



Practical Drum Kit Miking, Part 1

Tips & Tricks

Technique : Recording / Mixing

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The ancient art of drum-kit miking is a black art as far as many project studio owners are concerned. Yet, as BENEDICT GRANT explains in the first of this two-part series, there's no need to let the kit beat you...

Many songwriters and home studio engineers lack confidence in their ability to record a drum kit at home or in an untreated room: this has condemned many songs which would have benefited from the live feel of real drums to the metronomic tyranny of the beat box. The reality is that a good live drum sound can be achieved in a small, untreated room, with just a few inexpensive microphones, providing that care is taken with the preparation of the kit and with microphone placement.

BE PREPARED

Tuning and preparation of the drum kit is a vital first step towards obtaining a good sound: a kit which sounds fine for gigs and rehearsals may show all manner of imperfections under the harsh scrutiny of the studio monitors. Stage one is to eliminate clicks, rattles and buzzes. The bass drum pedal is often a culprit. It must be securely attached to the drum shell, and should be oiled if it squeaks. Any of the metal fixings on the kit which rattle should be tightened or damped with Blu-Tack.

Next, each drum must be tuned by adjusting the tension of its skin. This should be tightened evenly, and you should check by tapping the skin round its perimeter, ensuring that the pitch is constant. Experiment with different tuning pitches on the bass drum: you'll be surprised at how much this can affect the feel of a track. If you're using double-headed toms, ensure that both heads are tuned to the same pitch.

A powerful and well-defined sound is more easily achieved if the bass drum has a hole cut in the front skin. Some drummers cut a small hole, of seven inches or so in diameter. This can make the rest of the skin resonate, so I prefer to cut a much larger hole, leaving just an inch or two of the skin around the perimeter. It is not advisable to remove the front head altogether, because the drum shell would then be subjected to uneven stresses, with the potential for damage and warping.

Any drum which rings or resonates to excess should be damped, by gaffa-taping a small pad of paper tissue or fabric to the drum skin close to the edge. Don't damp a part of the drum that the drummer will want to hit! A cushion or pillow should be placed inside the bottom of the bass drum, about half an inch away from the head, to reduce unwanted resonances. This can be moved into contact with the skin, if required, to damp it further.

The most important parts of the drum kit are the bass and snare drums: both must give clear, positive beats which decay before the next beat if a blurred sound is to be avoided. The sound of the bass drum is also determined by the material of the beater: wood gives a modern, snappy sound; leather and felt produce more of a thud, better suited to a rock style. A 'black dot' drum skin gives a harder, better-defined beat. Try taping a beer mat onto the skin at the point where it is struck in order to obtain a similar effect.

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Tuning the snare drum high gives a high, contemporary sound, whereas a lower tuning is more suited to rock music. The lower head should be slightly looser than the batter head. Tuning pitch also determines the decay time for the drum sound, which is longer for a low pitch. For fast tracks, it may be necessary to raise the tuning or increase the damping so that the drum does not resonate from one beat to the next. (This creates a muddy effect.) The snares should be tensioned so that they rattle crisply when they are on and the drum is struck, but do not buzz or rattle in sympathy with any other part of the kit. If necessary, the wires can be damped by applying a little gaffa tape to them, close to the edge of the drum, though inevitably you have to live with some rattle. Using a snare gate can help keep this under control.

Tom-toms often have an excessive ring, which should be damped as described previously, rather than by

using the drums' internal dampers, which apply pressure to the rear of the skin and thus affect the tuning.

It's important not to damp the kit excessively -- you want it to sound like the dynamic powerhouse of the band, rather than a lifeless accumulation of soggy cardboard boxes.

MIKING THE KIT

The most straightforward way to mic a kit is with a single pair of overhead microphones. This technique gives a very natural sound, with excellent stereo imaging, but it limits the possibilities for adjusting the drum sound during mixdown. I find this technique very effective for jazz and for ambient music. It is least successful for pop and rock.

