



Audio for AAA Virtual Reality Experiences

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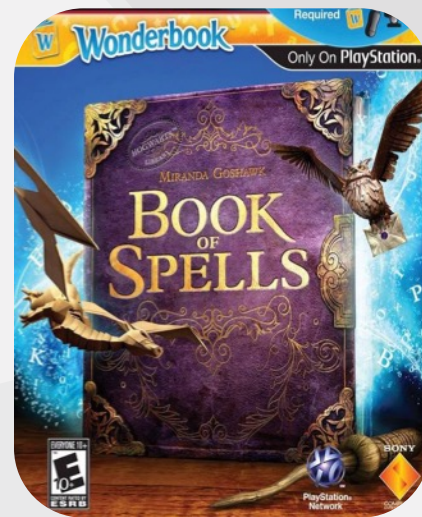
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Audio for AAA VR Experiences





PlayStation®VR



Our Philosophy and Approach



Believable does not
always mean realistic

We're building experiences,
not simulations

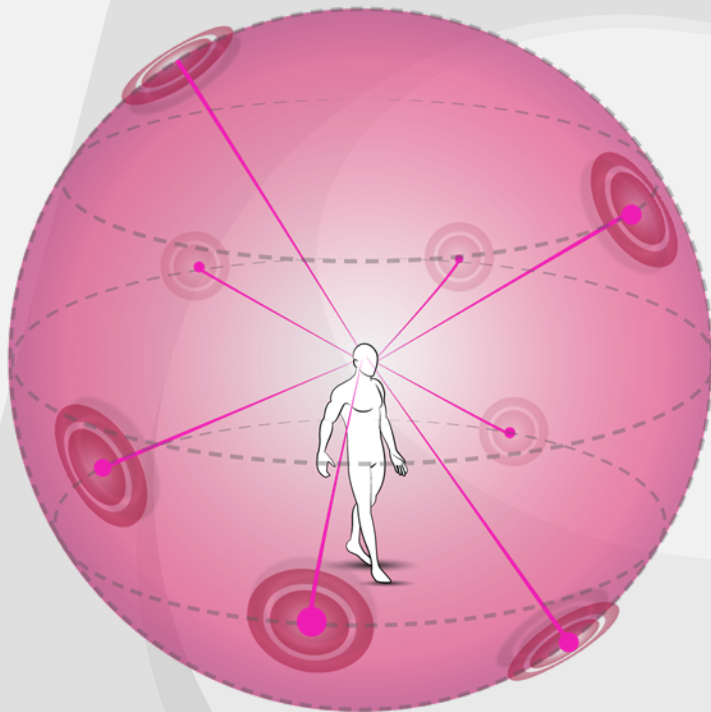
Our Philosophy and Approach



“Hollywood Real”

Maintaining suspension
of disbelief

What is 3D audio?



Source Material

- Dry as possible
- Avoid baked in reverb
- Give the system material to work with
 - Wide range of frequencies, especially mids and highs



Asset Design

- Mono for point sources
- Split multi-channel into mono sources
- Multi-channel content is ok but has considerations
- Short sounds can be difficult to localise
 - Look for opportunities to give the player additional information

