and Record Drums



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SECTIONS

PART 1

The Best Drum Mics For Your Home Studio

Welcome to the first in a four-part series that will provide real-world advice for setting up your home recording studio to record a full drum kit, co-presented by Performer Magazine and Audio-Technica. In this installment, we'll take a closer look at the best microphones for recording drums in your home studio, what kinds of specific microphones are ideal on each part of the drum kit, plus some basic tips for recording the cleanest drum tracks possible. In parts 2-4, we'll go into more detail about specific drum miking techniques for snare, kick, cymbals, hi-hats, overheads and even adding effects like reverb, delay, room ambience and gating to your mix.

RECORDING DRUMS IN YOUR HOME STUDIO

Recording studios have come a long way since the days of multi-million dollar complexes with 30-foot long consoles and flying faders. It's now possible to record professional-quality albums at home, with gear that costs a fraction of what those old commercial studios paid. With that in mind, many home studio users shudder at the thought of recording drums.

With guitars, you're typically placing an instrument mic on the amp's speaker or one of the speakers in the guitarist's cabinet, positioning it where it sounds best for your application, and you're on your way. Vocals are fairly simple, as well. Place the singer in front of your mic of choice, and that's half the battle. Granted, that's an oversimplified explanation, but not when you compare it to the daunting task of recording drums.

Drums…well, there's just a lot more of them. And that makes things tricky. Sounds pressure levels are an issue; drums are loud and full of attack. Bleed is an issue; again, drums are LOUD and full of attack (notice a pattern here?) And oftentimes, it can be intimidating to know just what the best mics are for a full drum set, how many mics you'll need to capture the performance

in the best way for your mix, and how to position the mics on each individual drum in the best manner possible to get the sounds you're after.

In short, no matter what room you're in (home studio, commercial space, even on stage), you'll want to mic each part of the kit individually so that you can capture their unique tonal characteristics, and so that you can balance out the entire drum set in the mix by adjusting certain parts, if need be.

THE BEST MIC FOR KICK DRUMS

Kick drums can be difficult to get right in the studio, but generally speaking, you're going to want to place one mic inside, for two specific reasons. One, it helps capture the natural attack of the kick drum, and it also helps isolate and mitigate bleed from other parts of the kit. You'll also likely want to place a close mic outside, in front of the head.

Inside, we recommend a large dynamic mic like the Audio-Technica ATM250, which will help nail the "punch" that you'll typically want from the kick drum. Outside the head, a large-diaphragm cardioid condenser can help enhance the bottom-end of the spectrum to round out the "attack" being picked up by the dynamic mic inside. Think of them as complementary buddies designed to work in tandem to get the best kick sound possible. A great choice for this application would be the AT4047/SV.

THE BEST MIC FOR HI-HATS

Hi-hats occupy a unique sonic space in your drum mix, at times splashy, percussive and (sometimes) top-heavy in the frequency range. For hi-hats, we feel the best mic is a side-address designed cardioid condenser instrument mic, like the ATM450. The side-address design makes placement on the source easy, and the high-pass filter and pad can be engaged to ease some of the bleed coming through from, say a snare or the kick drum (this is true even for non lead-footed drummers).

THE BEST MIC FOR SNARE DRUMS

Snare is oftentimes all about attack, and capturing that accurately without bleed can be challenging. One of the ways to get the best snare sound is to use two mics, one set up above and one below the head. For the top, the best mic for the job is a hypercardioid dynamic instrument mic, like the ATM650 which is designed for capturing loud attacks at close distances, without clipping or distortion. If you're also bottom-miking, you can choose to use another dynamic instrument mic, or a condenser with high SPL. You could, in fact, place another ATM450 like

right: ATM-230 microphone

the one you used on hi-hats, under the snare, with the high-pass filter and pad engaged in this situation, as well. Again, this'll help combat any bleed from other parts of the kit.

PRO TIP: make sure the bottom mic is flipped out of phase at the preamp stage so that you're not canceling out waves and ending up with an unnaturally "thin" snare attack in the mix.

THE BEST MIC FOR TOMS

If you use the wrong mic on toms, they have a tendency to be boomy and muddy up an otherwise "tight" and "percussive" drum sound. We'll get into placement and technique in future installments, but using good overheads arranged properly will yield nice results, especially when mixed with closer-miked toms near the rack. For overheads, we'd recommend going with the ATM450 again, or a similar pair of instrument condenser mics designed for high sound pressure level applications.

For closer miking, the best options would be something like the ATM230. Why? Because its capsule is designed for high SPL scenarios (like, you guessed it, drums) and because the hypercardioid design rounds out the low-end while also focusing right on the sound source (we're gonna sound like a broken record, but this aids in keeping bleed-through down to a minimum). Another well-balanced mic that would be great for toms, especially, is the ATM350a, which handily enough comes in a kit with a nice gooseneck mounting system perfect for drums (the ATM350D package).

