

IMMERSIVE 3D AUDIO
TOTAL CONTROL

DEARREALITY



USER MANUAL

V2.0.0

Please read this manual carefully before using the software.

Using headphones requires responsible listening!

Last updated: January 2024

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DEARVR PRO2

Quick Start Guide

Install and Authorize Your new Plugin:

Double-click the .pkg (Mac) or .exe (Win) file.

Follow the installation instructions.

Open the plugin in your DAW of choice, enter your license code and click on ACTIVATE.

For more information, please visit: www.dear-reality.com

System Requirements and Supported Platforms

Supported sample rates:

44.1, 48, 88.2, 98, 176.4 and 192 kHz

Supported Buffer Sizes:

128 Samples or higher

For latest System requirements & Supported Platforms, please check the product on our website.

DEARVR PRO2

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1 Introduction

Thank you for purchasing our dearVR PRO 2 Plugin and welcome to the next step of immersive audio production. With the dearVR 3D audio technology you are able to design fantastic new music mixes for headphones or create deep auditory worlds and sound design within your DAW.

This manual will help you understand the dearVR PRO 2 Plugin and how to use it in your projects.

Important Note:

dearVR is a 3D audio technology for headphones. Any kind or brand will do, but if the output format is set to “Binaural”, you have to use a headphone for the plugin to work properly. Please check that your left and right earpieces are properly placed and let’s get started…

Have fun!

1.1 About Binaural 3D Audio

Binaural 3D Audio is a technology that simulates the human spatial hearing via headphones. If you listen to common stereo audio with headphones, the perception of all sound sources is located inside your head - between your left and your right ear. With 3D Audio you get the sound outside of your head where it belongs. A sound appears to emanate from a specific point - anywhere within a full 360° three-dimensional sphere.

This gives you the ability to position a sound object all around the listener - behind, in front of, to the right or to the left of and even below or above.

The quality of a 3D Audio rendering process depends on many factors - primarily the shape of our body, our head, and our ears. That’s why a mix with 3D Audio can sound different to

different people. Our uniqueness as human beings is actually a limitation for practical 3D Audio technology.

Another typical problem that occurs with binaural 3D Audio is the front-back confusion. Our natural hearing uses small micro-movements of our head to optimize the localisation of a sound source. The head tracking technology, which is part of virtual reality devices, offers a solution to this problem.

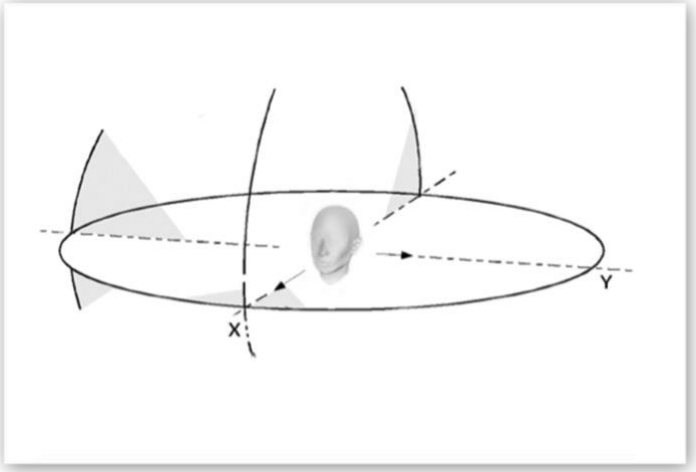


Illustration 1.1 - Full 360-degree 3D audio sphere

Binaural 3D Audio is not made for listening via stereo speakers. Although in general the playback is possible, you will have to face strong colorations of the sound depending on your playback system. The reason for this is crosstalk, meaning a large portion of the left speaker signal will also go to the right ear of the listener. Similarly, a large portion of the right speaker signal will go to the left ear of the listener. With headphones this is different: both the left and the right channel signal reaches its respective ear.

1.2 dearVR Audio Reality Engine

We call our dearVR technology an audio reality engine because it can produce stunningly realistic auditory worlds, comparable to our natural listening. For this, we listened back to our modelling technology over and over again and tweaked every parameter with our own ears.

The acoustic modelling of an environment needs more than just 3D spatial location. It combines distance, motion, reflections and reverb to complete a simulation of an acoustic scene.

All these phenomena can now be utilized for your sound design with just one plugin:

The dearVR audio reality engine!

2 Overview dearVR Engine

The dearVR PRO 2 Plugin is a 3D audio processor, enabling you to virtualize many different kinds of three-dimensional acoustic settings within your mix with a great amount of realism.

The virtualisation of an acoustic environment with object-based sound sources refers to combining 3D spatial location cues with distance, motion, and ambience. All these parts are needed to achieve a realistic simulation of an acoustic scene - far beyond simple 3D positioning.

For this reason, the dearVR Engine combines object-based 3D positioning with real time generated reflections depending on the room positioning and late diffuse reverberation.

2.1 Reflections

A signal being reflected once or twice from parts of a listening space - walls, ceilings and floor - arrives shortly after the direct signal at the listener's position. Such early reflections can be seen as a transition period before the reverberant field has built up.

First reflections are responsible for our impression of the general character and the size of a room. These reflections are of great importance in binaural rendering in order to create a realistic localisation and the impression of sounds coming from outside of your head.

Early reflections can be modelled by considering acoustic boundaries as acoustic mirrors. Depending on the listener's position in a room and his/her distance to the boundaries, the time a reflection takes to arrive at his/her ears varies. Reflections also vary depending on the position of the sound source in the room.

