

technique

mixing
drums

drum major

MIXING MULTITRACKED DRUMS

With drum machines and samplers becoming increasingly prominent in music production, mixing real drums is becoming something of a lost art. **Paul White** explains the basics of this important mixing skill, and shares some secrets on how to get the best drum sound.



In the world of synths and samplers, we take acoustic separation for granted, but when it comes to mixing acoustic drums, things are very different because of the usual way in which a drum kit is miked up. Normally pop productions use close mics for each drum, a pair of overheads to capture the overall kit sound and room ambience in stereo, and often a separate hi-hat mic.

The first thing you notice when you play back recordings of real drum kits is that each mic will have picked up more than just the sound of a single drum or cymbal. Obviously, the overhead mics *should* have picked up a bit of everything, but you'll probably find that there is considerable spill from the whole kit on even the close mics. In fact, if the drums were recorded at a live gig or in a small studio where the band all played together, there will also be spill from the other instruments to contend with as well. While spill can lend a sense of coherence to the complete sound, and is not necessarily a problem in its own right, it can cause real problems when you come to mix if you need to control the balance and tone of the drum kit. So how do you obtain a decent amount of control over individual drum sounds while also keeping a convincing overall kit sound?

Kicking Off

Let's concentrate on the kick drum first. The close mic will include spill from the snare drum and the toms, so using a gate to clean it up will usually be a good first step. Drums need fast attack-time settings, because of their percussive nature, though this setting can also have a beneficial side-effect: if a gate with a very fast attack time is used, the chopping effect that the gate has on the drum's waveform as it opens can give the sound a little extra definition. Set the gate release so that it closes fully as soon as the sound has finished — if you set it too long, the drum sound will be followed by a trail of spill, though if it's too short then the natural decay of the drum will be lost. In addition to killing spill, setting a suitable release time can also control any excessive ringing in the drum head or shell. If the gate

insists on triggering from other drum sounds as well as the kick drum, use a frequency-conscious gate and shave a little top end off the signal feeding the side chain.

At this point, the kick drum will probably sound quite unnatural when heard in isolation, as the gate will kill all natural ambience, but don't worry about that yet. If the kick drum level isn't even then patching a compressor in after the gate can help to sort this out. However, this setup can also help if the sound lacks definition. If you set an attack time which is not too short (5 to 10ms), it will allow the initial click of the drum hit to pass through the compressor before any gain reduction is applied, increasing the sound's ability to punch through the mix. To best achieve this effect, use a fairly stiff ratio of around 4:1 and adjust the threshold so that around 10dB of gain reduction is being applied to the loudest beats, then set the release time so that the compressor's gain returns to normal before each beat.

If the kick sounds 'stodgy', as often seems to be the case in live recordings, this can be remedied by patching in an equaliser after the compressor and then boosting a little between 5 and 8kHz, in order to give the sound more of an edge. Don't worry about this bringing up noise or high-end spill, as the gate is already cleaning this up. If your setup forces you to EQ pre-compressor, or even pre-gate, there's no need to worry — you should still be able to get a good sound, though you may need to alter the dynamics settings a little whenever you adjust the EQ.

If even these tools are unable to produce the sound you're after, then you might also want to experiment with one of the more specialised envelope-based dynamics processes, such as offered by the SPL Transient Designer or TC Electronic Triple*C. These units are able to totally transform the amplitude of drum sound envelopes, allowing you to easily add or subtract serious amounts of attack and sustain.

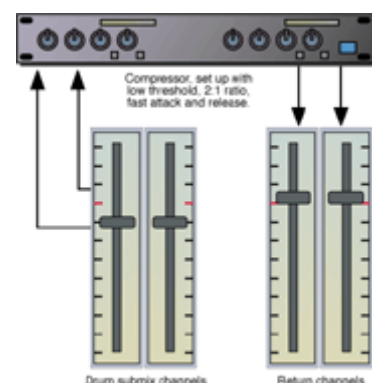
At this point, and before adjusting the sound any further, bring in the overhead mics and see how the kick drum sounds now. The overheads will change the sound to some extent and will also disguise the gating action, so your kick drum should sound much more natural now. At this point you can tweak the EQ again if you feel it needs it, but be aware that the subjective drum sound will be different again when you bring in the rest of the mix, so don't spend too much time on ultra-fine adjustments.

