Hedgehog Noises in VR

Audio for Oculus Story Studio's 'Henry'

Tom Bible

Audio Director / Sound Designer / Composer

Introductions

- Star Wars: 1313
- Star Wars The Force Unleashed 1 & 2
- Star Wars: The Old Republic
- Monkey Island: Special Edition 1 & 2
- Forza Horizon 2
- CounterSpy
- Rogue Trooper
- Sniper Elite

What to expect

- What is Henry?
- How we worked with binaural audio
- Audio production process for Henry

What is Henry?

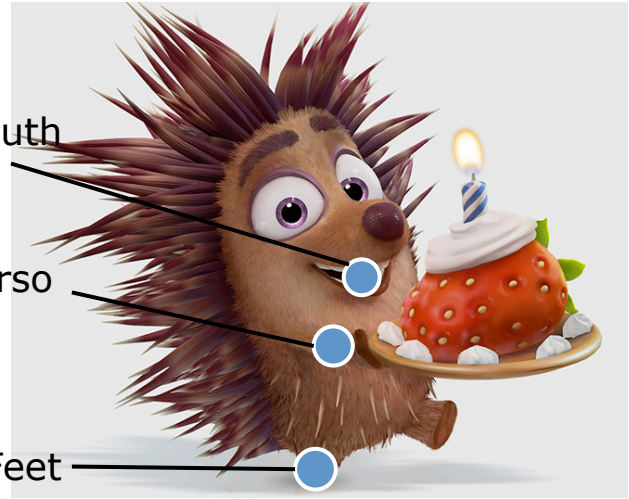
- VR immersive short
- 10 minutes
- Real time Unreal + Wwise
- Fully binaural
- Low level of interactivity

A New Medium

- Not a film, not a game
- New conventions:
  - Restricted movement
  - Limited interactivity
  - Limited perspective changes
  - No 4th wall