2.2 Reverb

Reverb itself is an extremely complex reflection and diffusion pattern that builds up to a dense thickness from the moment you hear the original dry sound. For the dearVR Engine we captured the acoustic characteristics of different rooms or locations. The dearVR PRO 2 plugin contains a selection of 46 room presets for spatial audio production. You can easily adapt these reverb characteristics for your mix by changing the reverb size or applying a reverb filter.

3 Control Panel



Illustration 3.1 - Overview processing units

The dearVR PRO 2 plugin is made up of four processing units:

1. Position
2. Reverb
3. Reflections
4. Master

The signal flow starts in the Position Module, passes through the Reflections and Reverb sections and ends with the Output Format in the Master Module. Each module has a Gain controller before the signal enters the following section.

3.1 Position

The Position module renders distance, listening angle and elevation relative to the listener. It is possible to enter values as Polar or Cartesian coordinates.

Important: **Azimuth, Distance and Elevation sliders (Polar Coordinates) are only active in Polar Mode (see 1 – Input Mode)**

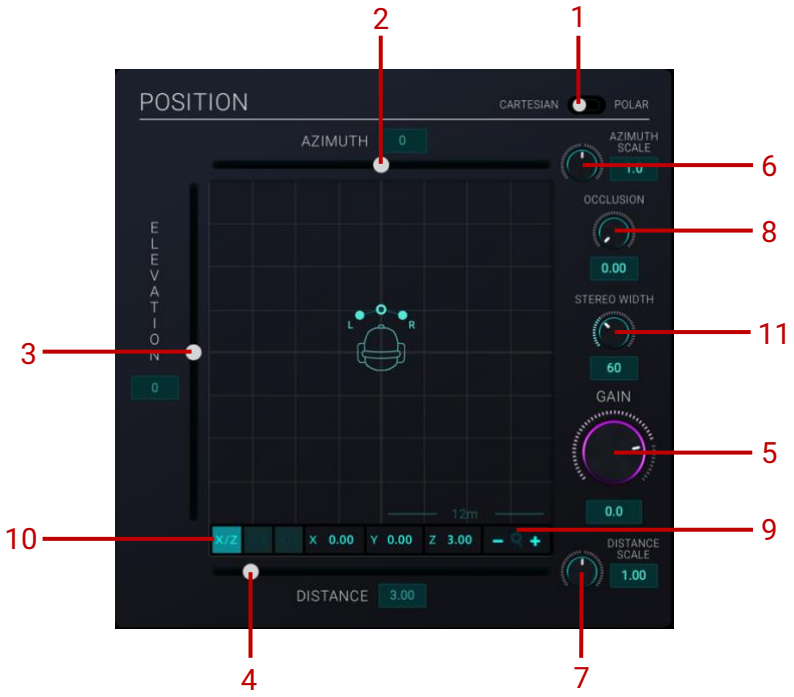


Illustration 3.2 - Position module

1 - Input Mode Use toggle to switch between **Cartesian** or **Polar Mode**.

1. Cartesian Mode

Cartesian Coordinates X, Y, Z represent distances from the listener.

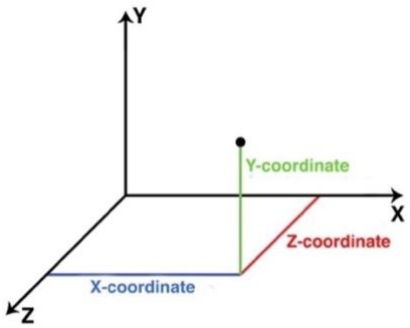


Illustration 3.3 - Cartesian Coordinates

In Cartesian Mode, change position by dragging the audio source icon with the mouse in the XYZ-Pad. You can also enter numeric value into the XYZ display field.

2. Polar Mode

Azimuth and Elevation parameter describe an angle in degree, whereas Distance is set in meter (length of vector *r*)

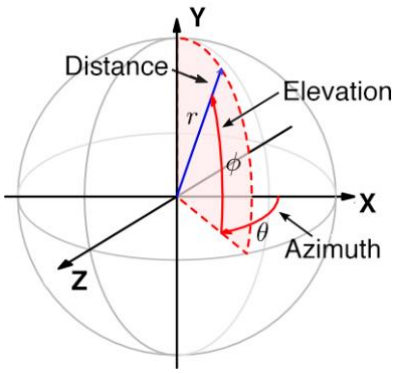


Illustration 3.4 - Polar Coordinates

In Polar Mode, change position with the Azimuth, Elevation and Distance sliders. You can also enter numeric value into the display fields next to the sliders.

Note: It is not possible to drag the audio source icon with the mouse while being in Polar Mode. A red position marker together with the note “POLAR” will appear.



Illustration 3.5 - XYZ-Pad input disabled

2 - Azimuth

Set Input Mode to Polar and use the Azimuth Slider to enter the left/right position in degrees (+/- 180°).
Use display next to the Azimuth slider to enter numeric values.

Note: Slider is disabled if Input Mode is set to Cartesian!

3 - Elevation

Set Input Mode to Polar and use the Elevation Slider to enter the object height in degrees (+/- 90°).
Use display next to the Elevation slider to enter numeric values.

Note: Slider is disabled if Input Mode is set to Cartesian!

4 - Distance

Set Input Mode to Polar and use the Distance Slider to enter the object distance (max. 30 meter).
Use display next to the Distance slider to enter numeric values.

Note: Slider is disabled if Input Mode is set to Cartesian!

5 - Gain

Sets the level of the audio source direct signal - independent of reflections and reverb gain. (-96dB ⇔ +24dB)

Note: Values for direct, reflection and reverb levels influence the distance perception.

6 - Azimuth Scale

Scale the internal dearVR horizontal-angle processing.
Values: (0.2 ⇔ 4.0)

Note:
Value < 1.0 results in more sideways position perception.
Value > 1.0 results in more centred position perception.