THE BEST MICS FOR CYMBALS

Splashy and sibilant, cymbals also present a challenge during the mix if you've used the wrong mic during your tracking session. A well-position condenser mic will handle high SPL situations like a ride, but you may also want to capture cymbals with your overhead setup. The trusty, and versatile ATM450s can assist here, as they're simply great for overhead applications. Just remember that closer positioning to your cymbals will capture less of the overall kit, while a more elevated position can round out the entire drum set for a balanced "overview" of the kit. You might find that handy depending on the style of music. For tight, syncopated prog and metal, you might not need it. For soul, R&B and more retro sounding material, try moving the mics further from the source and see how that suits the session.

THE BEST ROOM MICS FOR DRUMS

We haven't talked much about the room yet; we'll get to that in later installments. But no matter if you're in a spacious, cavernous hall or a tight, cramped bedroom space, capturing the "room" can add an interesting element to your overall drum mix or some much-needed ambience that might otherwise be missing from close-miking your drums individually, out-of-context with how they sound as a cohesive unit. Since this is a much larger topic, stay tuned for our next installment for much more detail on room miking techniques and the best mics for the job.

CLOSING THOUGHTS

Now, keep in mind this is simply a primer to get you thinking about the best drum mics for your studio; these are just some recommendations for the basics you'll need to get started. For a more serious setup, you can add additional mics to capture your drums from different angles, use different types of mics to capture more unique percussive tones coming from the kit than what you'd typically aim for, or even try something totally off-the-wall when it comes to miking a full drum kit.

We hope this installment at least gets you familiar with the quantity and best types of mics if you do choose to venture into the world of recording drums in your own studio. Stay tuned for upcoming parts of the series that will focus further on practical microphone setup and recording techniques for each piece of the kit.

opposite:
ATM-350d
microphone

PART 2

How to Record Drums: Snare and Kick Drums

THE BEST MICROPHONES FOR RECORDING SNARE DRUMS

As we mentioned in part one of our series on recording drums, the snare is all about attack, and capturing that attack is the key to a (traditional) snare sound. We recommend good quality dynamic instrument microphones, or condenser microphones with high SPL ratings to really get the "thwack" attack that will form the rhythmic punch of your track. The better the mic is at handling the initial loud hit of the snare, the less likely you'll be pushing your preamps into the red and causing non-musical, unwanted distortion or clipping in your drum mix. If you're recording to tape, though, you can always try experimenting with a slight push into tape saturation; you may find that rock drums benefit greatly being "pushed" a tad, using the analog tape medium as a musical "glue" to hold a slightly hotter drum mix together in an aurally pleasing way.

POSITIONING MICROPHONES AND TECHNIQUES TO RECORD SNARE DRUMS

Here are some tips from our friends at Audio-Technica on snare drum recording techniques:

1. Try using two mics on the snare, one above and one below. Above, we'd recommend a hypercardioid dynamic instrument mic, like the ATM650. This will capture the snare's attack without clipping due to the high attack volume. On the bottom, as mentioned previously, you can choose to use another dynamic instrument mic or go with a nice condenser that's spec'd at high SPL.

PRO TIP: make sure the bottom mic is flipped out of phase at the preamp stage so that you're not canceling out waves and ending up with an unnaturally "thin" snare attack in the mix.

2. As far as positioning goes, get as close as possible without clipping; the thing to avoid is a mic placed too far from the snare, as you'll not only lose the attack you're seeking, but more troublesome will be the bleed from your hi-hat, toms and cymbals that'll be picked up by the mic and muddy your mix. Try to position the top microphone between your hi-hat and rack toms, and remember that the closer you get to the snare head, the boomier and more low-end frequency accentuation can occur. To combat this, you can angle the microphone closer to the middle of the snare head, which will help accentuate the attack and relieve some of this low-end pickup.

3. For the bottom mic (if you plan on going this route), you'll again want to place the microphone as close to the bottom of the snare (and centered) as possible to minimize any potential bleed from the other parts of the kit, but not so close that it's touching the actual drum.

4. Feel free to experiment. You could try top-miking with a single condenser and opt not to use any dynamic instrument mics at all. Some-

opposite: ATM-230 microphone

times this might suit a more dynamic or quiet playing style, such as jazz with brushes, as it'll enable you to capture a slightly brighter top-end and open up your snare track in the mix.

