Space exploration

Musical mush or vibrant and three-dimensional? If your mixes fall into the former category, we've got some remedies for you to check out...

Regardless of how well recorded your individual tracks are, you can easily end up with a messy mix, with all your sounds fighting one another for space. Getting to grips with techniques to create balance, texture, definition, width and depth is the key to avoiding this problem. Here we're going to share some of our favourite tips and tricks to help you separate your sounds and add power and clarity to your music.

To start with, imagine all the elements of your mix inside a 3D box like the one shown in the illustration above. Panning controls the sound placement from left to right, across the width of the box. The up and down placement is determined by the frequencies contained in each sound, with lows at the bottom. The front to back placement is controlled by the sound's volume and the amount of reverb or delay applied – the wetter and/or quieter the sound, the further back in the mix it appears. Keep this picture in mind, and always think of placing instruments within this space when mixing.

Distance

Reverb can help you define your mix and turn it into a rich, deep 3D experience... or, if you go over the top, a booming mess! Careful application of the correct type of reverb will give depth to a sound and enhance the stereo image. Plate reverbs have a shimmering sound good for vocals and drums, while hall reverbs add depth to strings and large special spot effects, such as explosions. Room reverbs suit many instruments, including guitars and drums. It's a good idea to keep at least one dry instrument in the mix to define the front focal point of your 3D box.

Guitar reverb

Miked-up guitar rigs naturally have a mono reverb sound (unless, of course, you're using a dual cone speaker cabinet and you have your head pressed hard into the centre of it!). Try using a vintage-sounding spring reverb on a guitar part with the reverb panned to the same place as the guitar. This will give it its own space without encroaching on other elements in the mix.

Done that? Now try the opposite, panning a mono reverb effect to the opposite side of the original instrument.

Combination effects

You can use reverb on delayed parts as well. Send an instrument separately to a wet reverb and a delay. Then send the delayed signal to the same reverb to create an even dreamier effect.

Bare bones

The foundation – or internal structure, if you like – of a mix lies in an even low end.

Certain bass notes can tend to boom too loudly or dip in level, as can weakly played kick drums. This should be corrected with compression and level automation, rather than corrective EQ.

For separation, try this: at 80Hz, boost your bass drum and cut the bass. At 110Hz, boost the bass and cut the bass drum. This same principle can be used on other competing instruments.

To further help the bass cut through, it's vital to filter out unwanted bass from other instruments. Use high-pass filters and roll off all the sub frequencies. You may think you can't hear any, but it's amazing how these can all add up over multiple tracks. This bass build-up can also affect the levels due to phase cancellation, and can cause notes to disappear. This one simple tip can help bass go from being muddy and unclear to tight and defined.

Drum distance

Overhead mics on live drums create ambience and space. Ride the levels to create a tighter feel (in the verse, for example). Apply some reverb (either a room, non-linear or gated effect) to help the overall drum sound without pushing it too far back in the mix.

Creating stereo

As well as reverbs, delays can be used to create space in your mix. Try panning a mono instrument – such as a guitar – to one side, then sending it to a short delay (below 25ms) panned to the opposite side. This will instantly create a stereo image of the instrument, making the mix sound much wider, and creating space in the centre for other parts to sit in, such as the vocals. Be sure to check these kinds of effects in mono, as very short delays (below 10ms) can produce phasing problems, where you get strange sounds or drops in level as one identical sound cancels out the other.

Don't hard pan this effect – 3 o'clock and 9 o'clock are about right. If you're unsure of the effect or worried about the phasing sound when listening in mono, fine-tune the delay time plus and minus 4-5ms to hear the difference it makes. Naturally, people's ears will tune into the direct signal, as the brain hears this first, so to create a level stereo image, you may have to turn the delayed signal up louder.