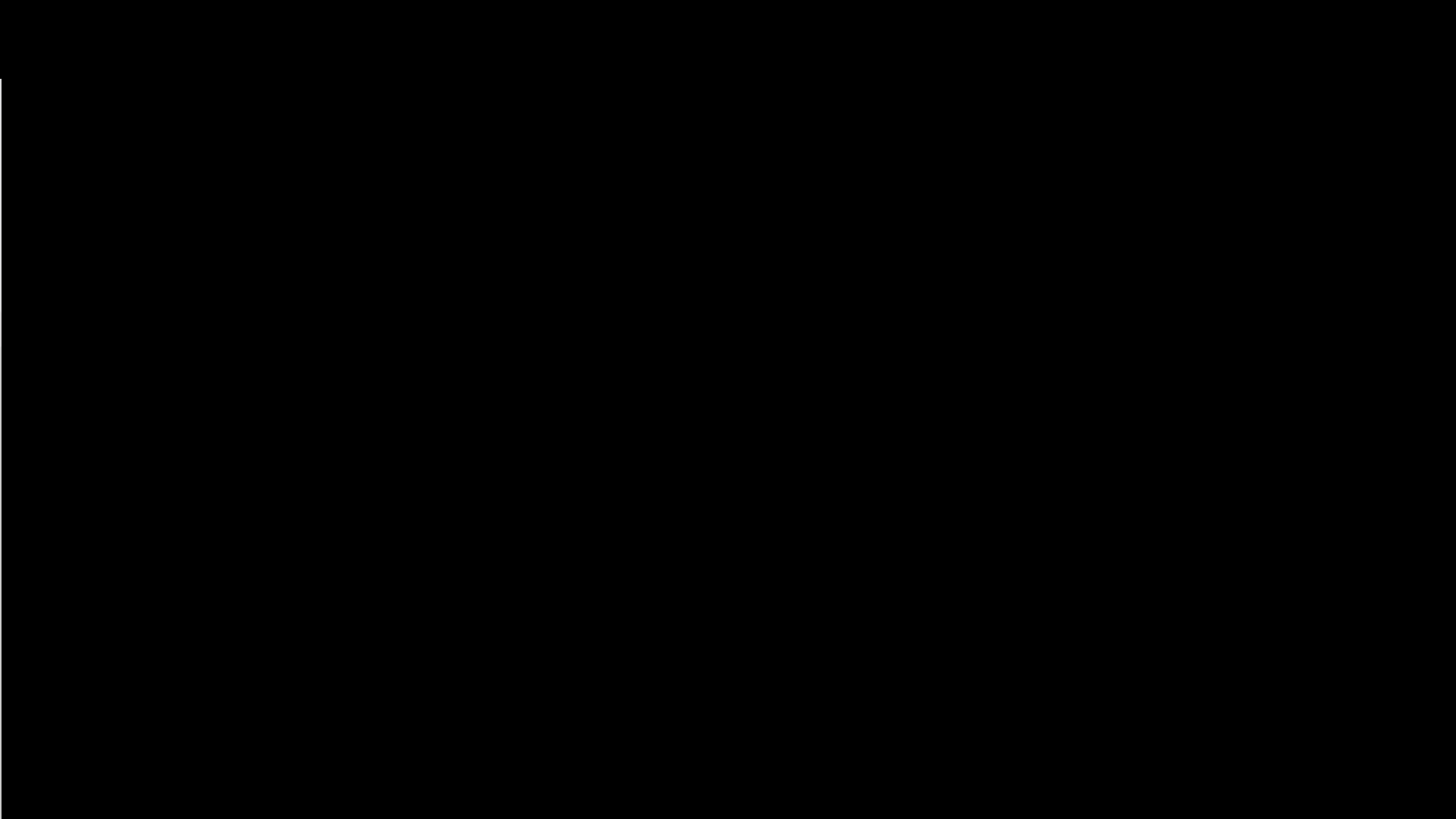


Player Sounds

- Subtle and neutral
- Feel rather than hear
- Sync with something in the world



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Player Sounds

- Using real world sounds
- Microphone Input



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Dialogue

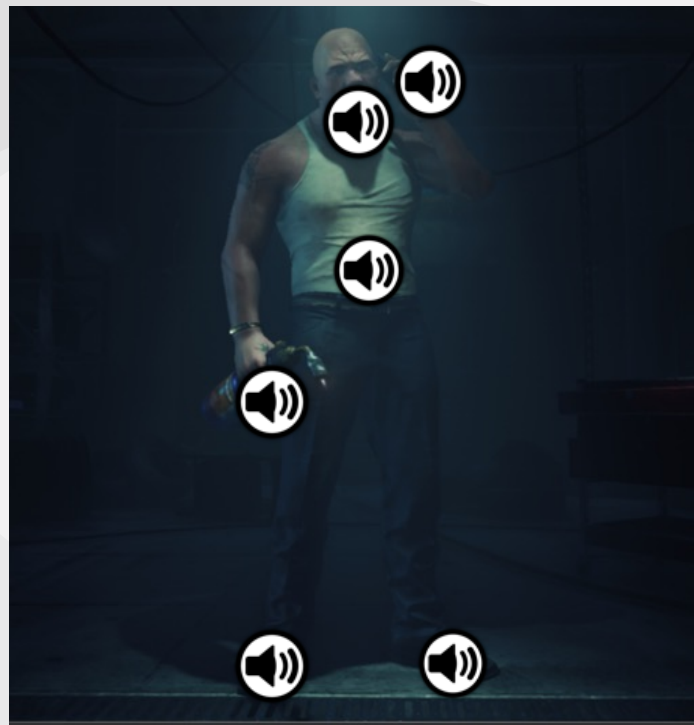
- Voice over style doesn't work well for 3D dialogue
- Too much compression pulls the dialogue out of the world
- Performance is crucial
- Everything needs to be replicated in other languages