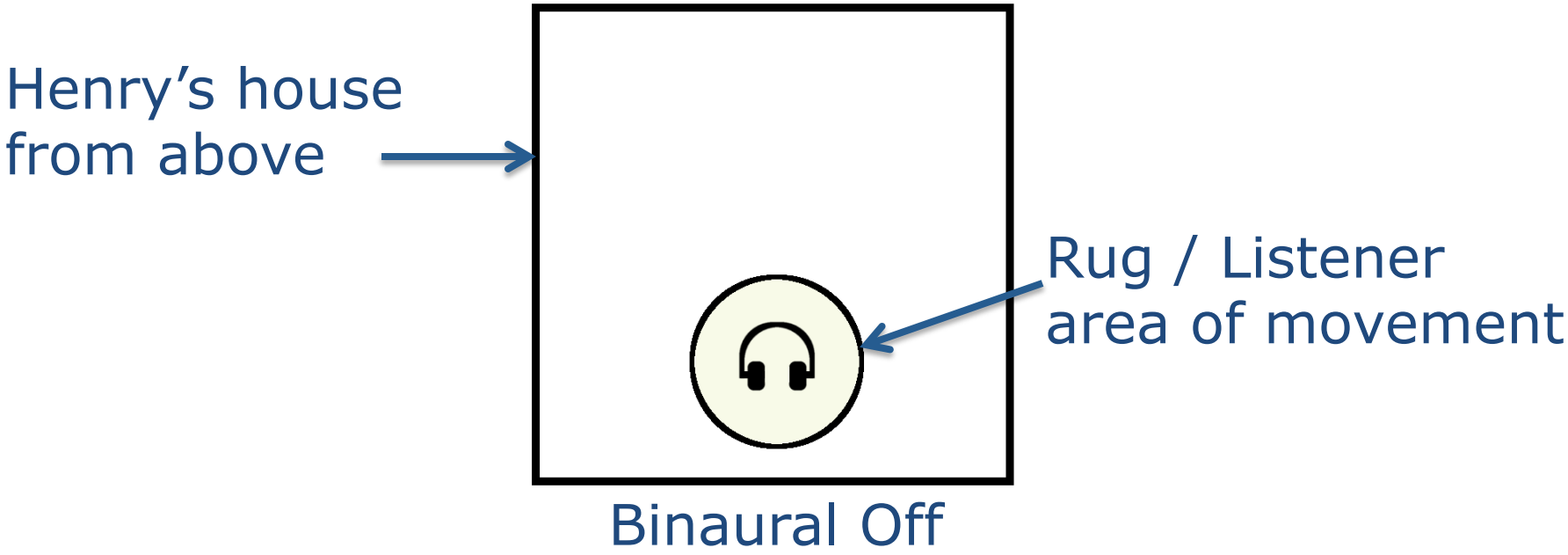
Binaural Audio

- Builds on intrinsic acoustic understanding
- Binaural audio has restrictions:
  - Every source is mono
  - Acoustically representative fall off curves
  - Accurate source placement
  - Old tricks don’t work
  - 5.1 and 7.1 (mostly) not relevant
  - Binaural recordings not so useful