7 - Distance Scale

Multiplier for the internal dearVR distance processing. The processed distance is calculated by distance * distance scale.
Values: (0.01 ⇔ 10.0)

Note:
Value > 1.0 lead to an increased distance perception.
Value < 1.0 lead to a decreased distance perception.

8 - Occlusion

Acoustic occlusion describes the alteration within a sound field if the sonic wave is blocked by an object or wall. Occlusion Knob sets the level of occlusion if a sound source is occluded by an object.
Values: (0.0 ⇔ 1.0)

9 - Zoom +/-

Use plus / minus buttons to zoom In or Out.
There are six different zoom stages:
3m / 6m / 12m / 18m / 24m / 30m

10 - Display Mode (X/Z Y/Z X/Y)

Switch between three different Display Modes:

X/Z is a top view.

Y/Z is a side view.

X/Y is a rear view.

Note: The Icon in the middle of the Display gives a quick overview of the chosen mode.

11 – Stereo Width

If dearVR PRO 2 is inserted on a stereo track, you can use the Stereo Width knob to alter the width. You will see two dots labelled

with L and R to visualize the position of the left and right channel.

If the plugin is inserted on a mono track, the knob is greyed out and only the mono source is spatialized.

In DAWs like Reaper, where there is no clear distinction between mono and stereo tracks, the knob won't be greyed out ever. If you use a mono audio source, set the Stereo Width to 0.

Tip – Shortcut Reset Position
Press ALT and double-click into the XYZ display to reset the source position to default values.

3.2 Reflections

The reflections module generates reflection patterns depending on the sound source position. If the sound object moves, the reflection pattern adapts to the direction of the signal.

With Realtime Auralisation, it is possible to create real-time reflections depending on the sound source position and distance relative to six walls: Left, Front, Right, Top, Back, Bottom. Walls are indicated within the XYZ-Pad using narrow lines.

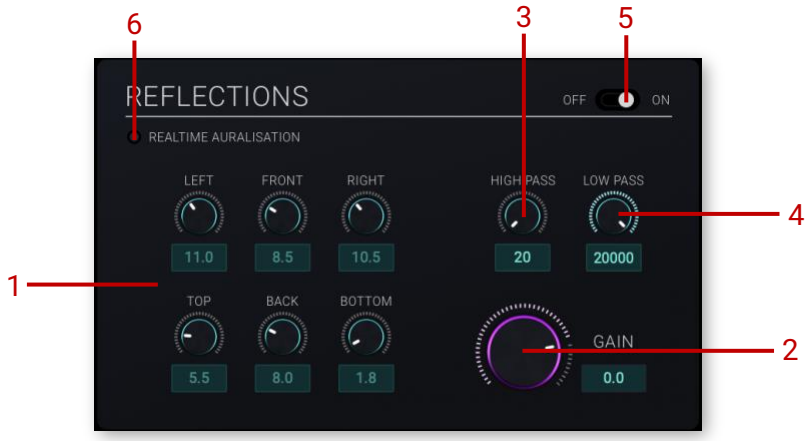


Illustration 3.6 - Reflections Module

1 – Wall Distance	Listener's distance to the ceiling / ground in meter Listener's distance to the front / rear wall in meter. Value modifies delay and level of reflexion from front / rear direction. Listener's distance to the left or right wall in meter. Value modifies delay and level of reflexion from left / right direction.
2 - Reflections Gain	Adjusts the overall gain of the reflections section. Values (-96dB ⇔ +24dB)
3 - Reflections High Pass	Applies a high-pass filter to the reflections. Set frequency values between 20 Hz to 20000 Hz.
4 - Reflections Low Pass	Applies a low-pass filter to the reflections. Set frequency values between 20 Hz to 20000 Hz.
5 - Reflections On/Off	Switch to turn ON/OFF the reflections rendering.
6 – Realtime Auralisation	Activates real-time processing to generate first reflections corresponding to the listener and sound object position relative to the chosen wall distances. Value 0 means no boundary.

3.3 Reverb

For the reverb module we created 46 Virtual Acoustic presets, capturing the characteristics of different rooms and locations. You can easily adapt these acoustics to a specific scene or room by changing the size or applying the damping filter.

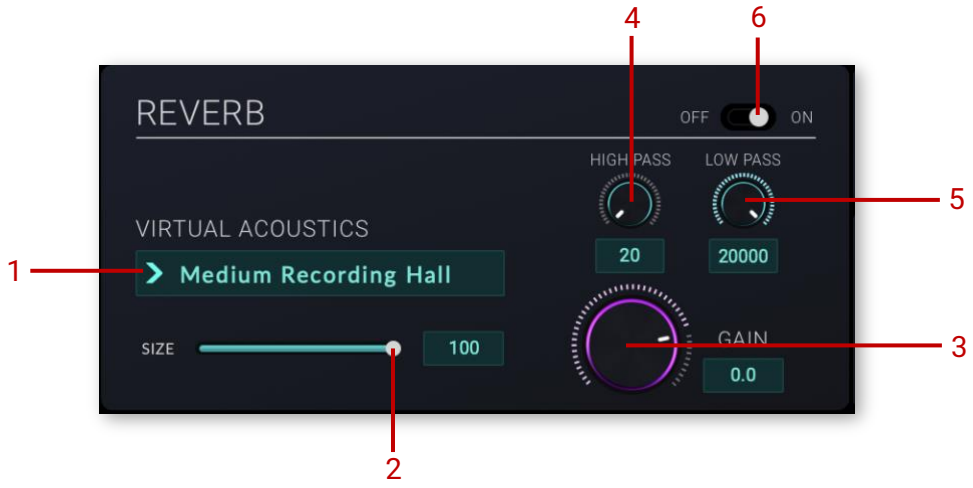


Illustration 3.7 - Reverb Module

1 - Preset Menu to select different Virtual Acoustic room presets.
For an overview and detailed description of all presets see chapter 4. Preset List.