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Awareness

- Correct position / more emitters
- Respect head tracking
- Audio Environment – audio specific physics

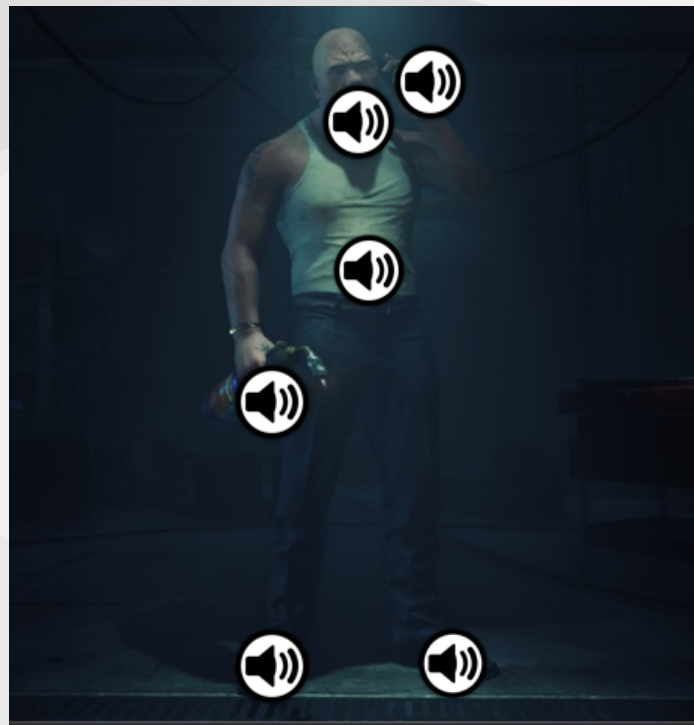


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Reactive

- Believable real-time feedback
- Player can do anything
- Reinforce actions in the world