THE BEST MICROPHONES FOR RECORDING KICK DRUMS

We called the snare the rhythmic punch of your drum track; conversely, the kick drum is the heart beat of your track. As stated in part one of this series, kick drums can be deceptively tricky to record properly in the studio. If possible, we recommend using a large dynamic instrument mic inside the shell, for two specific reasons. First, it aids in capturing the organic "thump" and pound of the kick drum, plus it keeps the microphone from picking up other parts of the kit. Bleed is not something you want in a tight bass drum sound, so do everything you can to isolate the inside mic, and you'll help avoid that issue when it comes time to mix. You'll also likely want to place a close mic outside, in front of the head, to help round out the sound and get the fullest kick possible for mixing.

POSITIONING MICROPHONES AND TECHNIQUES TO RECORD KICK DRUMS

Here are some additional tips from our friends at Audio-Technica on kick drum recording techniques:

1. For the inside mic, dead-center placement is actually not optimal. An off-center approach to placement will assist in capturing a stronger low-end kick.

2. Feel free to experiment with how close and far you position this inside mic from the head; this will alter attack and low-end, so adjust to taste.

3. If you're placing a secondary mic in front of the resonant head, try keeping it away from the direct center of the hole so it's not picking up too much of the batter head.

4. You can opt for a dual-element cardioid instrument microphone, like the AE2500, which will capture the top end attack with its dynamic element, and the lower frequencies and thump with the condenser portion.

PART 3

How to Record Drums: Miking Overhead Drums and Cymbals

below:
ATM-450 microphone on hi-hats

TIPS FOR MIKING OVERHEAD DRUMS

One practical reason professionals will place a pair of overhead mics above a drum set, either during tracking sessions or live gigs, is to capture a stereo image of the full kit, that can then be panned to left and right speakers in the mix. This aids in capturing the "fullness" of the entire drum set, which can be further complemented by individual miking on snares, toms, cymbals, etc.

Our friends at Audio-Technica have a few handy tips for overhead miking techniques.

1. Dual, Spaced-Apart Cardioid Condensers. Combining a set of AT4050's above your kit gives you some options for capturing the stereo image in an easily adjustable manner. Keeping both mics the same distance from the snare will be key, but you can experiment with overall height to play with the balance of the sound, and can position the mics closer or farther apart from one another to affect the overall stereo imaging. More distance usually equates to a wider image, all things being equal.

2. An X-Y Overhead Setup. Alternatively, you could try an X-Y configuration with your overhead mic setup. Use two cardioid condensers with the elements as tightly together as you can get them at a 90-degree angle. Keeping this arrangement centered above the snare will help keep it (the snare, that is) focused in your stereo image, and making sure the entire configuration is high enough will eliminate most phase issues that can arise from splashy cymbals passing through the field.

3. ORTF. Similar to the set up above, you'll use a pair of cardioid condenser mics, this time spaced slightly apart and not at a 90-degree angle like the X-Y configuration, but rather at a 110-degree angle from one another.

TIPS FOR MIKING HI-HATS

Audio-Technica also has a number of helpful tips for miking hi-hats. Here are a few of our favorites:

1. Positioning. If you place the mic on the outside edge of the hi-hat, you kill two birds with one stone. For starters, you'll be keeping the mic out of the way of the drummer, which is always a good thing. And second, you'll help isolate the hi-hat from the rest of the kit, which can be helpful to either eliminate bleed and/or raise/lower the hi-hats themselves in the overall mix, independently of the overall balance.

2. This might seem like a no-brainer, but make sure the mike is positioned high enough above the hi-hats so as not to interfere with the opening and closing. You'd be surprised how many times we see mics placed too close to unopened hi-hats at live gigs, only to be knocked over the second the drummer starts using the pedal to open and close them. Oops! Something that can easily be avoided.

3. The closer your mic is to the bell, the more focused the sound will be. That goes for live and studio situations.

4. If you are placing the mic on the outside edge of your hi-hats, experiment with non-parallel positioning. When you close the hi-hats using the foot pedal, there's a lot of air being pushed around, and a big attack like that can spike or possibly damage fragile diaphragms, especially in smaller condenser mics.

TIPS FOR MIKING RIDE CYMBALS

And lastly, we'll close out this installment with a few more practical techniques for miking your ride cymbals, again courtesy of our friends at Audio-Technica.

1. Positioning/Placement. Like most parts of the kit, you'll want to place the mic close to the source to eliminate bleed; just be careful with the ride because a mic positioned to close to the cymbal can add unwanted low-end boom that will muddy up a mix. Typically, you'll want to accentuate the percussive nature of the cymbal, so placing the mic about halfway between the edge of the cymbal and the bell can aid in this goal. Keep in mind your overheads will pick up a lot of the slack when it comes to low-end fullness, so focus on capturing the attack for elements like the ride.