Invisible Compression

Compression has many uses when mixing drums, from managing levels to creating tonal changes and pumping artefacts. And possibly the first thing you'll have been told about using compressors is that they are designed to be used as an insert effect, patched directly into the signal path, rather than in an effects loop configuration. However, musicians being the contrary bunch they are, it was inevitable that someone would think 'well, why not?' And it turns out that there is, in fact, a good reason for using a compressor in a send/return effects loop rather than as an insert, particularly when you want to give drums extra weight and body without destroying the dynamics of a performance.

If you compress in the traditional way, it's the upper portion of the dynamic range that is squeezed in order to pull up the volume of the low-level detail. This tends to even out many of the most obvious nuances of the drummer's performance dynamics — namely the differences between beats which are hit fairly hard and ones which are hit bloody hard! While this 'ironing out' may be desirable in cases where the drumming is of questionable quality, it is much less desirable where the performance of a good drummer is being mixed.

Imagine, instead, that your compressor is being fed from the aux sends of the uncompressed drum



submix channels, with its output then being fed back to the mix through an effects return. If the compression threshold is set low (say at -40dB below the peak level of the drums) with a 2:1 ratio and short attack and release times, such that the soloed compressor sounds like it's really working, you can then mix it in to provide more low-end detail. And the beauty of it is that it won't compromise performance dynamics nearly as audibly — hence the technique's nickname: 'invisible' compression.

One drawback with this approach is that it only works like this in the analogue domain — if you send to a compressor digitally, the processing delay incurred causes the compressor's output to phase with the unprocessed sound. Not that this stops you from pulling a fast one within your favourite MIDI + Audio sequencer in order to get around this — just bounce the compressor's output to disk and then use your audio editing facilities to line the compressed tracks up with the originals. If you feel you have to be able to tweak things in real time then a similar phasing-free alternative is available too: simply patch an ambience reverb plug-in (with as low a reverb time as you can get) directly before the compressor. Naturally, the side effect of this workaround will be a slight change in the space that the drums inhabit, though this change can be minimised by only returning the compressed ambience to the mix in mono.

Mike Senior

Snare Separation

Most commonly used snare mics tend to pick up boomy spill from the kick drum and toms, and may also pick up more hi-hat than is desirable. Once again, gating the sound is a good way to clean it up, and a frequency-conscious gate with some low end and some high end rolled off the side-chain input will help prevent false triggering from the kick, toms and hi-hat, if necessary. However, if you can't get rid of the hi-hat spill completely, don't worry too much, because the overheads should hide it quite effectively as long as you're careful to make sure that any spill breaks through in a consistent manner — the last thing you want is hi-hat spill on some beats, but not on others.

If you can't prevent the gate from triggering on some of the other drum sounds, bring in the overhead mics to see if this will hide the spill sufficiently. If not, then reducing the gate's Range setting will allow a little spill through between beats and may therefore help to produce a more natural result, even though this will be at the expense of separation. Even if your gate is operating cleanly on all the snare beats, it is still worth having a quick listen to it together with the overheads. Gating can really dry out the snare, and you may find that you'll want to add some reverb to get it to sit convincingly with the rest of the kit.

If the snare needs any extra crispness, then try a little high EQ at between 4 and 8kHz, or alternatively try one of the brands of psychoacoustic enhancer on the market — there are quite a number available, from manufacturers such as BBE, Aphex, SPL and Joemeek. Alternatively, you can add more body to the sound by applying a cautious amount of EQ boost at 100 to 150Hz. A little compression can also be handy to even out any level inconsistencies.



Isolating The Toms

Because toms tend to be played only during drum fills, you'll probably find that the tom mics just pick up spill most of the time. Again, out comes the gate, though if the tom mix is stereo, make sure you use a two-channel gate set to stereo link mode. Rolling off some low end from the gate's side-chain input will reduce the risk of false triggering from kick-drum spill. Adjust the gate release time to match that of the toms. As with the snare, if some false triggering still persists after you've done the best you can with the threshold control and side-chain filters, you can adjust the range control to allow a little more spill through, which

will often help to disguise it.

A neater approach to solving triggering problems is to use mix automation, if you have it, to mute or turn down the tom tracks between drum fills. On a hard disk recorder, you can even erase the sections between fills, though it's wise to create a backup just in case you change your mind about it. Naturally, both of these tactics can also be used on the snare track if you have isolated triggering problems or a whole lot of spare studio time...