Binaural Audio

Binaural Audio

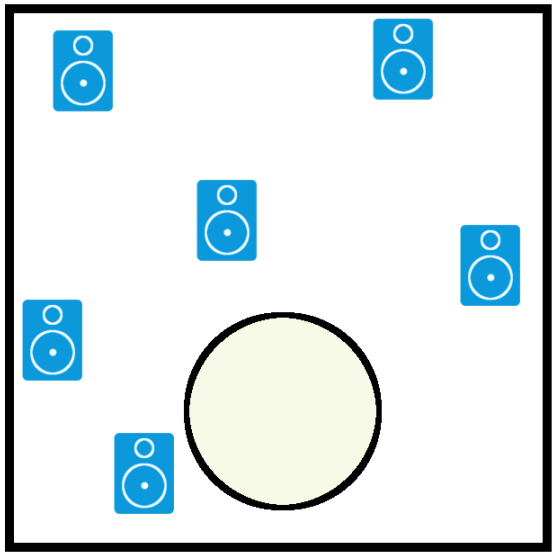


Binaural Audio

Head tracking

Listener movement

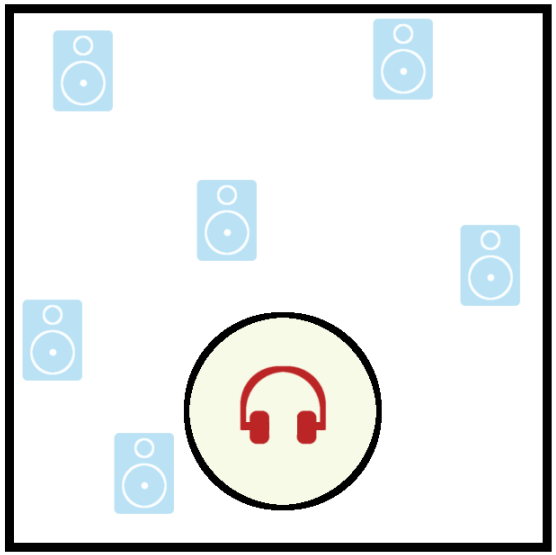
Room modeling



Binaural On

Binaural Music

2D/3D Balance Issue

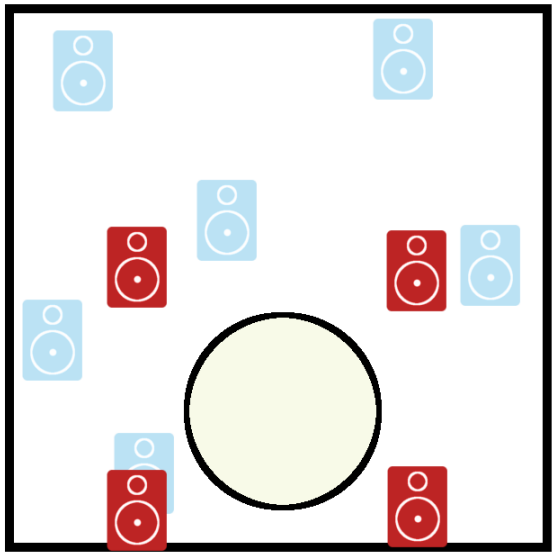


2D Music

Binaural Music

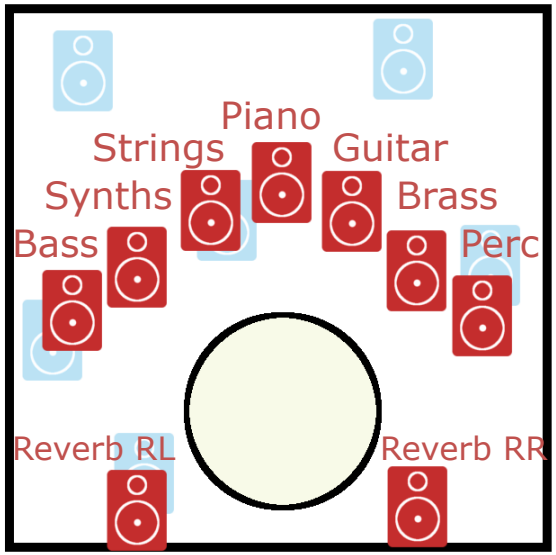
Phantom Source Issue

Source Balance Issue



Placed Quad Music

Binaural Music



3D Placed Stems

Binaural Audio

Complete Immersion

Perfect Audio Control

Acoustically accurate

Complete mix control

No mix control

Non-immersive audio

Binaural Shortcuts

- Didn’t find many
- Loudness categories
- Cognitive load
- Baked reverb on sources past apertures
- Placed Quads
- Listener relative quads

Binaural Mixing

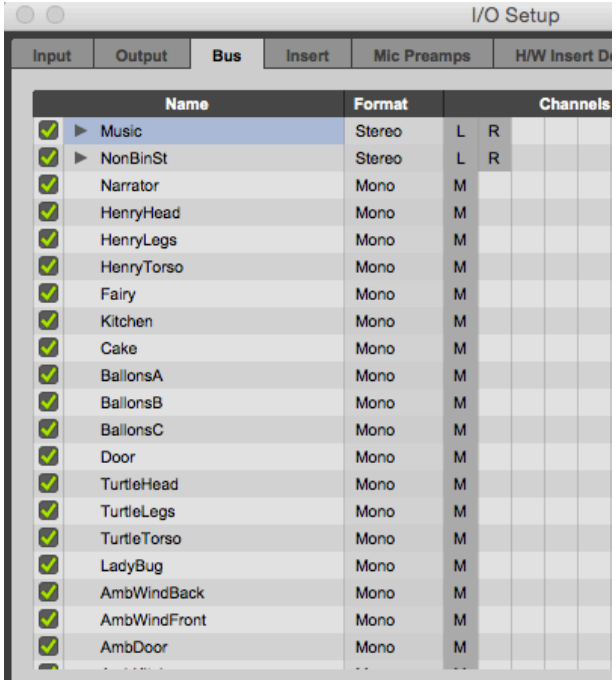
- Mixed at Skywalker Sound
- Guide Mix
- Wwise + Oculus Spatializer
- Single fall-off curve
- Loose mix for 3D / 2D balance
- Tried mixing at -24 LUFS
- Recommend approx. -18 LUFS for CV1

Game and Film Processes

- Pro Tools -> Reaper -> Wwise -> Unreal
- Edit similar to film
- Except for track layout
- Tested “Guide Mix” concept
- Reaper Render Matrix export saved time
- 42 simultaneous mono sources max