2 - Size Slider to decrease the reverb time of the selected preset.
Values (50% ⇔ 100%)

3 - Reverb Gain Adjusts the overall gain of the reverb section.
Values (-96dB ⇔ +24dB)

4 - Reverb High Pass Applies a high-pass filter to the reverb.
Set frequency values between 20 Hz to 20000 Hz.

5 - Reverb Low Pass Applies a low-pass filter to the reverb.
Set frequency values between 20 Hz to 20000 Hz.

6 - Reverb On/Off Switch to turn ON/OFF the Reverb rendering.

4 Master

The Master module is responsible for defining input, output and general options like bypass and performance mode.



Illustration 3.8 - Master Module

1 - Output Format Select Output Format:

We provide 34 different output formats for you so you can select the perfect one for you. There is the binaural option, 6 Ambisonics formats and 27 multichannel formats for you to choose from. You can find the different channel layouts for each format in the appendix.

2 - Master Gain Sets the overall output gain.

Values (-96dB ⇔ +24dB)

3 - LFE Sets the LFE output level when using a multichannel configuration with an LFE.

4 - Clarity

Clarity is an algorithm by Sennheiser Ambeo, which lets you control the amount of HRTF influence on the frequency response that is being applied to your binaural output signal. The Clarity feature is only available in binaural output mode.

Note:
Value 0: maximal localization and externalization
Value 100: minimal colorization of the HRTF, but less stable localization and externalization



Illustration 4.6 – Clarity Visualization

Note:
For our spatialization several HRTFs are used. As a graphical simplification only one HRTF is shown in the visualization of the Clarity feature.

5 - Bypass

Bypass all dearVR processing.

6 - Bass Boost

Enable bass enhancement on the input signal.

7 - Performance Mode	Use Performance Mode for static, non-moving audio sources, to reduce processing load. **Note:** Only enable for non-moving objects. Moving the audio source while Performance Mode is active might cause glitches.
8 - Head Tracking	Signal LED is illuminated if Head Tracking is controlled by dearVR SPATIAL CONNECT software or a third party headtracker. For more information see chapter 9 in this manual.

5 3D Audio Formats and When to use what

Our plugin dearVR PRO 2 offers three different kinds of 3D audio formats:

1. Binaural
2. Ambisonics
3. Multichannel

To give you an overview about when to use which one, we briefly describe how they work and what kind of setup an end user needs to listen to the formats. In the following chapters you will find examples on how to use our plugin with each workflow.

5.1 Binaural

In our introduction we already covered a lot about binaural audio. The essence is, that binaural audio is ONLY working when listening to it on headphones. It is a two-channel audio format and therefore the workflow is as if you would make a stereo mix.

5.2 Ambisonics

The Ambisonics format is a more abstract one. Without going into the technical details, the most important details are that there are multiple orders of Ambisonics. The higher the order, the better the resolution of the 3D audio space. With the orders, the channel count also grows, starting at 4 channels for 1st order and going up to 9 and 16 channels for 2nd and 3rd order. When mixing in Ambisonics, an Ambisonics decoder is necessary to listen to the mix (e.g., our plugin dearVR AMBI MICRO). The end user would also need an encoder for

his/her setup to listen to the mix. Facebook and Youtube already offer a native 1st order Ambisonics support and convert it back to binaural 3D audio.

5.3 Multichannel

dearVR PRO 2 has the capability to encode lots of 3D audio speaker setups, starting from well-known cinema formats (e.g., 5.1, 7.1) and going up to 9.1.6 or 13.1. The end-user would need such a speaker setup to listen to your mix, which might be in a cinema with such a system or a bigger multichannel control room. If you don't have such a big studio to mix in we also offer our plugin dearVR MONITOR which you can use to listen to your multichannel output on headphones using binaural 3D audio.