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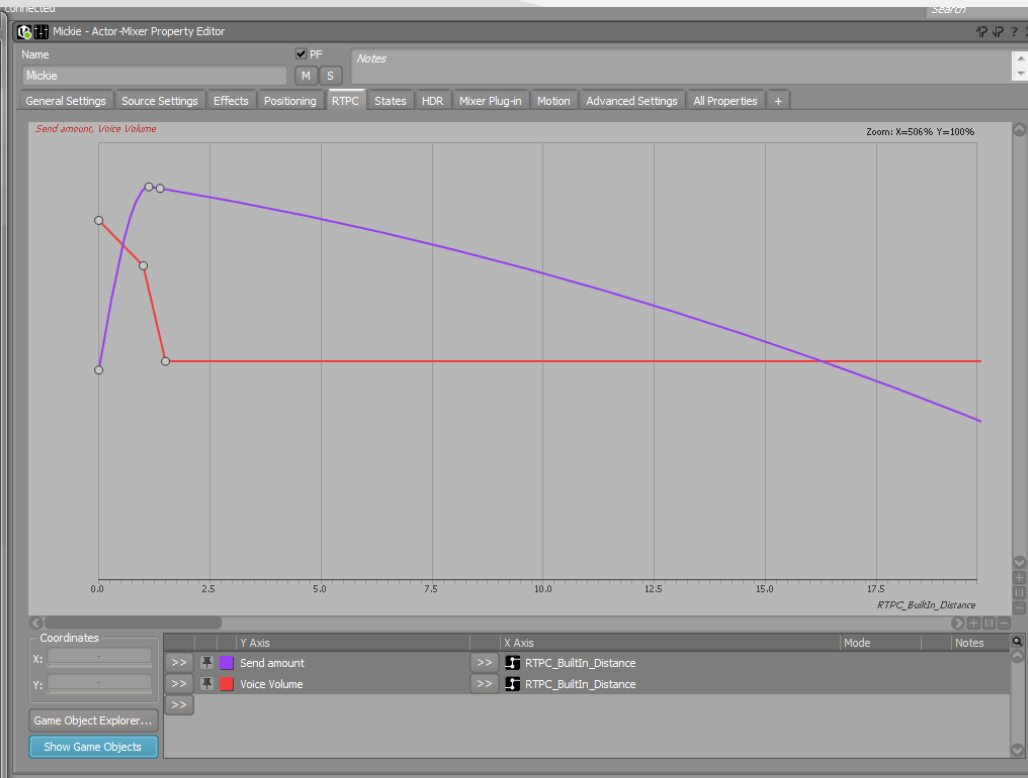
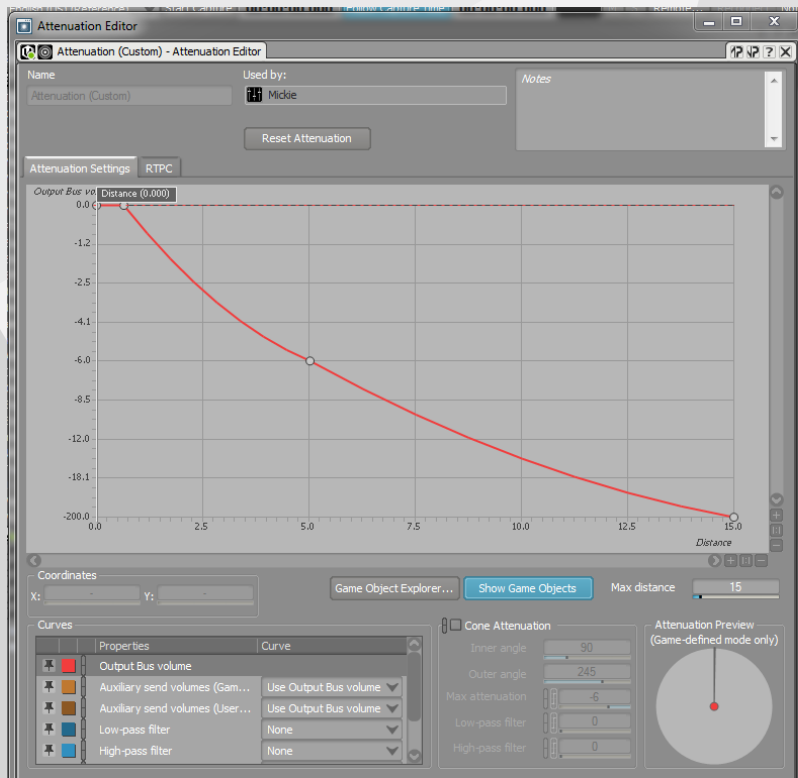
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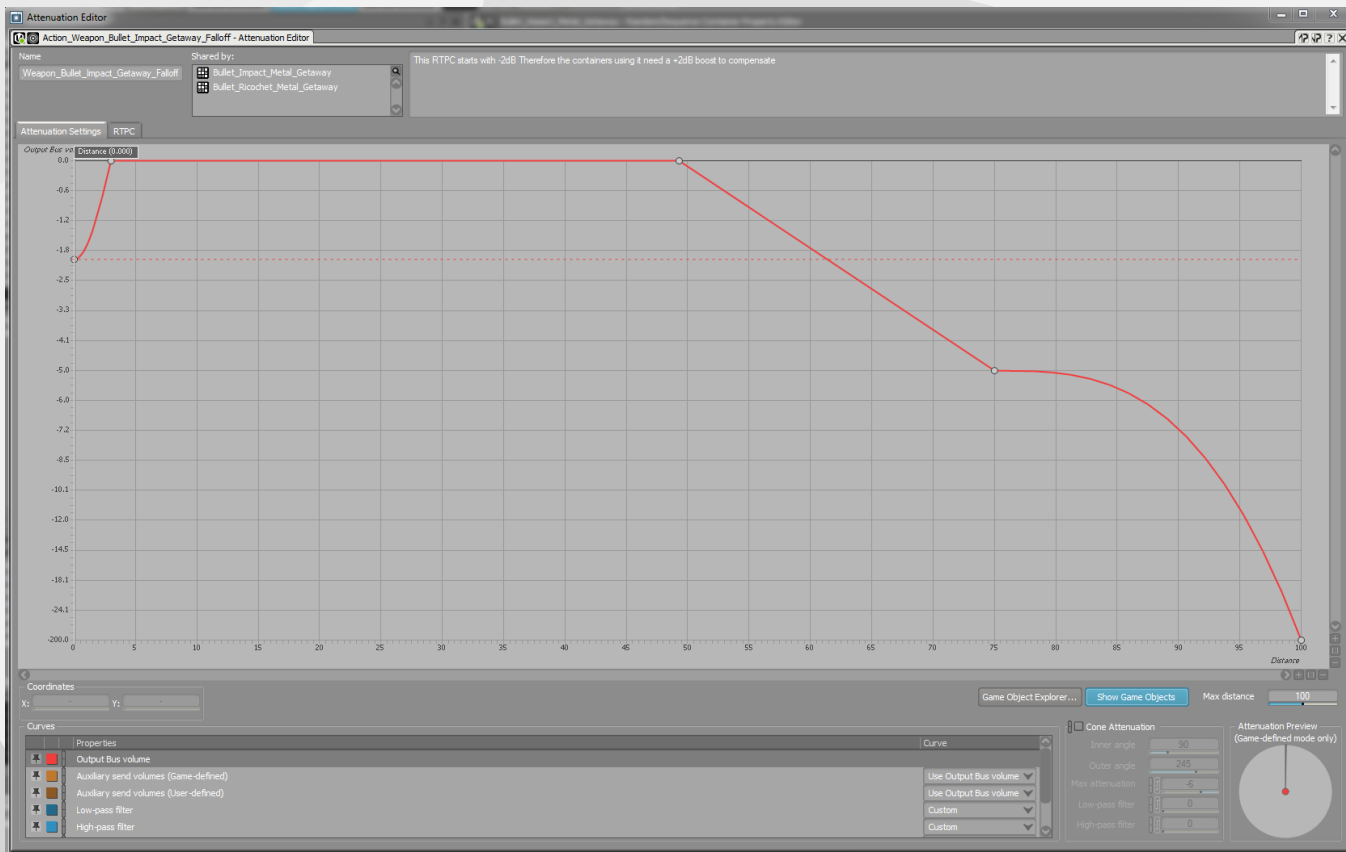
Distance and Proximity