Pro Tools Setup

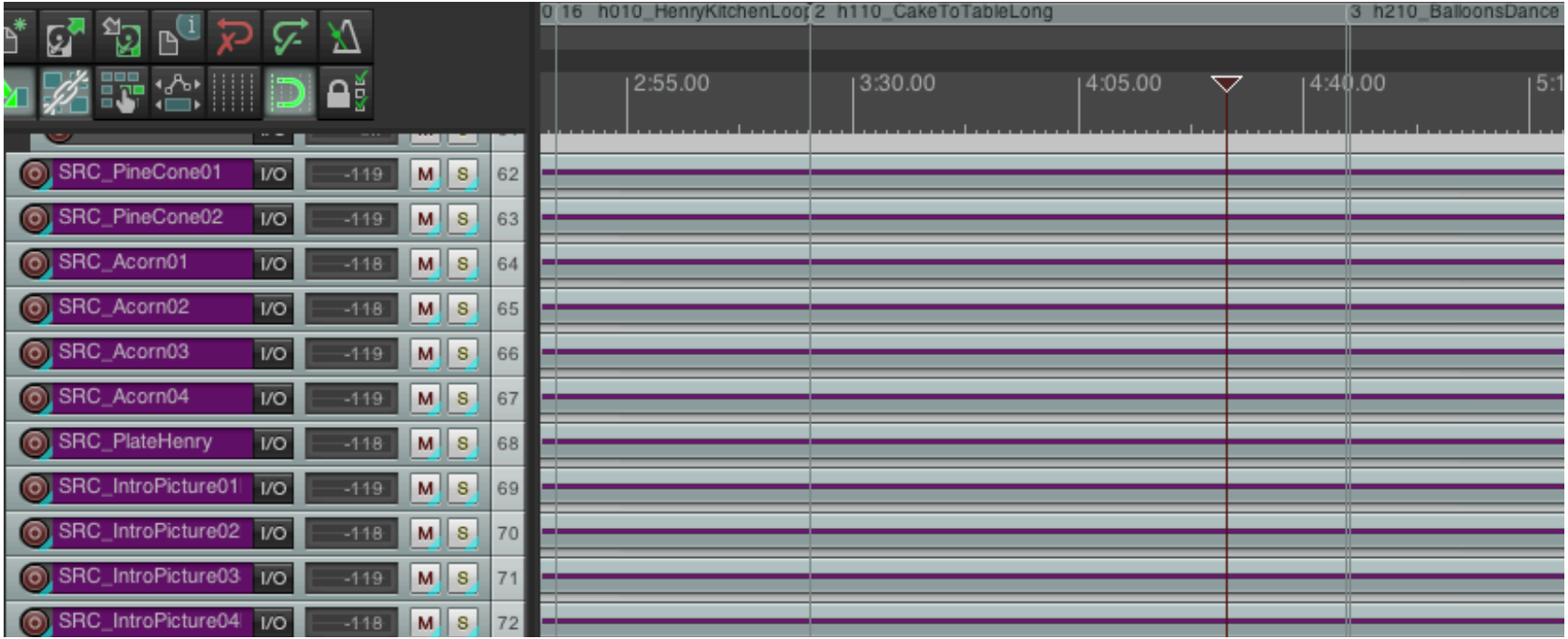
Bus = Mono Source



Reaper Setup

Shots

Mono Sources

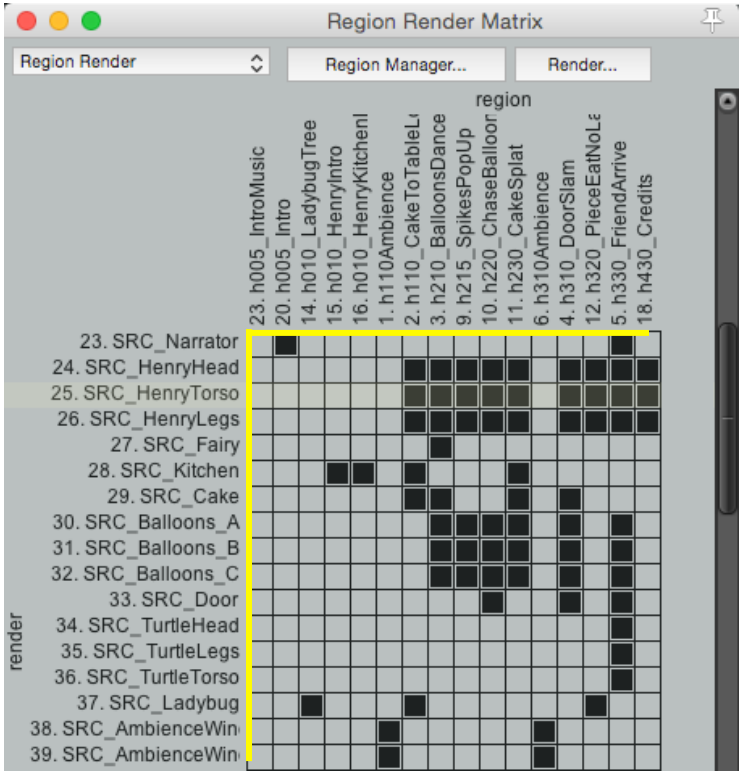