Start by positioning the microphones at a height of six feet and about five feet distant from the kit, and experiment with moving them further back until a good, well-balanced sound is achieved. If you are working in a room which has a pleasant live sound, try moving the microphones further back, in order to increase the amount of reverb the mics pick up from the room. Listen to the sound with the mics in different positions. Note that it's wise to err on the side of caution and not record a sound which is too reverberant: you can always add more reverb using a digital processor, but it is impossible to reduce the amount of reverb on a recorded sound.

It's best to use condenser mics or high-quality dynamics: Tandy pressure zone microphones (PZMs) make good budget overheads, and can be gaffa-taped to the mic stands. Reasonable results can be obtained with Shure SM57s, which are fine and relatively inexpensive dynamic mics. Almost any condenser mic (AKG C1000, C451, C414) will perform admirably as an overhead. I have used this technique to record drums for a five-piece jazz group, using a Calrec Soundfield stereo microphone as my overhead.

A very worthwhile improvement on this method is to add a third mic for the bass drum. This allows the balance between the bass drum and the rest of the kit to be adjusted during mixdown, and enables the bass drum sound, which often requires processing, to be treated separately. Many bands, including Led Zeppelin and The Beatles, used this setup to good effect.

CLOSE MIKING

Most commercial recordings are now made using a multi-microphone setup. Each instrument in the kit has an individual microphone, which allows the balance between individual drums to be adjusted by the engineer, and for each signal to be processed and equalised separately. For this technique to be effective, good separation must be achieved between microphones, so that each picks up the sound from the drum to which it is assigned, with the minimum possible bleed from adjacent drums.

It is not necessary to mic every single drum: bass and snare constitute the powerhouse of the kit and are the most important. The hi-hat bleeds through onto the other mics to such an extent that a separate mic is often redundant, and the cymbals are best picked up on a single pair of overhead microphones.

The bass drum is usually recorded with a dynamic mic. This should be fixed to a short boom stand, and positioned inside the drum about two or three inches from the skin and somewhat off-centre. I incline the mic downwards at about 30 degrees, and pointing away from the floor tom. The AKG D12 and Sennheiser MD421 have been popular choices for decades. A Shure SM57 works well on the bass drum, as does their new Beta 52. I have heard of a PZM being employed, resting on the pillow in the drum. Most condenser microphones will produce a very fine sound but I feel that they are wasted on the bass drum, and I prefer the slightly fatter sound of a large-diaphragm dynamic like a D12. If you do use a condenser mic, switch the attenuator pad in, to prevent the mic distorting with the high sound-pressure level.

The snare drum is one of the most important elements of the kit, and in order to maximise processing options during mixing, it is important to achieve the greatest possible separation. This is difficult because of the snare's proximity to the hi-hat and toms. I place the mic just an inch or two above the batter head, pointing away from the hi-hat, which is always the worst source of overspill. It should not point towards any of the toms, nor should it be located where the drummer is likely to hit it.

I generally choose a dynamic mic such as an SM58 or Beyer 201, both of which are quite directional -- this aids separation. Condensers are equally effective: the AKG C1000, C451/CK1, and Neumann KM84 all perform well, and tend to give a brighter sound than a dynamic.

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A condenser mic is most suitable for the crisp, bright sound of the hi-hat. The KM84, C451 and C1000 all perform admirably, as does the AKG C414 for those with heavy wallets. I position the mic about three inches away from the upper cymbal, pointing away from the snare drum in order to maximise separation. A crisp, hissy sound can be achieved by miking the edge of the cymbal, whereas placing the mic closer to the centre produces a more metallic sound, emphasising the click of the stick. It isn't always necessary to mic the hi-hat separately, because it is picked up so clearly by the overheads, as well as spilling over onto the snare mic.

The toms can be miked with most good dynamic or condenser microphones. The SM57 is a popular choice, but I often use AKG C1000s, which give a crisper sound. I position them two or three inches above the skins, angled at about 30 degrees. Toms are rarely subjected to drastic processing, so attaining good separation is not vital. Indeed, a small amount of overspill on the tom mics can help to give a live feel to the recorded sound.