- You don't get this for free
- Driving reverbs with distance
- Exaggerate sounds at very short distances
- Unusual attenuation to serve gameplay



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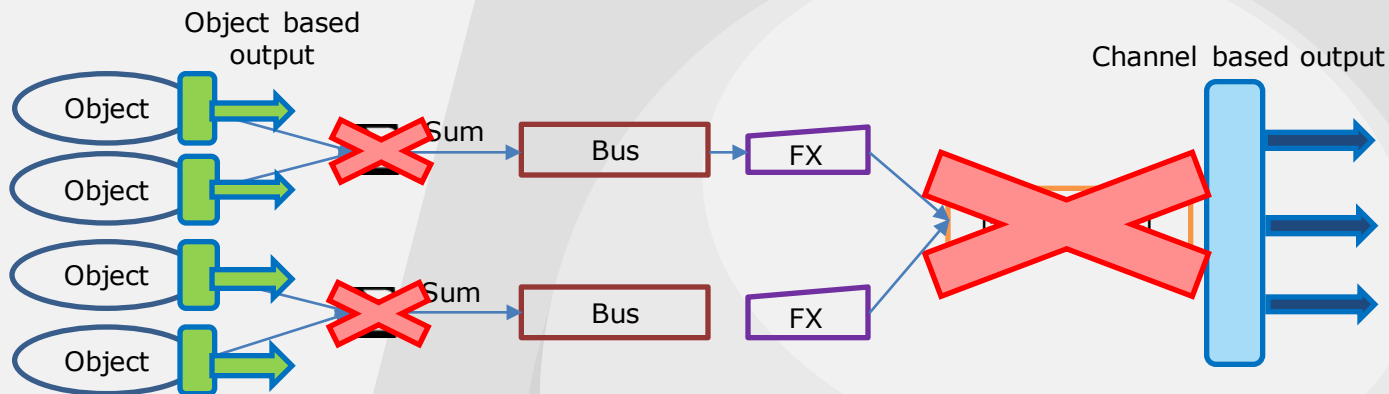


Iterative

- Experimenting is key
- Need quick prototype and iteration tools
- Spend time up front on your tools



Dynamic mixing – Object based systems



Dynamic Mixing

- Moved runtime mixing out of the bus structure into the object hierarchy
- Lots of side-chaining in small amounts