Reaper Setup

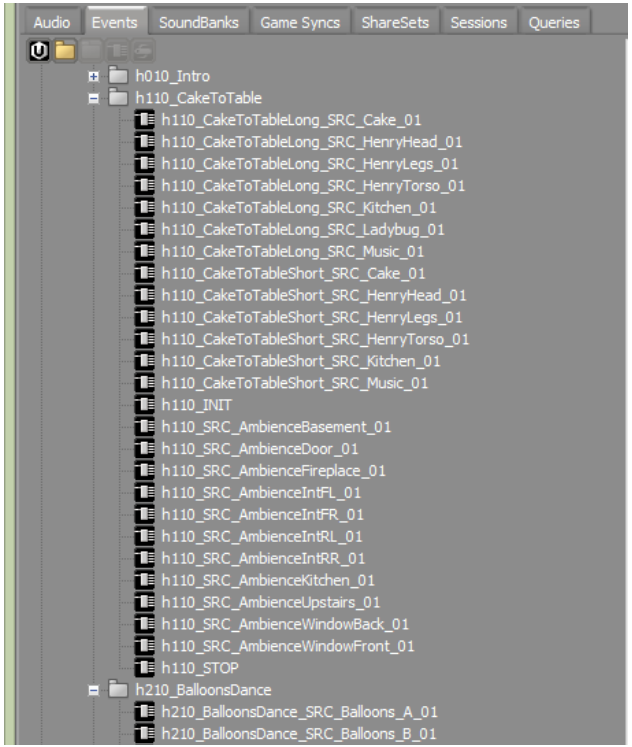
- Region render matrix auto-exports specific sources to match scene boundaries