2. Stereo Imaging. Stereo placement is crucial to a great drum mix. Phil Spector might not agree, but hey, it's not the '60s anymore. Placing the elements of your kit properly in the left, right and (phantom) center channels will make the drums sit well amongst the rest of your mix, and will spread out and "de-congest" the overall balance of the track, as opposed to drums that are centered down the middle with no thought to proper spatial placement and panning. In short, once you find the right placement of the ride mic, use it to complement your overheads in the mix, and experiment with panning the ride individually to see where that attack sits best in your overall drum mix.

PART 4

How to Record Drums: Gated Reverb, Compression and Room Ambiance

left:
ATM-650 microphone

GATED REVERB FOR DRUMS

The "gated" drum sound so closely identified with the 1980s was, as legend has it, discovered by accident as Phil Collins was tracking drum parts for the Peter Gabriel album often referred to as Melt (though it's really self-titled). Now, the truth behind that is up for debate -- the gated reverb sound was actually used on an XTC record as early as 1979, a year before Gabriel's album -- but what remains is an instantly identifiable sonic signature that you can recreate, even in a project or home studio environment.

The gated reverb sound is used as an effect to really make the drums sound punchy and clean, though a combination of employing reverb and noise gates. In the early days, this would have been achieved in a large commercial studio, as you needed a big live room with lots of natural reverberation and reflections for the effect to truly work properly. Nowadays, though, we can get a similar sound without the need for a live room.

To start, close mic the drums you'll be applying the effect to. Again, no need to worry about room mics or ambient mics, since in a home or proj-

ect studio, we'll use hardware or software effects to create our reverb.

Take the audio you're close-miking and run that into your reverb unit (either hardware or digital), then route that to your noise gate's signal input.

Take the same close-miked audio from the step above, and feed that right into your noise gate's key input.

From there, it's just a matter of mixing to taste. You can take both the unprocessed (dry) and processed (wet) signals and combine them how you see fit for the style of the track. Experiment with each, and you'll find what works best.

Typically, the effect is really used to accentuate the oomph of the snare drum (and secondarily, the kick). It's a powerful impact when you hear it done well, and doesn't necessarily have to be an "80s sound" if placed in a contemporary setting.

BONUS TIP: you can use a similar routing set-up for gigs, too, if you want to recreate the desired sound from your recorded tracks in a live setting.

COMPRESSION TIPS FOR DRUM RECORDINGS

Compression is one of those often-misunderstood terms when it comes to the studio. In a nutshell, audio compression (depending on your settings) reduces the signal (volume) of the loudest passages of your recording, and amplifies the quiet passages, so that the overall balance of the sound is somewhat "squished," albeit in a musical way. Compression is one of the key tools used in the mastering stage of your music, and can be applied tastefully to your recorded drum tracks to great effect, as well, even before mastering.

One cool technique in the studio is to employ compression by mixing a dry signal with a compressed one to help subtly thicken the sound.

Start with your basic drum track. In your DAW, copy that to a new track so that you have two identical versions of your drums.

Next, you can either route that to a hardware compressor unit and then back into the DAW, or more simply use a compression plug-in within your DAW to affect the attack, release and threshold parameters to taste. A little goes a long way, though we do recommend slowing down the attack considerably.

Once you have the copied track where you want it, compression-wise, mix both versions together to taste. You'll likely want to use this as a subtler effect in your mix, so the duplicated track with compression will typically end up a bit lower in the mix; but again, it's all up to taste.

USING THE ROOM AS AN EFFECT ON YOUR DRUM RECORDINGS

We focus so much on close-miking techniques to really capture the punch of the snare, or attack of the cymbals, that we often overlook room miking as an effect on its own.

Back before mega-huge consoles and unlimited virtual tracks, drums were often recorded with a few simple room mics, in (gasp!) mono. And while you're likely not putting out music in mono, try soloing your room mics during your drum tracking sessions to get a feel for what you're capturing. One thing you can do is employ that "room" sound you're picking up from your overhead mics as an effect during quieter passages of your songs.

Try this: let's say a verse is really quiet and stripped back, compared to the rest of the song (dynamics ftw!); during those parts, experiment with mixing in the drum sound captured by your ambient or room mics, and utilize phase-shifter plug-ins or hardware effects to add a subtle "swirl" to the sound. What this can do is make the drum track feel more distant (in a good way) and textured in an interesting way, sonically. We recommend using very slow settings when it comes to phasers and flanger effects, as too much will make things sound like a jet engine taking off. Go for subtlety and you might be surprised at how interesting it can be when laid into a track's quieter moments.

CLOSING THOUGHTS

Now, keep in mind this is simply a primer to get you thinking about how to record drums in your studio, and how to apply some common effects on your drum tracks for more interesting mixes. We hope this installment provides some helpful tips and we recommend you check out our additional installments in the series, where we've tackled miking overheads and cymbals, recording snares and kick drums, and introduced you to the best types of mics to record your entire kit.

And be sure to check out the entire range of Audio-Technica instrument microphones at

www.audio-technica.com