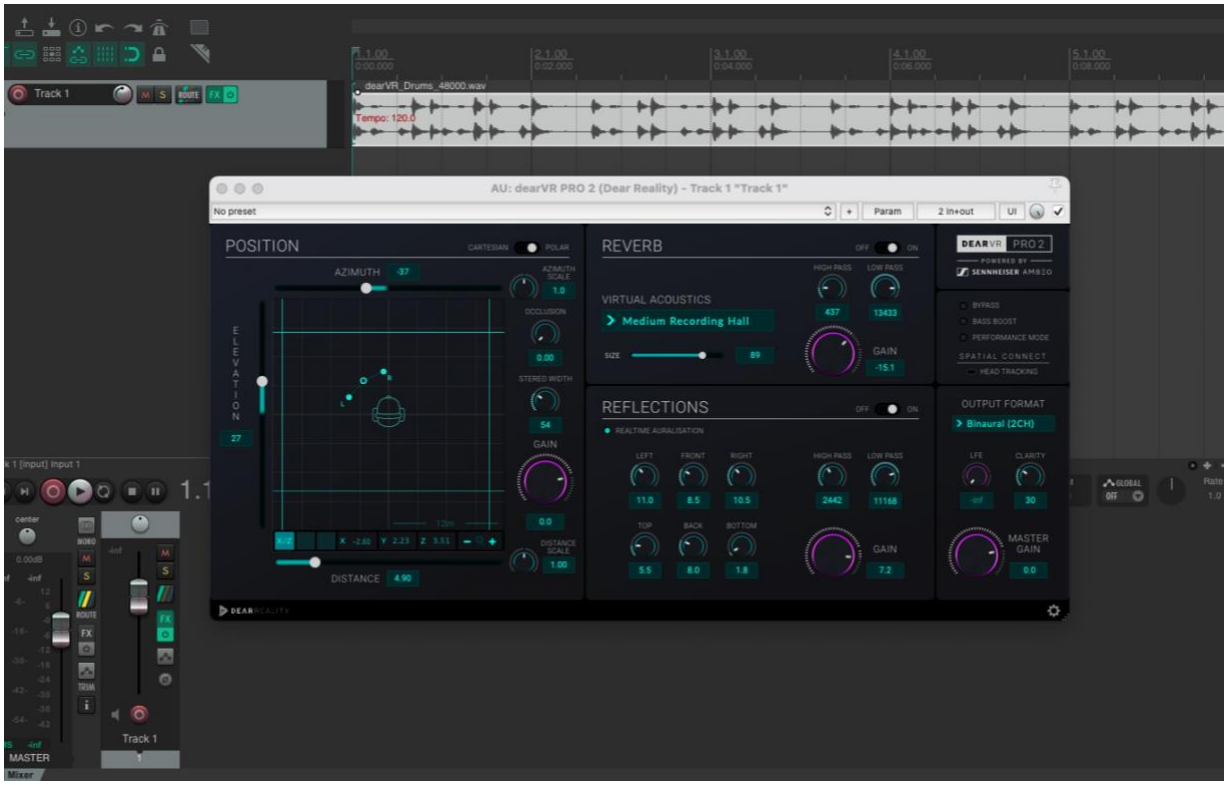
5.4 Dolby Atmos

In Dolby Atmos there is a distinction between the Dolby Bed, which uses a channel-based workflow, and Audio Objects, which additionally use meta-data. dearVR PRO 2 can be used to encode tracks for the Dolby Bed. It is not possible to write meta-data with dearVR PRO 2, and hence it can't be used for the spatialization of audio object.
Atmos can be decoded different speaker setups and accordingly the format of the Dolby Atmos bed changes. If you don't have a multi-speaker setup in your studio, you can use dearVR MONITOR to listen to your multichannel output on headphones using binaural 3D audio.

6 Binaural Workflow

Since the Binaural workflow is very similar in all DAWs, we will describe this once with Reaper as an example.

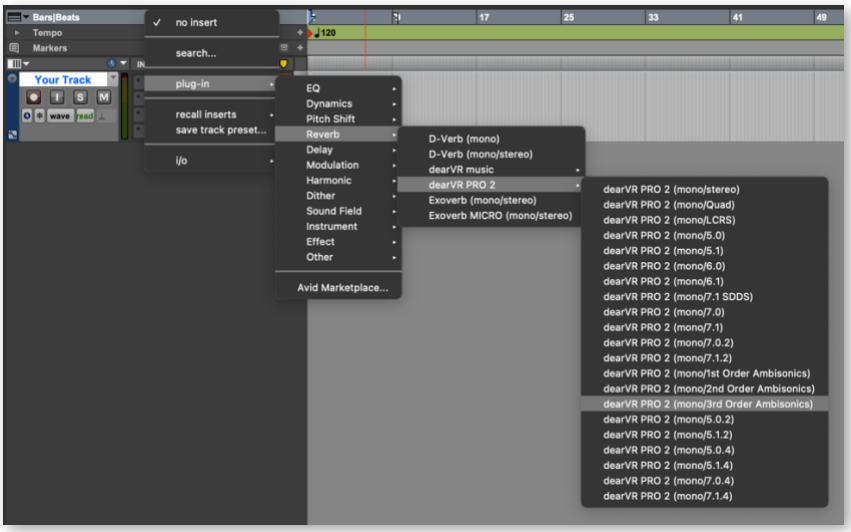
1. Create a track and put an audio file on it.
2. Load dearVR PRO 2 plugin on the track
3. Position your sources, add reverb and reflections
4. Sum all binauralized stereo signals on one stereo bus
5. Listen to that bus with headphones.



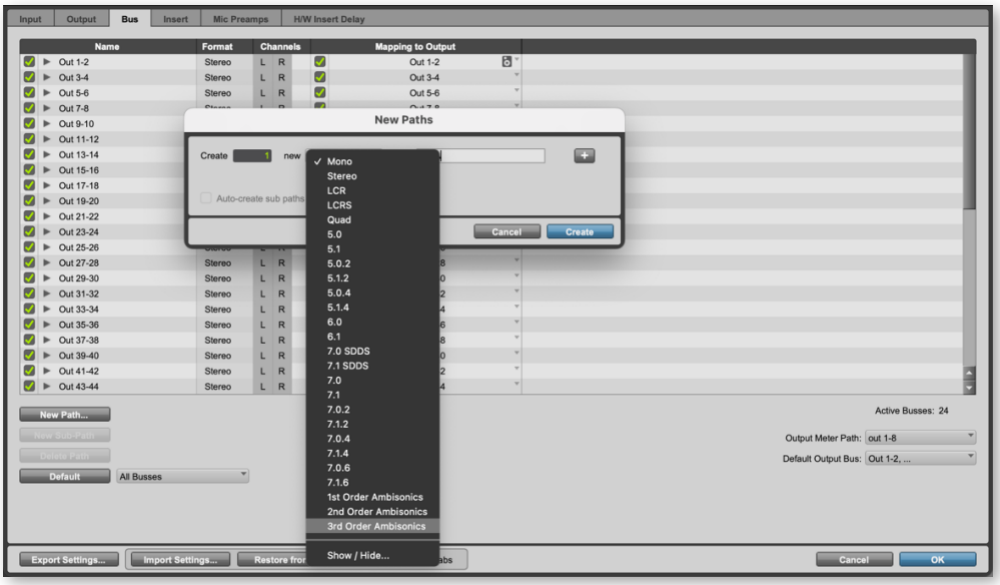
7 Ambisonics Workflow

7.1 Pro Tools

1. Create a mono/stereo track. Add dearVR PRO 2 plugin (FX category “Reverb”) with (Mono/stereo to Ambisonics 1st/2nd/3rd order) to the track.