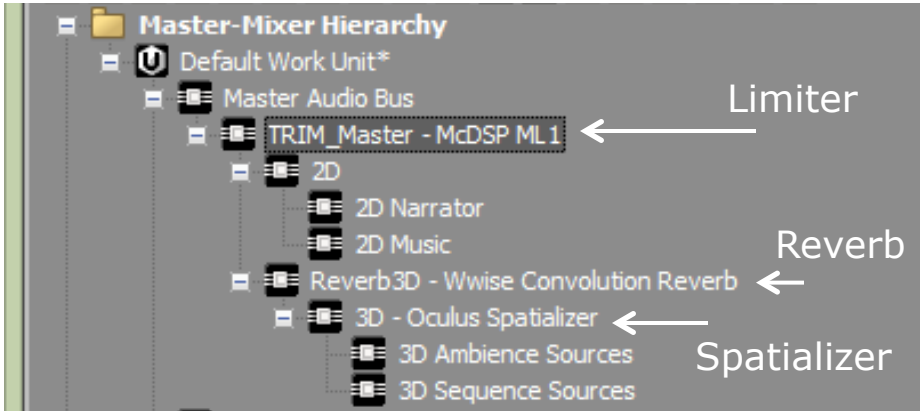
Shots

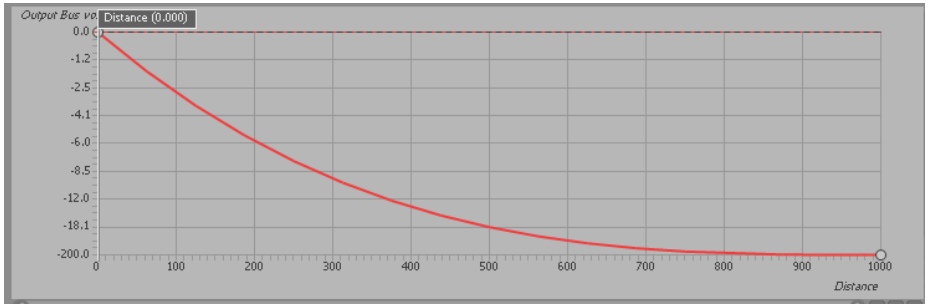
Mono Sources



Wwise Setup

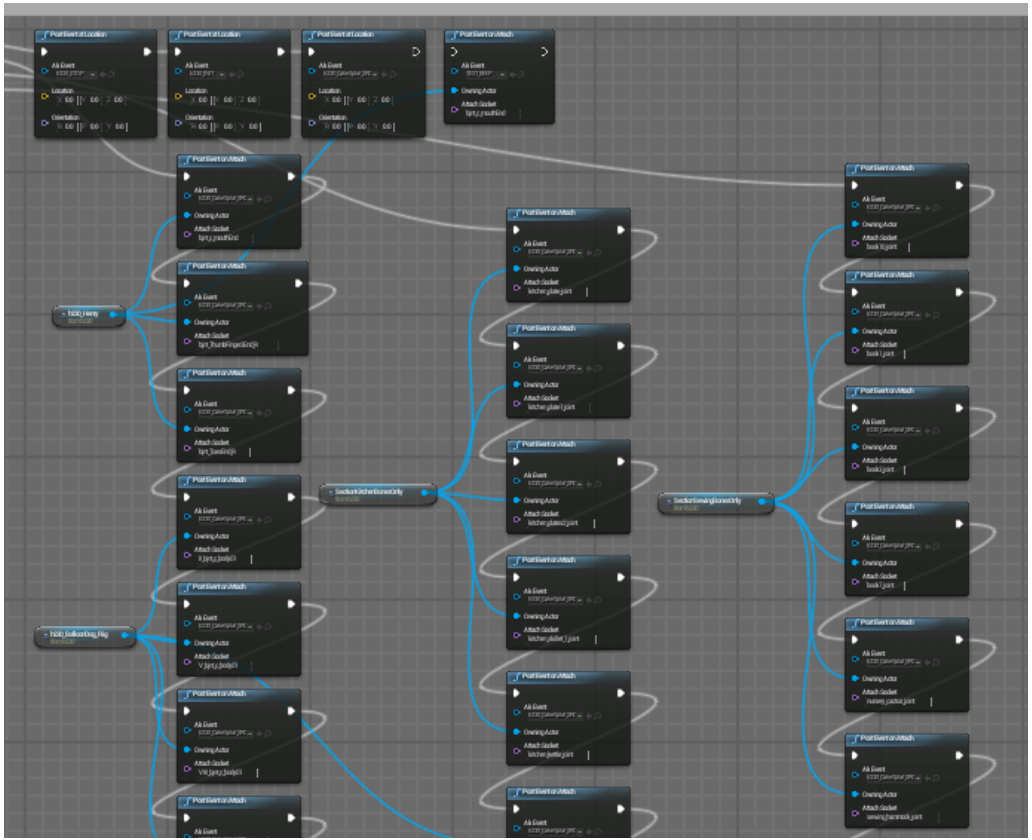

Audio
Events
SoundBanks
Game Syncs
ShareSets
Sessions
Queries
h010_Intro
h110_CakeToTable
h110_CakeToTableLong_SRC_Cake_01
h110_CakeToTableLong_SRC_HenryHead_01
h110_CakeToTableLong_SRC_HenryLegs_01
h110_CakeToTableLong_SRC_HenryTorso_01
h110_CakeToTableLong_SRC_Kitchen_01
h110_CakeToTableLong_SRC_Ladybug_01
h110_CakeToTableLong_SRC_Music_01
h110_CakeToTableShort_SRC_Cake_01
h110_CakeToTableShort_SRC_HenryHead_01
h110_CakeToTableShort_SRC_HenryLegs_01
h110_CakeToTableShort_SRC_HenryTorso_01
h110_CakeToTableShort_SRC_Kitchen_01
h110_CakeToTableShort_SRC_Music_01
h110_INIT
h110_SRC_AmbienceBasement_01
h110_SRC_AmbienceDoor_01
h110_SRC_AmbienceFireplace_01
h110_SRC_AmbienceIntFL_01
h110_SRC_AmbienceIntFR_01
h110_SRC_AmbienceIntRL_01
h110_SRC_AmbienceIntRR_01
h110_SRC_AmbienceKitchen_01
h110_SRC_AmbienceUpstairs_01
h110_SRC_AmbienceWindowBack_01
h110_SRC_AmbienceWindowFront_01
h110_STOP
h210_BalloonsDance