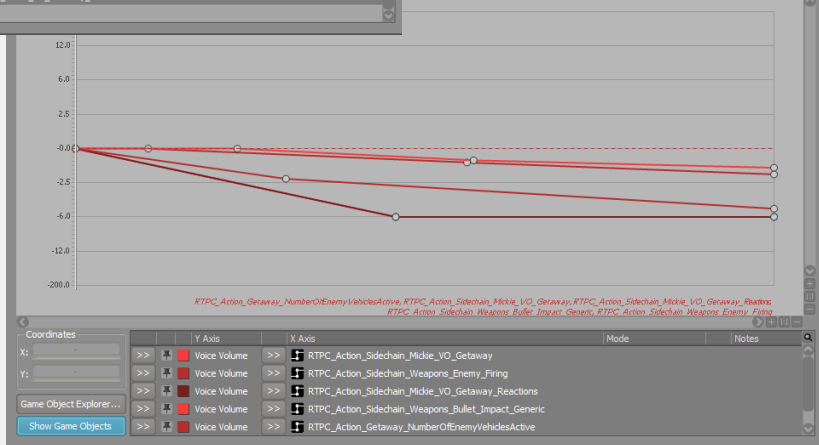
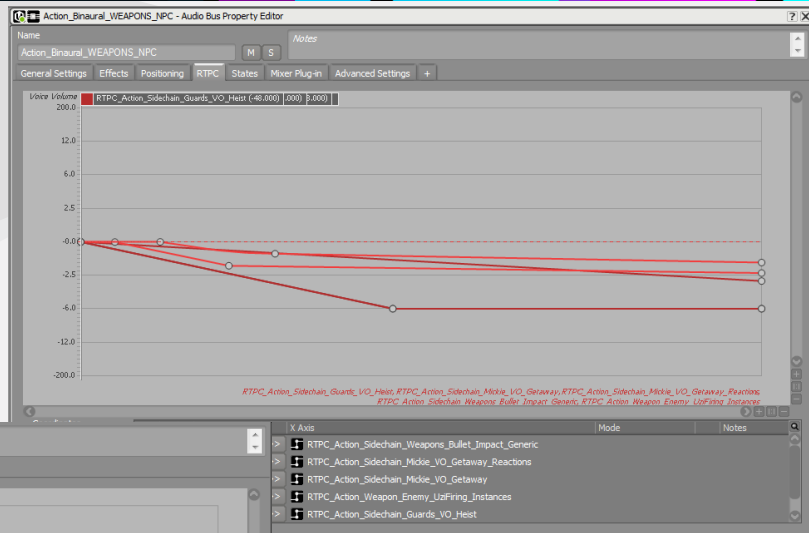
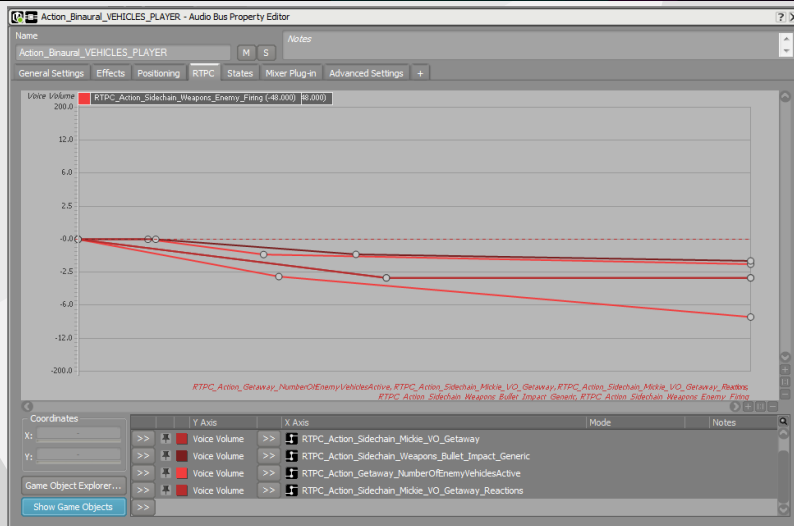