2. Head to Setup → I/O… , add a new path and create a new Aux track (1st / 2nd / 3rd Order Ambisonics).



3. Route dearVR tracks output to the Ambisonics bus.



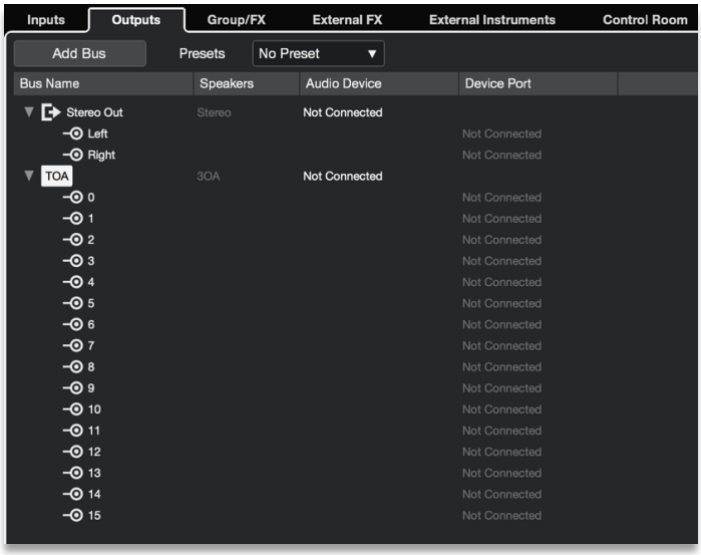
Notice
To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at www.dear-reality.com

7.2 Cubase 13 / Nuendo 13

1. Head to Studio → Audio Connections and create an Ambisonics-Bus by clicking Add Bus and choosing e.g., 3rd Order Ambisonics in Configuration.



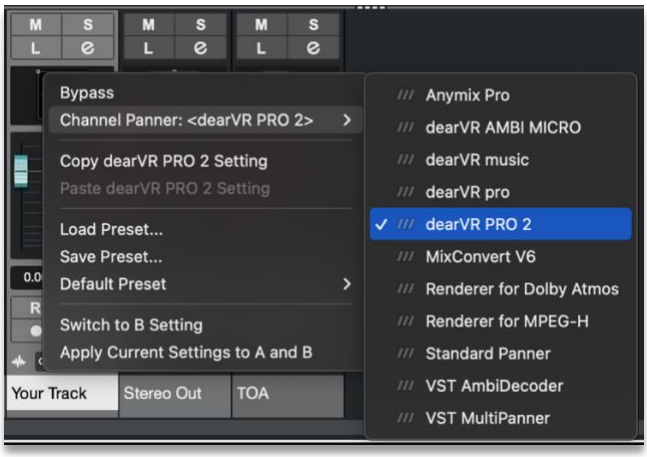
2. Right-click your new Ambisonics Bus and click specify it as the Main Mix. The Ambisonics Bus should now appear in a red color in your Audio Connections.



3. Close the Audio Connections Window and create a new track with **mono or stereo** configuration. Select your Ambisonics Bus under Output Routing.



4. Right click on the Panner field of Nuendo and select dearVR PRO 2 from the dropdown menu:

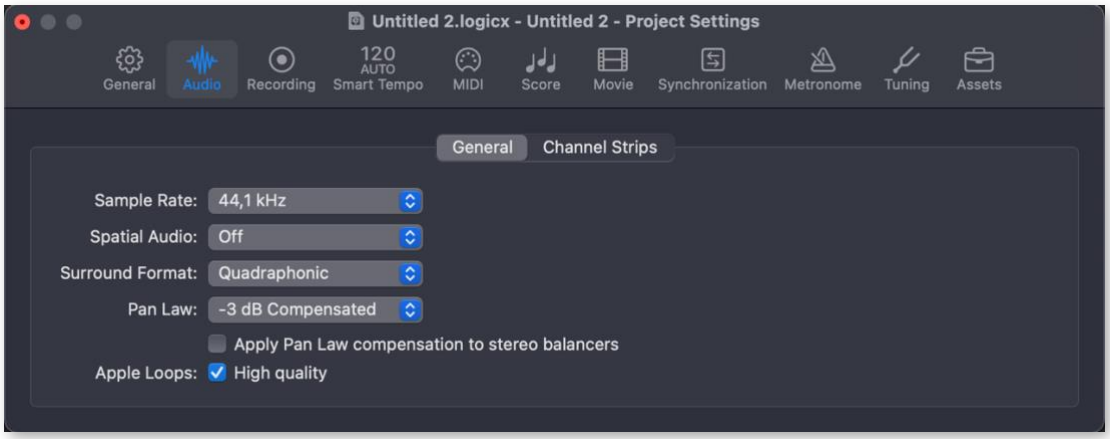


5. For every new track, just repeat steps 3 and 4 or duplicate your audio track.

Notice
To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at www.dear-reality.com If using dearVR PRO 2 with binaural output, please use the **insert effects slot** on a **stereo** track!