h210_BalloonsDance_SRC_Balloons_A_01
h210_BalloonsDance_SRC_Balloons_B_01


Master-Mixer Hierarchy
Default Work Unit*
Master Audio Bus
TRIM_Master - McDSP ML1
Limiter
2D
2D Narrator
2D Music
Reverb
Reverb3D - Wwise Convolution Reverb
3D - Oculus Spatializer
3D Ambience Sources
3D Sequence Sources
Spatializer


Distance (0.000)
0.0
-1.2
-2.5
-4.1
-6.0
-8.5
-12.0
-18.1
-200.0
0
100
200
300
400
500
600
700
800
900
1000
Distance

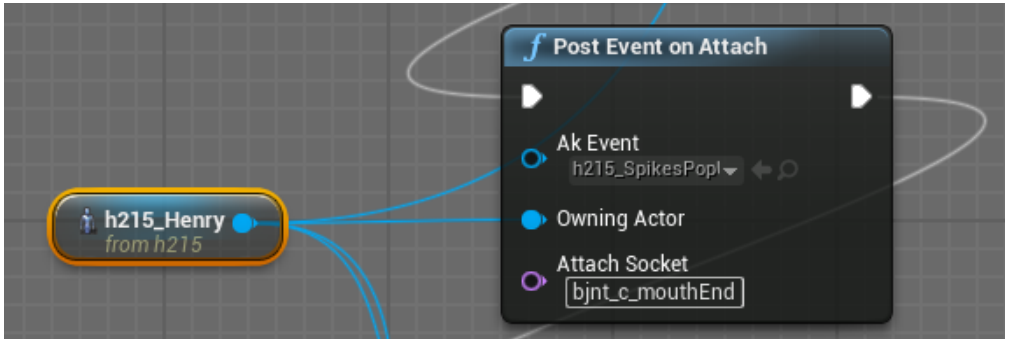
Unreal Setup

- All audio was implemented using blueprints



Unreal Setup

- Almost all Wwise events triggered using “Post Event on Attach”



  - Places sound on specific bone
  - Doesn’t break when object unloaded

Recommendations

- Reaper Render Matrix can save time
- Accurately placed mono sources
- Be aware of cognitive load
- -18 LUFS for the CV1
- Share the shortcuts you find!

What's Next?

- Greater interactivity
  - Interactivity breaks elements of the film production model
- Real Time Mixing
  - HDR
  - Something different

Any Questions?

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