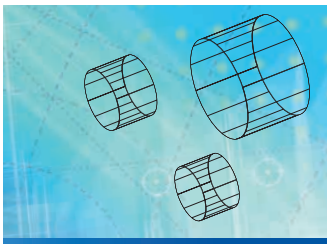
STEP BY STEP Creating stereo

1 Here we've created a buss (Buss 1) next to our existing guitar track and sent the signal to it, panning our guitar to the left in the 9 o'clock position. The buss return is where we shall have our delay, creating a stereo effect from just one guitar. »

2 Now we've panned Buss 1 to 3 o'clock (opposite to the guitar track) and inserted a delay. Here we've used Logic's Tape Delay. Its default value is the track tempo and we can choose a note value. This is no good to us, though, as we want a delay as low as 15-25ms. »

3 To adjust the tape delay, take off the **Sync**, drag the tempo up to full and select the smallest note value. Now we can adjust the delay with the sliding groove control. Lower the **Feedback** to almost off and slide the **Low-cut** up slightly (adjust to taste). Press play and adjust the volume until it suits you. Check the sound in mono and adjust the delay time to suit.

Space, texture and balance

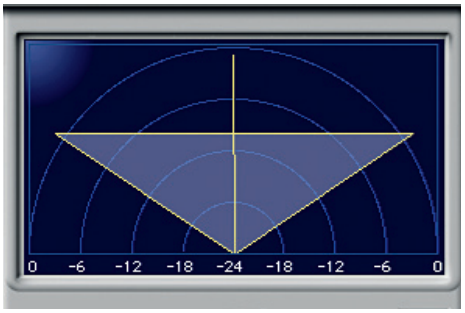


Phase shifting

Delays of less than 20ms or so can be used to achieve a phase shifting effect, creating a subtle sense of up-and-down movement. Combine a small delay with the original sound at near-equal volume with lots of feedback. Experiment with making the delay time shorter to get more shifting.

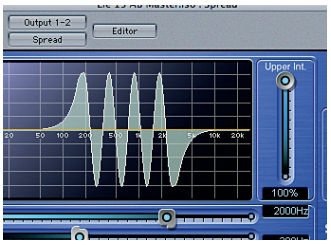
More width

Spatial enhancers are special tools that can make a sound appear to be coming from above or behind the listener. One of the best plug-ins around to help achieve this effect is Waves' S1 (see image on right). This complex processor can help fix all kinds of centre image positioning problems, and add subtle stereo width without the unwanted side effect of bass phase cancellation. Logic comes with its own version, called Stereo Spread (see right, bottom image). These types of processors should be placed on your master output or used after you've finished your mix. You can use them to add width to keyboards and backing vocals, too.



Checking

Although you shouldn't mix on headphones – it will give you a false sense of stereo width, among other drawbacks – you can use them to check that your stereo image is balanced, with both sides at equal volume. They also come in handy for making sure individual instruments haven't been panned too far out of the mix. Just don't forget to check your mix in mono as well.



STEP BY STEP Phase shifting

1 Back to our guitar track. After processing with EQ and compression, we'll place a delay as an insert (not, as in our earlier example, on a return). The latter is an added effect, whereas this is a process – we want to change the original sound, not add to it. »

2 This mono delay has a tempo-based default that's no good for our purposes, as we want to use a very low time (below 20ms). However, we can fix that. First, adjust the delay as we did in the *Creating stereo* walkthrough (see p53, step 3). »

3 Set a delay value of 20ms and 50/50 wet/dry balance, then experiment with the controls. As you lower the delay, the signal will shift in position up or down. For a more phase-shifted effect, raise the feedback quite high. You could even add some LFO depth for a swooshing movement.

STEP BY STEP Creating movement

1 Pre-delay – the time it takes for a reverb to kick in – can be set on most plug-ins. This creates movement from front to back as the dry signal is heard, followed by the reverb effect later. This creates a natural sound with depth and dimension. Hearing the vocal first helps the clarity and stops the sound becoming muddy. »

2 If you're using a reverb without a pre-delay (such as the excellent free Black Water Reverb), just add a delay before it. Here we've used Logic's Tape Delay set to 35ms with no feedback or filters, although you can use filters to adjust the frequency response of the reverb – try rolling off the highs to change the reverb decay.

Panning

Even the slightest pan movements can affect the volume and 3D image of your mix. Experiment by putting down two or three mixes, with some panned harder than others. You'll notice drops in levels as the pans get more extreme.

Other effects

Chorus applied to bass and guitars will help spread the instruments out, and it can also be used very sparingly to good effect on vocals.

For a nice vocal stereo spread, send the vocal to a stereo pitchshifter. Set one side 4-8 cents up and the other 4-8 cents down, with the delay between 10-25ms (Waves' Doubler plug-in will achieve the same effect). For extra spread, send the effected signal and the source vocal to the same reverb.

