

Portfolio Technical Set-up Information

The main portfolio works are intended for performance in the Ambisonic Suite at the University of Derby, UK (MS216). Although performing these works in a different 3D audio-equipped space will not diminish their value as musical expressions, it will substantially change an important aspect of each piece that interacts with its spectral and temporal qualities. For optimal results, listen in the intended performance space or a similar one and adhere to the technical setup guidelines provided below.

The Reaper sessions for works 1-8 utilise WigWare's third-order Ambisonic plugins, while work 9 utilises the IEM plugin suite. Both can be downloaded using the following links:

https://www.brucewiggins.co.uk/?page_id=78
<https://plugins.iem.at/>

Setup information:

The portfolio works use a **hybrid 3D audio reproduction system** consisting of a **32-speaker third-order Ambisonic Array**, a **4-speaker quadrophonic extension**, and an **overhead stereo pair** directly above the listener. This physical setup is shown in the picture below and on the final page.



Central listening
position

The quadraphonic rig is arranged around the central listening position in the following locations: front, back, left, and right. Each speaker is 1.5 meters from the central listening position and 3 meters apart.

The Ambisonic Suite at the University of Derby has the following routing :

Channels 1-16 are used for Stereo and Dolby Atmos.

Channel 4 is the LFE.

Channels 9-10 are the ceiling speakers.

Channels 5-6 are used for the inner speaker array, front (5) and back (6).

Channels 7-8 are used for the inner speaker array, left (7) and right (8).

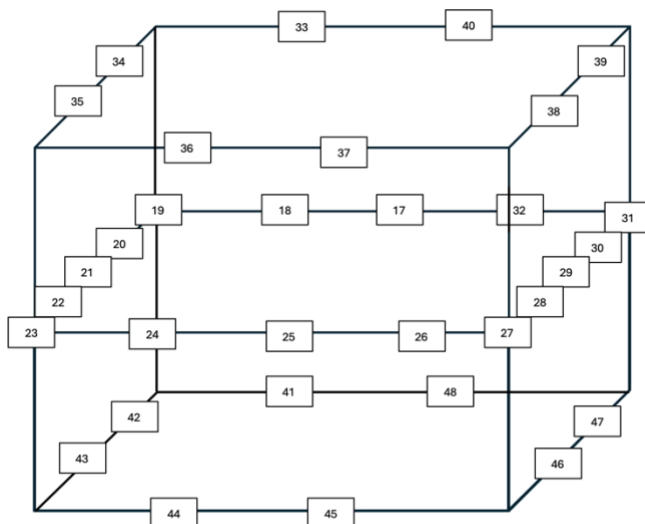
Channels 17-32 are designated for the middle ring and are arranged in an anti-clockwise direction from the centre front.

Channels 33-40 are designated for the top ring and are arranged in an anti-clockwise direction from the front left.

Channels 41-48 are designated for the floor ring and are arranged in an anti-clockwise direction from the front left.

NOTE:

The routing in each downloadable Reaper session is based on the above channel routing. Within each piece, certain sounds are directed to specific speaker locations, such as the inner speaker array. Other sounds use a combination of discrete speaker placements and ambisonic panning to create defined sound shapes. **Before performing each piece in a new performance space, it's essential to check each track for any additional routing to individual speakers and ensure that the new routing aligns with the original intended placement of the sounds.**



Reaper session Setup:

Each Reaper session consists of the following tracks:

Track 1: UHJ Encoder/Transcoder

Track 2: 3rd Order Ambisonic Decoder

Track 3: Total 3rd Order Bus

Track 4: 1st Order Reverb Bus

Track 5: 3rd Order Dry Bus

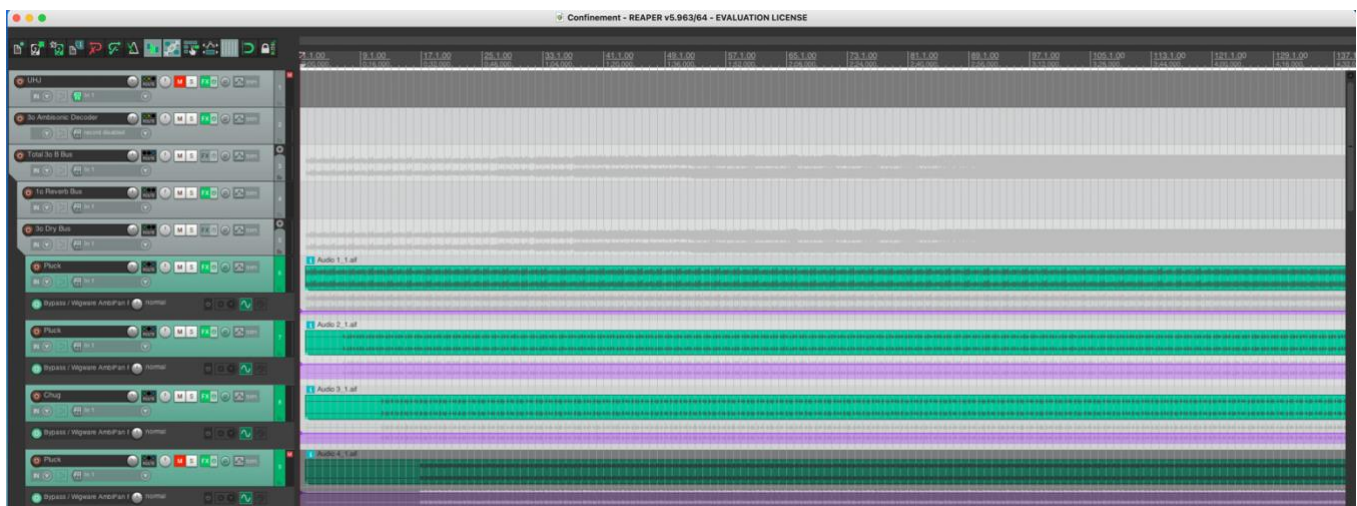
The remaining racks are for audio stems to be spatialised.

The session uses hierarchical routing. Each audio track is routed to tracks 4 and 5, which are then routed to track 3 (Total Third-Order Bus).

The Total third-order bus is then sent to tracks 1 and 2. Track 2 is a third-order ambisonic decoder for playback in the performance space, and track 1 converts the total bus to B-format 4-channel audio for stereo and binaural reproduction.

The Ambisonic Decoder used on Track 3 can be replaced with a different plugin to suit a different room or setup. An alternative would be the IEM Plugin Suite's AIRADecoder, which can be downloaded via the following link:

<https://plugins.iem.at/download/>

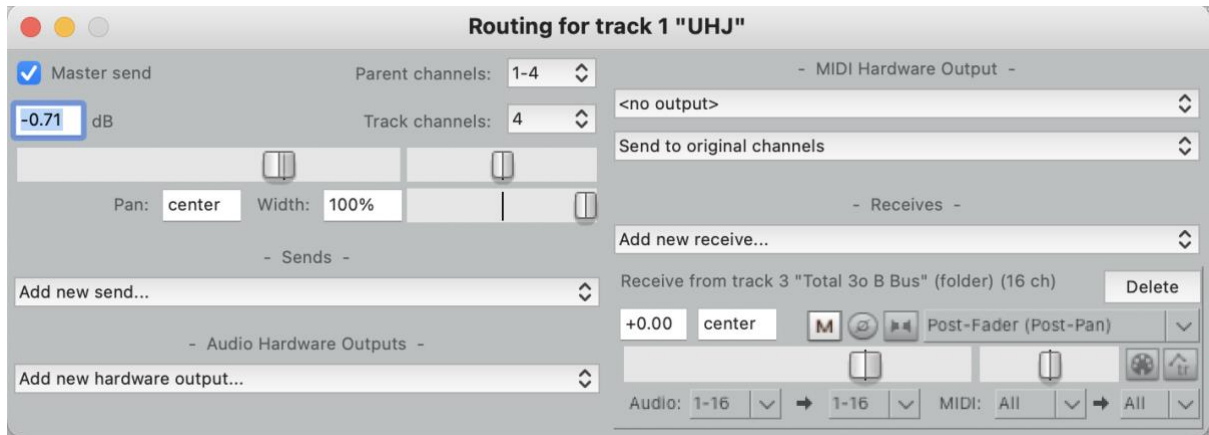


Please note that the Reaper session for 'Song No.9' uses the IEM Plugin Suite instead of WigWare plugins.

