

Mixing Immersive Audio — *A Contemplation of Perspective*

Exploring the creative possibilities and technical realities of mixing music in Dolby Atmos and immersive formats — from speaker arrays to listener perspective.

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This past year I've been doing a lot of mixes in Immersive Audio, what in the past we have called surround sound.

There are many debates going on in the music community regarding the future of Immersive Audio. Will the audio world get burned again as happened with previous formats; 5.1, DTS, etc, investing in hardware and room design for a product that never took off? Will enough households have systems capable of playing back these formats to make it worthwhile?

I've found that new software and hardware pieces to put together an Immersive mixing suite have become very powerful and relatively affordable.

Immersive music can be played from Blu-Ray discs, but is also streamed by services such as Tidal, Amazon Music, and Netflix. Many home theater receivers will already support formats such as Dolby Atmos and

Sony 360Reality Audio, as do many gaming systems such as the latest Playstation and Xbox with full support built in.

So I think that the customer base is already widely equipped for receiving and decoding the streams. The last link in the chain is the home speaker setup. A number of soundbars and smart speaker systems are available as an alternative to an expensive multi-speaker setup, using up-firing speakers to bounce sound off of the ceiling, and other speakers and psycho-acoustic effects, beam forming, and other technical means to simulate the full range of speakers. Of course if you have a 7.1.4 or better speaker system to listen to, the full effect of the format can be fully realized.

Put all together, I think we might finally have a surround format that will stick around. The record labels are supporting it with budgets and eagerness to release new and old music in Immersive formats.

So now that there is an Immersive Music "here" here, let's dive into perspective.

The listener's perspective gets pushed all around in immersive mixing, it is no longer like a stereo mix where the listener's perspective is generally equivalent to watching a stage performance in front of them.

In Immersive I have many perspectives to play with. I can put the listener in the band, on the stage with the performers, in the front row, etc. I'll mix these different perspectives up with different elements in the mix; it makes no sense in a space-time sense, but it can present a powerful musical experience.

Immersive goes a bit beyond surround with more speakers around the listener and speakers above and sometimes below the listener's audio plane.

I'm mixing in Dolby Atmos in a 7.1.4 speaker format. This means 7 speakers around at ear level (Left, Center, Right in front, Left and Right sides, and Left and Right Rear Surround, plus 1 subwoofer, and 4 height speakers, Left Top Front, Right Top Front, Left Top Rear, Right Top Rear).

As you can see it quickly becomes very technical and complex. I encourage you to read more about the technical sides elsewhere, what I want to think about here is what I'm using all of those speakers for.

I am also doing what is called Binaural Headphone Rendering of these mixes where the Atmos mix is rendered down for headphones. Unfortunately this is where most listening is currently done for Immersive audio, but the binaural listener is not able to hear a lot of what I'm talking about here.

Regular stereo mixes have every instrument, vocal, and sound crammed into two speakers and then we work on creating "space" with reverbs, delays, panning, etc.

My work is taking those completed stereo mixes and finding ways to bring the listener into the mix, or to make the music envelope the listener. I have not yet worked on any projects crafted specifically for immersive music, those could have very different perspectives because they would be recorded and crafted with more than two speakers in mind.

Traditionally surround mixes (5.1) have thrown some of the effects into the rear speakers to make space. I'm still doing some of that, but I want to take it further. The hard part is not making it weird and keeping it musical. Let me see if I can elaborate.

Take the drums; I could make it so that you feel like you are playing the drum kit. Cymbals to your right and left, even up above the kit a bit, toms panned left to right, drummer's perspective writ large. But because we're not used to listening that way, and because the drums were not recorded in that way, it sounds a bit weird.

Also as drums, and any signal, are pulled out of the stereo image and into more speakers, the timbre of the sound changes due to interactions between speakers and calculations and compensations within the software. It doesn't maintain the same sound of the mix the way the artist wants to present it.

So I tend to keep the drums pretty much as they are in the stereo mix. If I can find a bit of drum loop that works to the side or behind it often does sound nice; but it is usually a subtle part of the beat.

Similarly a bass guitar or mono synth bass sticks pretty much to its traditional space. It begins to sound odd to have the bass anywhere but to the front center. A stereo synth bass I might play a bit into the side speakers because it sometimes sounds cool to have a big fat pad where you can't tell exactly where it is coming from.

Next percussion; I might move some stuff out towards the listener, but generally not bright regular sounds because they become distracting. So I might put a muted sounding clap to the listener's left and right, but not a bright clap.

Guitars are often locked into the rhythm tracks, but I'll begin to move them out to get that enveloping presentation.