Getting the balance right

Maximum gain
Beware of 'creeping fader syndrome', where you gradually turn everything up until all the faders are at the top. As a good mixing rule of thumb, don't allow any fader to go above 0dB.

Loud mids
If the midrange is too loud, it can make your mix sound harsh and nasally. Too low and your mix will have a hollow sound. Distribute your frequencies evenly and make sure the vocal has plenty of room and that it isn't clashing with any guitars or pianos.

Too many highs
High frequencies should be distributed evenly as well. Boosting a certain frequency too much can lead to a harsh mix. Watch out for listening fatigue: if you spend too long mixing without a break, your mix will get brighter and brighter as your ears get more and more tired.

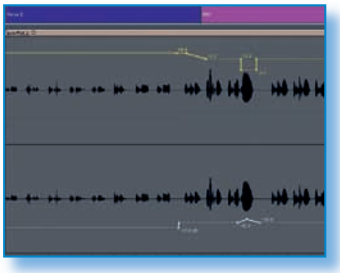
Jumping levels
Listeners don't like levels that jump out and hit them – that's one of the reasons commercial music is so compressed. On the other hand, if you level your mix too much, you'll lose the dynamics.

▲ This mix has a bad case of creeping fader syndrome

TEXTURE TIPS

Highlighting the vocal

This is a vocal track with simple volume automation to reduce the loud parts. We've also automated its reverb to help lengthen the sustained notes, creating more body, width and depth, and to help the vocal to stand out. This is a good trick to use in sections like choruses, where the singer is really belting it out. Using subtle effect tweaks like this throughout a song can really help to give your vocals that pro edge.



Intimacy

Depth – or lack of it – can create an intimate texture. Bring a soft vocal forward by stripping away any reverb, while simultaneously using reverb on the instruments. This will help create the illusion of closeness with the voice. However, this will be difficult to achieve if the vocalist was far back from the mic when recording.

Radio star

Here's the main vocal track from a recent commercial release, with a double track coming in at the bridge section. This has been treated with a simple 'radio' EQ, which involves rolling back the high and low frequencies while leaving the mids to cut through. Adding a compressor with a high ratio and fast attack will help control the radio effect. In this case, it was blended with the main vocal.

Hooks, contrast and dynamics

A focal point such as a vocal, lead guitar or synth hook will take the listener through the song, passing them from one passage to another. Avoid leaving holes where nothing happens – bring up these featured parts in between lines, while keeping the musical background texture changing in different sections of the song. Alter the volume for interest, using drop sections to make chorus intros sound louder or middle eights more alluring before a big outro. Simple things like this can save a lacklustre mix.

Clean break

If you're adjusting levels or muting instruments at a certain points in a song – say, half a bar before the chorus comes in – make sure your timing is precise and your instruments are cut at the exact spot. Also remember to mute any delays that might spill over and spoil your clean break. The same can be said for cleaning up audio parts in general: background noise or in-between silence should be removed unless you need some 'comfort noise' (see p27). With audio waveforms, it's often better to edit these on screen than to use a noise gate, which may close too quickly if incorrectly set. Little tweaks like these can leave you with an even texture, smooth flow and sharp sound, rather than a cluttered mess with noise from one instrument disturbing another. It's often these small details that determine whether you end up with a sloppy, amateur mix or a slick, professional sound.

Changing sounds

Producers have long used the trick of piling on effects at the chorus to lift a vocal. The same treatment can work for instruments. Take, for example, a rhythm guitar playing through a verse, ending in a big single chord. Treat the guitar with a short reverb, then emphasise the end chord by using a big phaser and lowering the reverb send. This gives the listener a lovely texture change as well as heralding the end of the section. The same treatment could be used on a drum fill. Spot effects like these can really add something special to a track – remember to be subtle and complementary, though!

The old radio drop

Using drastic filter changes on a vocal to create an old radio sound can lift a line or help distinguish a bridge sound from the verse. Think of texture changes like walking from one room (song section) to another that has different carpets. The alternative effect is to filter the whole mix apart from the vocal. Sub-group all the instruments, automate a low-pass filter to roll off the high frequencies, then slowly bring the mix back in. cm