7.3 Logic Pro X

1. Head to File → Project Settings → Audio and choose Quadraphonic as your Surround Format



2. Create a new audio track and set the Output to Surround



3. Add the dearVR PRO 2 Audio Unit as an insert effect and choose FOA YouTube or FOA FuMa in the Output section.

4. For every new track, just repeat steps 2 – 3 or duplicate your audio track

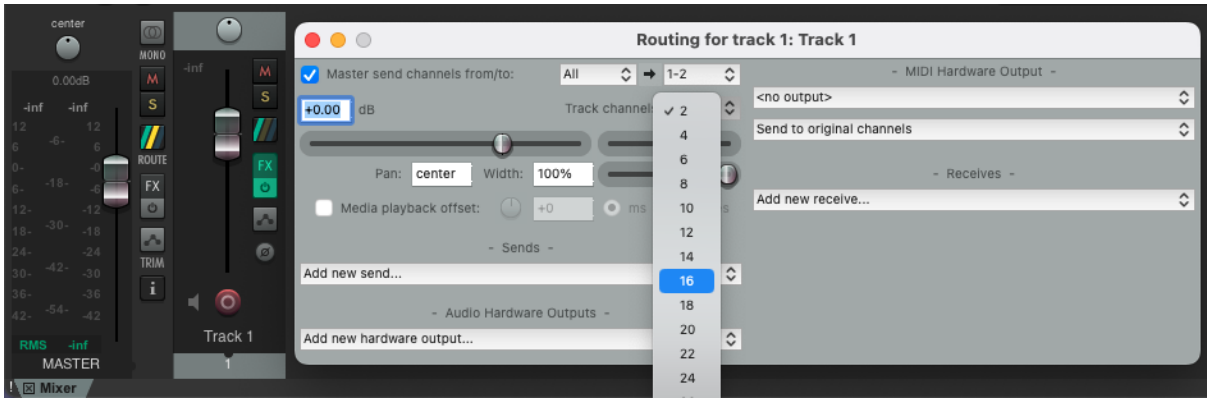
Notice
To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at www.dear-reality.com

7.4 Reaper

1. Configure your master to have as many channels as you need for your Ambisonics format by clicking on Route on the master channel.



2. Create a new track and additionally change the number of track channels to the number of the channels your Ambisonics format uses.



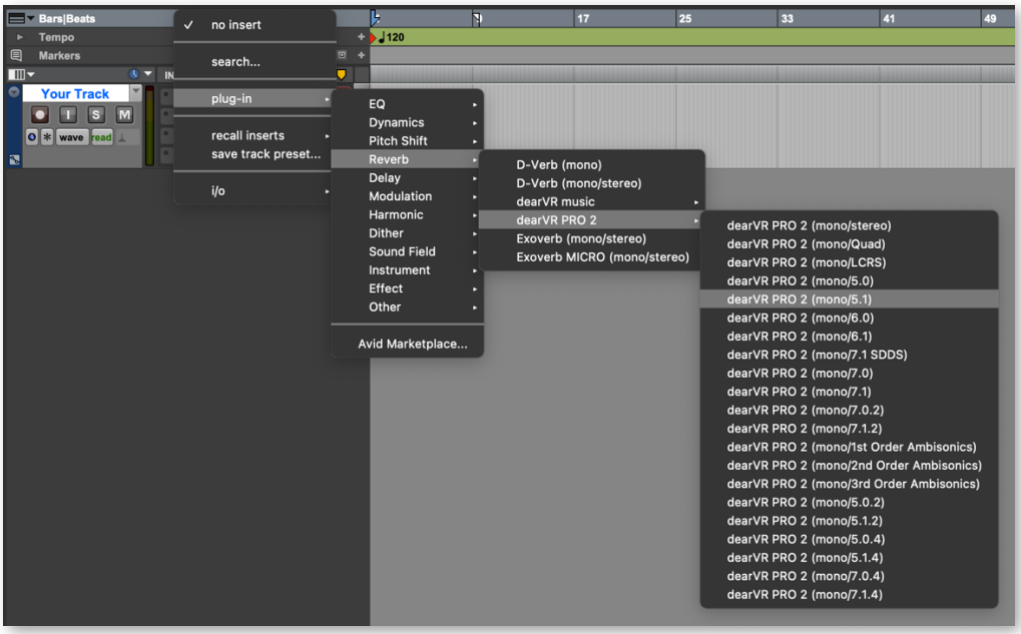
3. Put dearVR PRO 2 on the track and select your Ambisonics format in the plugin as output.
4. For every new track with an Ambisonics output repeat steps 2 and 3.

Notice
To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at www.dear-reality.com