Routing Setup

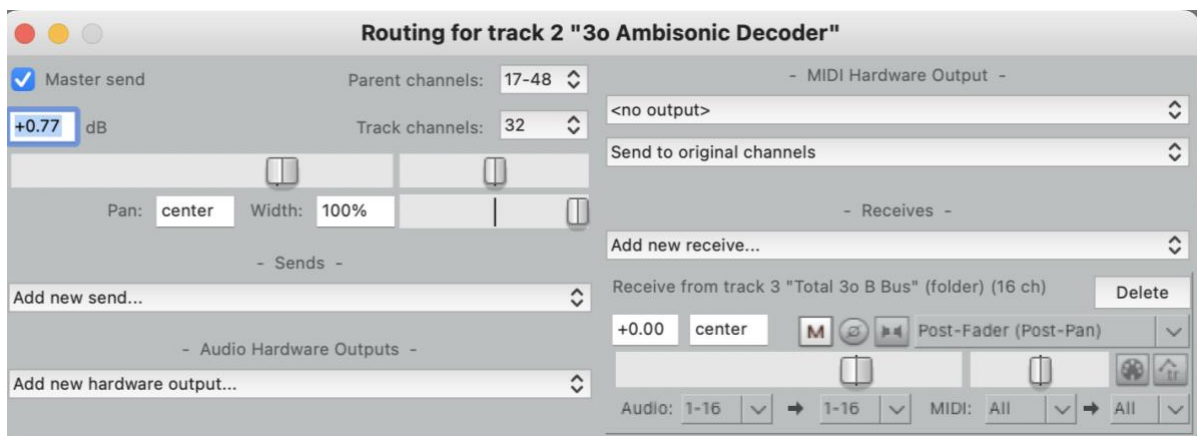
- Track 1: UHJ Encoder/Transcoder

Track 1 receives from the total third-order bus (track 3). It is set to 4 track channels using parent channels 1-4. The master send box is ticked (see below).



- Track 2: 3rd Order Ambisonic Decoder

Track 2 is set to 32 track channels, using parent channels 17-48. It receives from the Total 3rd order Bus (track 3).



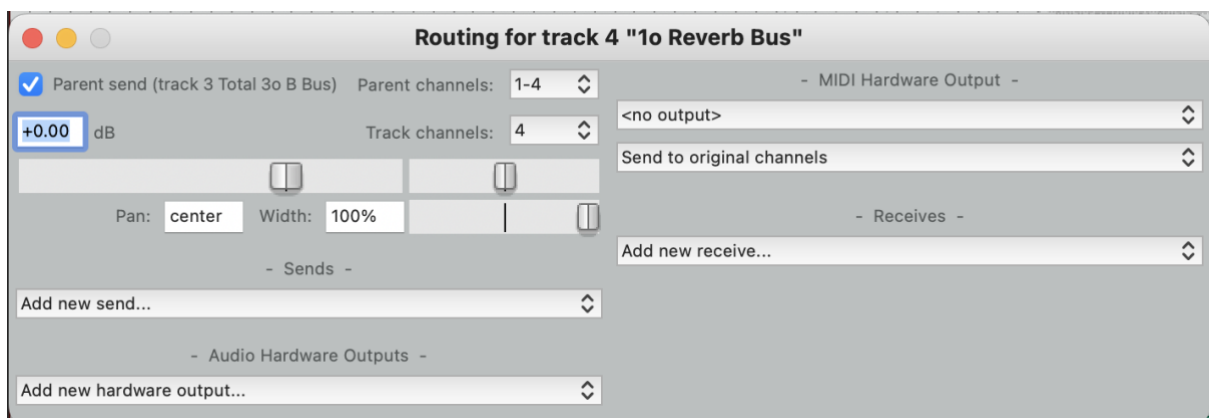
- Track 3: Total 3rd Order Bus

Track 3 has all the remaining channels routed into it using hierarchical routing within Reaper. It is set to 16 track channels using parent channels 1-16. Track 3 is sent to tracks 1 and 2.