As with the other drums, compression may be used to even out the levels and to fatten up the sound, while EQ can be used to add weight and attack. The best frequency at which to equalise will depend on how large the toms are and how they're tuned — experiment with frequencies between 80Hz and 250Hz to try to pick out the resonance of each tom being used and as little boost as you can get away with while getting the job done. In a situation where the toms have been submixed to a stereo pair at the recording stage, it's probably best to concentrate on getting the lower toms sounding beefy — leave the high toms to look after themselves. As with the snare, a high-end boost between 4 and 8kHz can add definition to the attack of a sound, and a small amount of reverb can help to put back some 'liveness' that gating has taken out — just be sure to listen to the tom tracks together with the overheads in order to check that any processing is going to have the desired effect.

Hi-hat And Overheads

If a separate hi-hat mic has been used, the chances are that the hi-hat will be much louder than any spill on that track, so you shouldn't need to use a gate unless you have a very tough recording to deal with — in any event, many songs have hi-hat all the way through, so gating wouldn't bring about any real benefit. However, you can usually afford to filter off quite a lot of the low end, as this will reduce low-frequency spillage at least, and can also make the cymbals sound crisper by removing unwanted 'gongy' overtones — to set up the high-pass filter, move the cut-off point up the spectrum as far as you can without affecting the hi-hat sound unduly. If the hi-hat isn't crisp enough, you could give it a little 'air' EQ using either a high shelving equaliser or a bell equaliser set to a low Q (wide bandwidth) and centre it at around 15 to 16kHz.

The stereo overheads are a hugely important part of getting a good drum sound. These mics pick out the cymbals, they add to the definition of the individual drums and they help knit the whole kit sound together. For a rock drum sound, you'd probably start by getting a good close-mic balance, and then you'd bring in just enough of the overheads to get the cymbals sounding good. Alternatively, for jazz or indie material, using more overhead and less of the close mics is the norm.

One potential problem is that once you've turned up the overhead mics enough to get a good cymbal balance, the low end of the drums can lose focus. This can be a problem in any situation where multiple mics record the same source, and the first thing to try in such cases is always the phase-reverse switch. If phase reversing both overhead mics solves your problem, that's great, but if the low end still seems to sound worse when the overheads are brought in, simply roll off some of their low end to minimise the conflict.


If the drums were recorded in a good-sounding live room (or at a live gig), then the overheads

Down The Pan

If you're planning to mix your drums to stereo, then you'll need to decide whether to use your overhead mics as a stereo pair. Given that one hears very little in the way of stereo spread unless standing extremely close to a drummer in action, is it really important to have stereo drums on your record? And, if so, which way are you going to have the listener 'seeing' the kit: from the audience or from the drummer's point of view? Whichever approach you adopt, just be sure to make it consistent — listen to the overheads carefully, and then pan any individual drum tracks to match

shouldn't really need much, if any, artificial reverb, but if they were recorded in a small, dry studio, you'll need to simulate the environment of your choice. Plate settings are commonly used on drums, but short ambience settings will serve better if you're after a tighter sound.

For that vintage drum sound, you could also compress the overheads to get the crash and ride cymbals pumping slightly, but use this treatment with care and make sure it works with the rest of the track. Indeed, you'll need to listen to the whole drum submix in the context of the rest of the mix, particularly the bass instrument and any rhythm parts, to see if it's really working. At this point, you might opt to change the balance between the close and overhead mics or make some final EQ tweaks.

Unless the original drum recording was a total disaster, you should now be somewhere close to a good drum sound. But, before you forget about the drums, there's probably one final adjustment you'll need to make. Once the whole track is playing, the reverb you added earlier may be unsuitable, either because there's too much or too little, or because it's of the wrong type for the song you're mixing. Listen carefully to make sure the kit has a homogenous sound — it needs to convince you that the drums were all played together and not recorded as separate layers, unless you decide you deliberately want to create that disjointed effect. After which you can sit back and enjoy the rest of the mix, because the hardest part of the job will hopefully now be behind you! 

Glossary

http://www.sospubs.co.uk/sos/regular_hm/glossary.htm

SOUND ON SOUND

Europe's No1 Hi-Tech Music Recording Magazine Sound On Sound

Go To **SOS**
Website **SOS**
Homepage **SOS**

Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, UK.

Telephone: +44 (0)1954 789888 Fax: +44 (0)1954 789895

Email: info@sospubs.co.uk Website: www.sospubs.co.uk

© 2001 Sound On Sound Limited. The contents of this article are subject to worldwide copyright protection and reproduction in whole or part, whether mechanical or electronic, is expressly forbidden without the prior written consent of the Publishers. Great care has been taken to ensure accuracy in the preparation of this article but neither Sound On Sound Limited nor the Editor can be held responsible for its contents. The views expressed are those of the contributors and not necessarily those of the Publishers or Editor.