Two overhead mics provide the main sound pickup for the cymbals, as well as picking up sound from all the other instruments in the kit, to give cohesive stereo imaging to the kit as a whole and add some ambience. Condenser mics are best suited to the demanding task of capturing the exceptionally wide frequency range of the cymbals. If you are not constrained by budget, AKG C414s or Neuman U87/89s are splendid. However cheaper mics, such as the AKG C1000, can perform admirably, and I have achieved results I am proud of using PZMs. Overhead mics are generally positioned just behind the drummer, at a height of about six feet, pointing down towards the cymbals.

If your microphone collection does not permit separate miking of the toms, they can usually be picked up adequately on the overheads. In this situation, it's possible to adjust the level balance between the cymbals and toms by adjusting the height of the cymbals, and also by altering the position of the overheads, so that the mics pick up relatively more or less of the tom sound, relative to the cymbals.

Where the drums are being recorded in a reverberant, live-sounding room, experiment with placing two more microphones at a distance from the kit to capture the ambience of the room. PZMs fixed to the wall can be very effective.

OTHER PERCUSSION INSTRUMENTS

There are many percussion instruments which do not form part of a drum kit, but which will sometimes be encountered in the studio. Tuned percussion instruments such as xylophones, glockenspiels, marimbas and tubular bells should be recorded from above, preferably using a good condenser mic (AKG C414 or C1000, for example). Because the sound does not emanate from one point, but from the individual bars or tubes of the instrument, it is important to listen to the sound and take care to place the microphone in a position where it picks up the sound evenly. If a single microphone is used, try positioning it between 18 inches and three feet away from the bars. Where the instrument features prominently in the song, I tend to record in stereo, with two microphones spaced slightly apart. A similar technique can be applied to any other instrument which 'tinkles' or has a significant high-frequency content, such as bell tree, triangle, or rainstick. I find, when recording bass percussion instruments, including timpani, that a fuller, more rounded sound can be captured if the mics are placed at a distance of five feet or more. A good dynamic mic, such as a Sennheiser MD441, may be used instead of a condenser.

SUMMARY

It's important to realise that every drum kit is different and sounds different, and that there is no single correct technique for miking up. The suggestions in this article are the result of many years of practice, experimentation, and chatting with other engineers, as well as my own taste. Next month, in the concluding part of this short series, I'll be moving on to recording and mixing the well-miked kit. Meanwhile, you should feel free to experiment with the resources you have available, to get the most appropriate sound for the track you're recording.

BONUS DRUM TIPS

- Many drum shops sell Moon Gel, a sticky substance not unlike chewing gum, which is extremely effective for damping drum skins; you simply tear off a small lump and stick it on the offending skin. It leaves no trace when removed, and can be re-used.
- Make sure that mics and stands are well away from the drummer's strike zones. Also, to avoid unwanted mechanical noise, don't let the mic stands touch the drums or drum stands.
- Try to get the best sound you can by changing mics or moving mics around, before you resort to EQ.
- If there is too much spill from the crash or ride cymbals in the tom-tom mics, try miking the toms from underneath.
- Always evaluate the kit sound with the same drummer as the one you'll be recording. The same kit can sound totally different when played by another drummer.
- Remove boomy resonances from toms by damping them, using small pads of cloth or tissue gaffa-taped to the heads. Lay a pillow inside the bass drum resting gently against the back head.
- If you don't have a dedicated kick drum mic, experiment with what mics you do have, as the chances are that some will do the job noticeably better than others. Try to use mics with similar characteristics on all the toms.

LIVE & KICKING

Drums sound best in a bright, reverberant space with lots of hard surfaces: the modern trend is for a very live sound, and many studios have 'live' rooms (often with stone walls) specifically designed for drum recording. Personal experience shows that an empty garage can make an excellent drum room. If you don't have a suitable live room, drums can be recorded just as effectively in a living room, with ambience added using a digital reverb. *Thanks to Steve Kent at Denmark Street Studios for allowing the use of the studio for the photos, and Jackie at the Drum Cellar in Denmark Street for the use of the cymbals.*

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