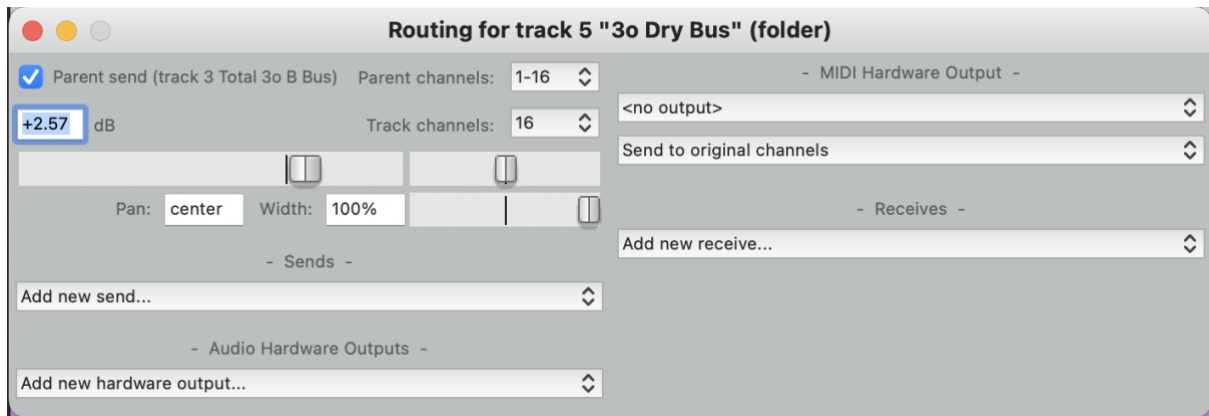
- Track 4: 1st Order Reverb Bus

All audio stem tracks are routed into tracks 4 and 5 using hierarchical routing in Reaper. Track 4 uses the below settings:



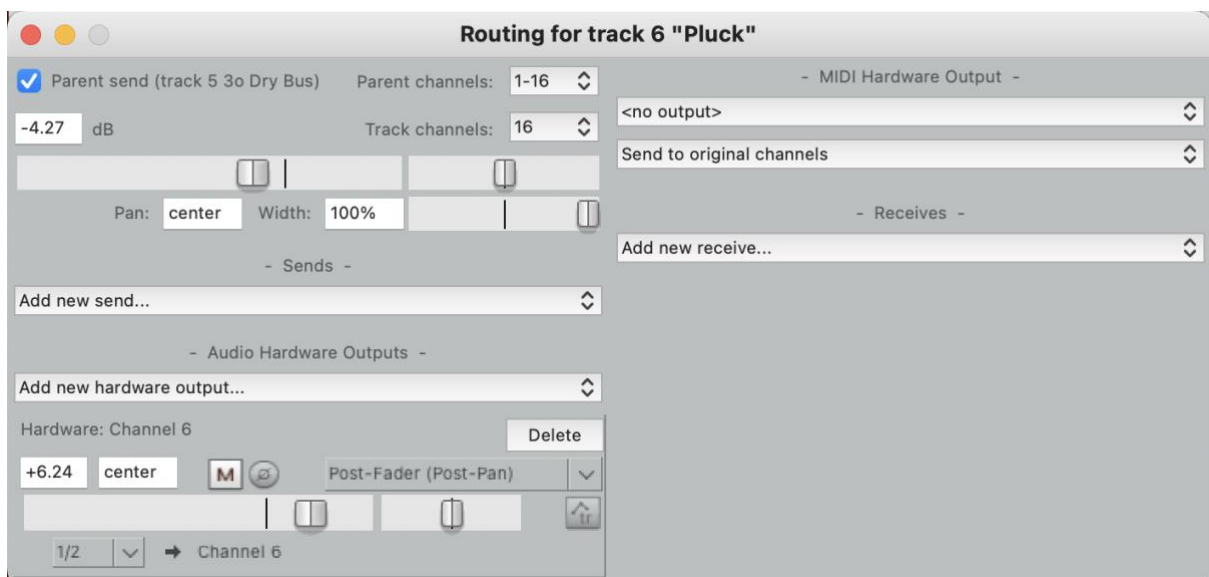
- Track 5: 3rd Order Dry Bus

All audio stem tracks are routed into tracks 4 and 5 using hierarchical routing in Reaper. Track 5 uses the below settings:



- Audio Stem Tracks

Using hierarchical routing in Reaper, each audio stem track is routed to tracks 4 and 5 and then track 3. In the example below, the audio stem is also routed directly to channel 6.



Channels for each section of the Hybrid setup:

Ambisonic Array: Channels 17-48

Inner Quadrophonic array: Channels 7-8

Overhead Stereo Pair: Channels 9-10

See the next page for a diagram of the audio reproduction setup.

Ambisonic Array
Channels 17-48

Overhead Stereo Pair
Channels 9-10



Inner Quadrophony Speaker setup
Channels 5-6 (F-B), and 7-8 (L-R).