In a sparse track with an acoustic guitar I might try to put the guitar "into your hands" towards the center of the room; again I have to watch for timbre effects.

I like to try to take a solo; guitar solo, sax solo, etc. and move it toward the listener. Anything that the listener will "air-guitar" to is fun to try in an in-their-hands perspective.

In a rock track, the "wall of sound" needs to remain a wall, but I might curve it a bit towards the left and right sides if I can without losing the groove, or find some parts to put behind the listener and make it a "room of sound".

Keyboards are nice if they have a doubled part, I can throw the double in the rear speakers and really make the part huge; but again, muted sounds generally work better there than bright sounds.

Synthesizers really can shine when spread out; again I'll look for doubled parts to make a huge sound by panning front and rear.

I'll also be moving parts within the mix. A pad that was stationary in the stereo mix might be subtly moving along the sides with the rhythm of the song. This works very nicely for sounds with a natural doppler or wah effect; leslie speakers, wah guitar, etc.

Live strings are wonderful to play with because they have so much depth in real life. I can't really spread them as if I am the conductor, it is a bit too close for perspective, but I like to spread as if I'm in the first couple of rows of an auditorium and also add a lot of their natural reverb to the back and even height speakers to really sound like a concert hall.

A small string or horn ensemble, if close mic'd separately, or using a multi-channel mic, ambisonic, or immersive microphone array, can be spread around the listener so the perspective is sitting within the section, again unnatural but dramatic.

Vocals are the most fun. I like to have doubles and harmonies surrounding the listener so you feel like you are the center of attention.

The lead vocals stay in audience performance perspective, but I might throw some adlibs behind you for fun if it fits; like you are sitting on stage and the singer might walk behind you.

The top speakers will often have a bit of reverb in them to enhance the space, and then I'll try to find some intermittent things to put up there; radio effected vocals will fit nicely there; they already have an out-of-

perspective feel to them. Tinkly synths or bells seem to work well with height. Sweep effects can be panned back to front but also might work top to bottom; a descending sweep on a bass drop is very dramatic. A vocal part above your head has a "voice of God" perspective.

Immersive Audio is still a new and developing field for composing, mixing, and presenting. If you get a chance to hear it played back on a proper system, have a listen and think about what the artist and mixer are doing with perspective. For those who are writing and producing music for Immersive projects, you will have tremendous freedom to present a remarkable and dramatic performance. I look forward to hearing your work.

I hope you have a chance to listen to the perspectives I've put into these mixes.

Track Breakdowns

Benny Blanco ft. Marshmello "You"

A lot of the mix remains in the front, especially in the verses, but in the chorus I break out the horns and "ooh vocals" in surround. This really makes the contrast between small verse and big chorus more dramatic. The piano gets a super wide effect pulling it into the sides.

Ariana Grande "34+35"

Ariana's answer BGV's get spread all around for a chorus of Ari surrounding the listener. The lead vocal sings from the front, and the BGV's answer in surround. I move her talking adlibs around above, behind,

and beside the listener; you are the center of her attention.

Katy Perry "Cry About It Later"

I've spread the slap delay chorus on the lead vocal out toward and behind the listener. Lots of the vocal reverb, delays and chorus are in the sides and rear. It really puts you into Katy's space. Talking parts and adlibs again with the "over your shoulder" and "voice of God" perspectives. You can't avoid Katy in this song, she is coming at you from every angle. The big horn like pads spread all around as is the pulsing electronic piano. The buzzy synth moves a lot and the guitar solo is pulled toward the listener a bit.

Selena Gomez "Adios"

The strongly effected parts of this production work nicely spread around because they have an altered perspective already. The synth vocal sounds move in and out, towards and away from the front. The muted piano in the bridge comes out far into the room. Lots of little sounds behind, above, and beside the listener and lots of movement.

Sam Smith "Diamonds"

I start with the repeating intro vocals around, and the bells overhead; and then it breaks down for Sam's verse with a very wide piano and the vocal reverb swells moving front to back. The swell into the

chorus moves back to front and everything drops to solo vocal; then the chorus hits and envelops with the hums around the listener, moving back to front. I've played with the bridge lead vocal a bit moving it into the room in your face and then back to the front wall.

The Weeknd "In Your Eyes"

A fun one to mix Immersively. The choppy vocoder vocals surround the listener and the adlibs fly around the room. I've swept the drum fills from back to front and the synth tension swells around the room. The Sax solo is in the listener's hands. Some percussion out into the room because the rhythmic vocoder helps to support it.