Dynamic Mixing

- Heavy ducking is very distracting in VR



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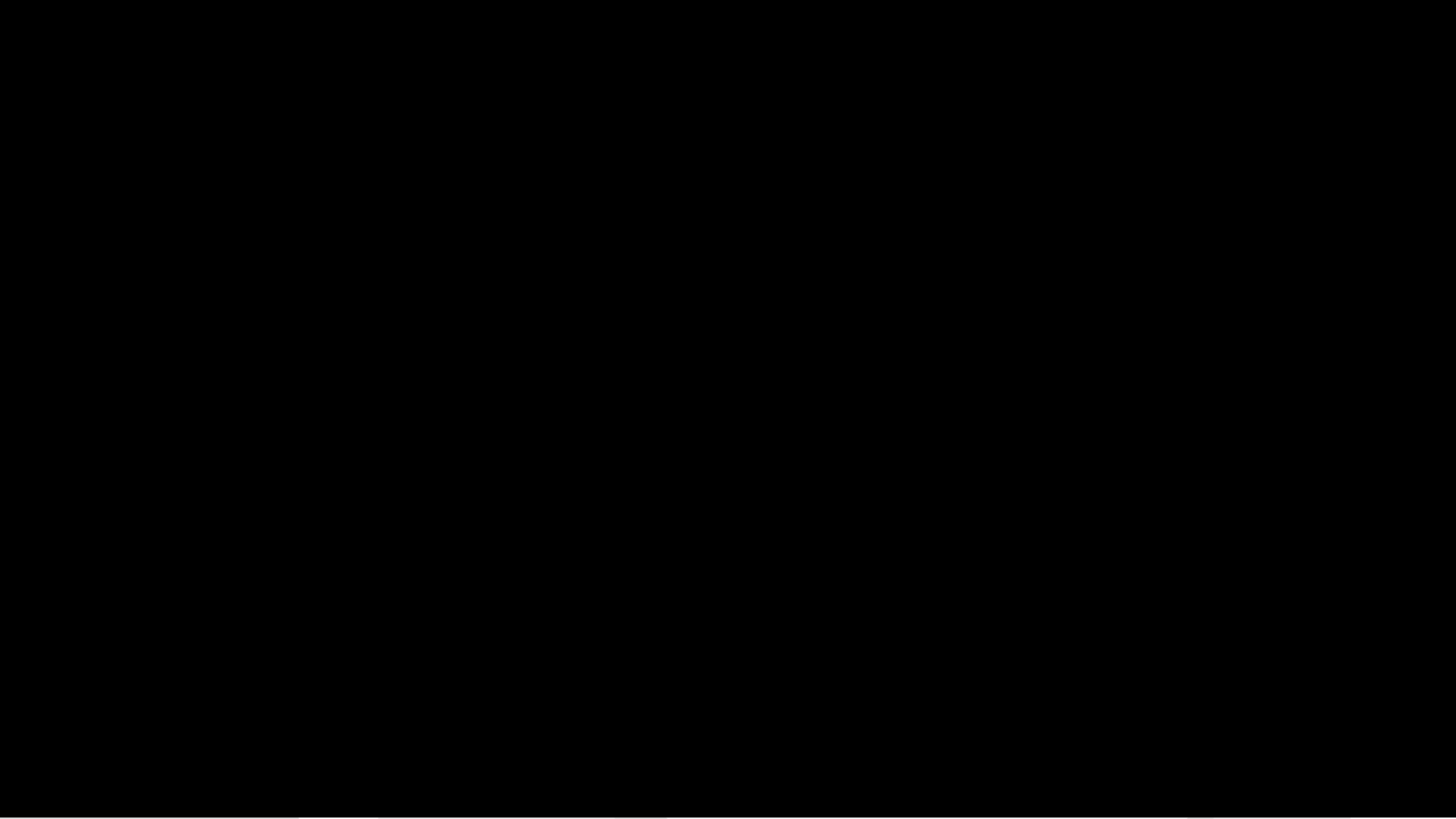


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Focus System

- Influence the focus of a scene
- Clean the soundscape
- Enhance detail
- Emulation of the cocktail party effect





Effects and DSP

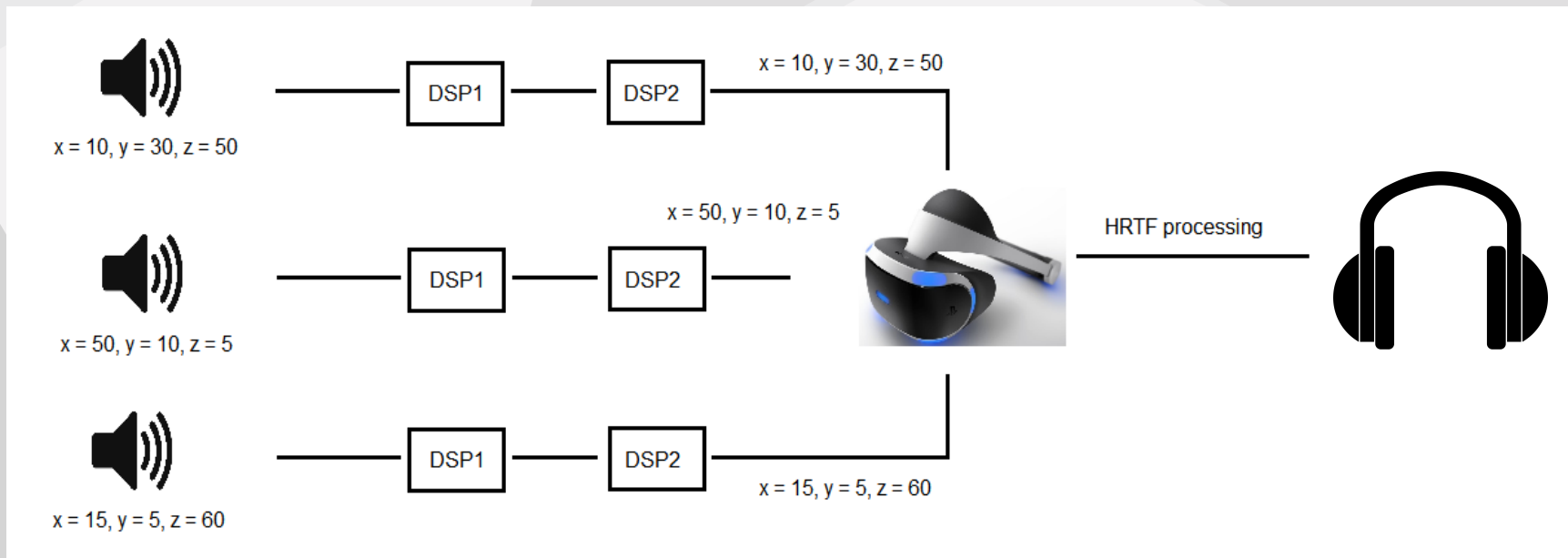
- In object based systems, summing and buss processing don't make sense
- Need to maintain object signals
- HRTF has to be the last step
- DSP done at object level



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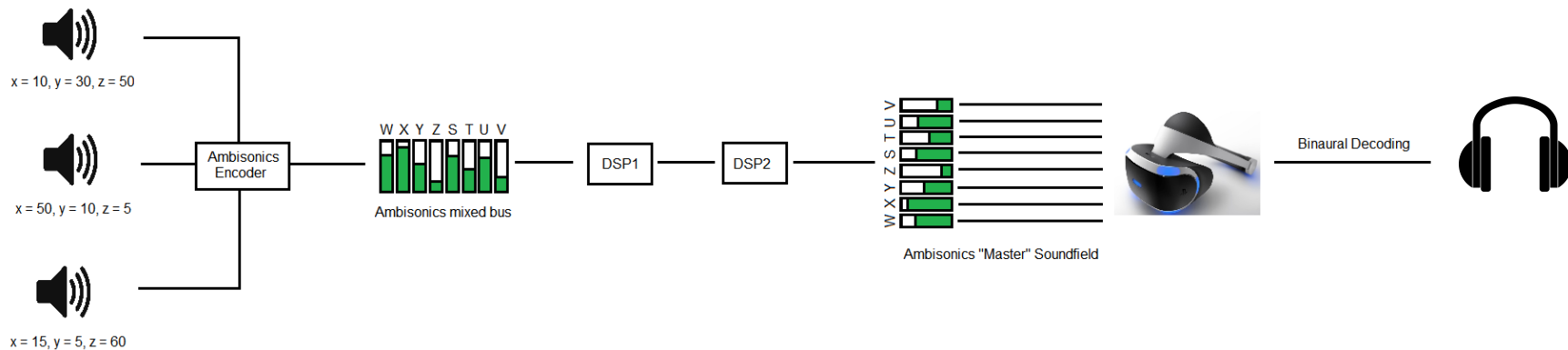
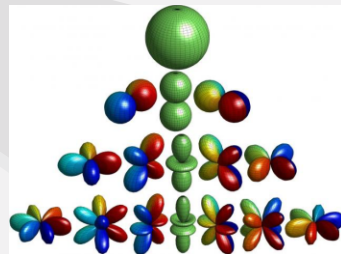
Effects and DSP

Signal routing for 3D objects



Ambisonics - A future middle ground?

- More traditional approach to mixing and processing
- Good level of positional fidelity
- Decode to any speaker format



Output

- Headphones = Great for head-tracked 3D audio
- Some special output options
 - i. Discrete 3D Objects
 - ii. Surround “bed”
 - iii. Straight to ear



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Summary

Understand and respect head tracking

Recognise opportunities to reinforce the player in the world

Value experimentation and iteration

Audio can make or break immersion

Thanks for listening



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