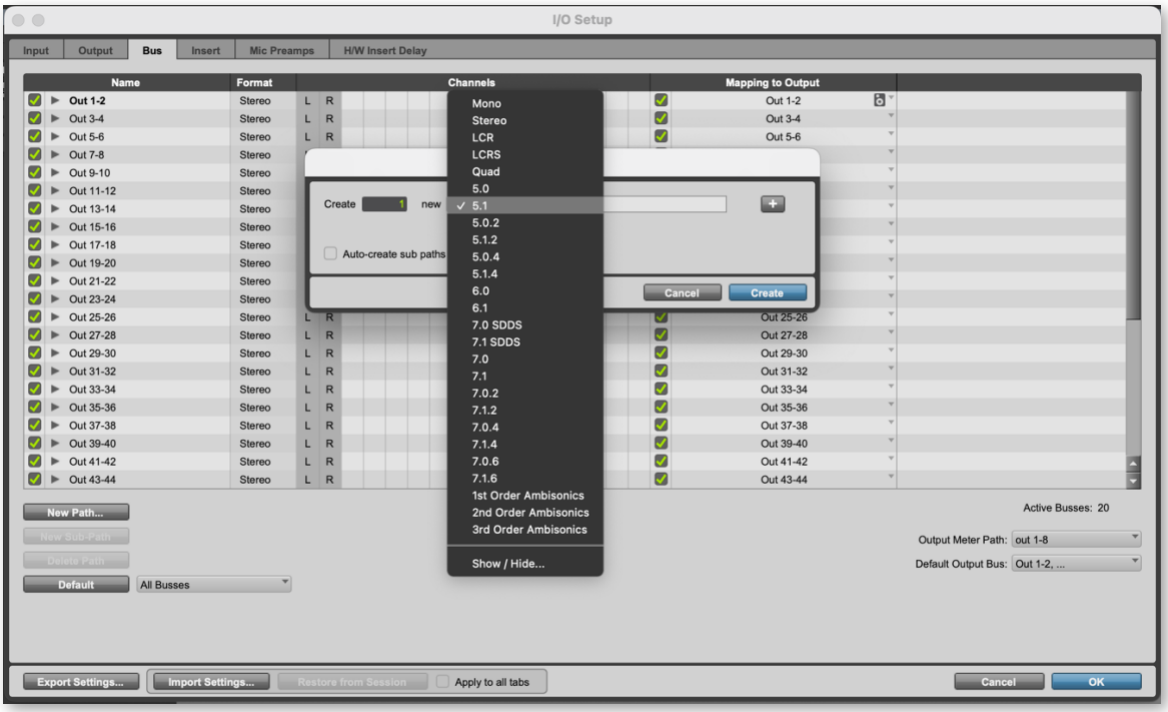
8 Multichannel Workflow

8.1 Pro Tools

1. Create a mono/stereo track. Add dearVR PRO 2 plugin (FX category “Reverb”) with mono/stereo as input format to your preferred multichannel output format to the track.



2. Head to Setup → I/O… and create a new bus or output with your preferred multichannel format.



3. Select the configured multichannel format as output format in dearVR PRO 2. Route dearVR tracks output to the multichannel bus or output.





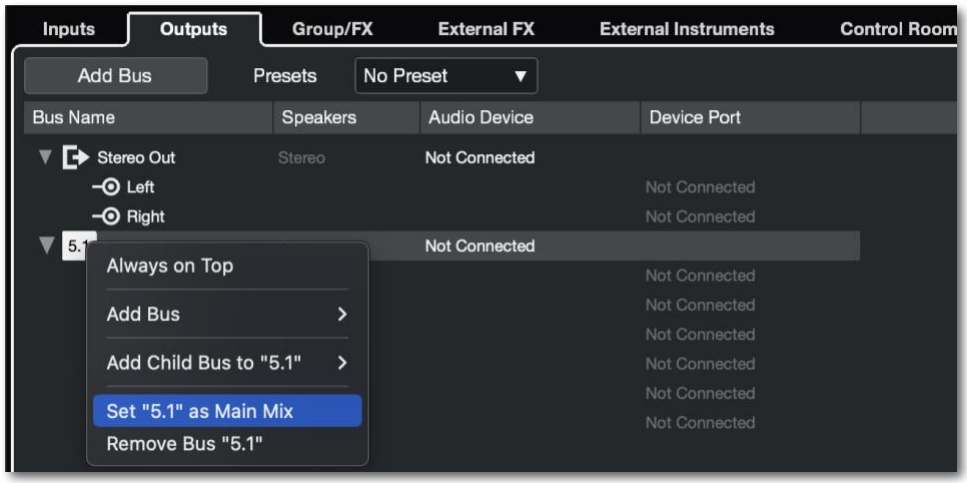
4. For every new track, just repeat steps 2 – 3 or duplicate your audio track.

8.2 Cubase 13 / Nuendo 13

1. Head to Studio → Audio Connections and create a bus with your preferred multichannel output configuration by clicking Add Bus and choosing, e.g. 5.1.



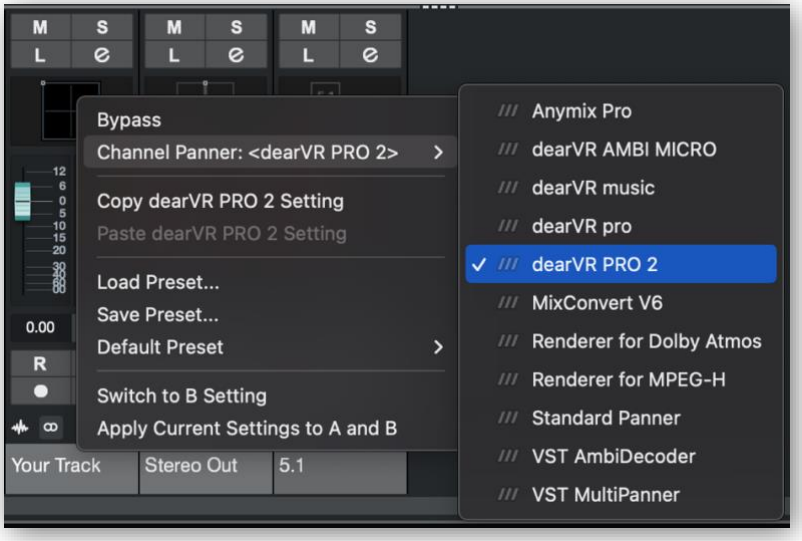
2. Right-click your new multichannel bus and specify it as the Main Mix. The multichannel bus should now appear in a red color in your Audio Connections.



3. Close the Audio Connections Window and create a new track with **mono or stereo** configuration. Select your multichannel bus under Output Routing



4. Right click on the Panner field of Nuendo and select dearVR PRO 2 from the dropdown menu. Inside the plugin choose the output format you configured in Nuendo.

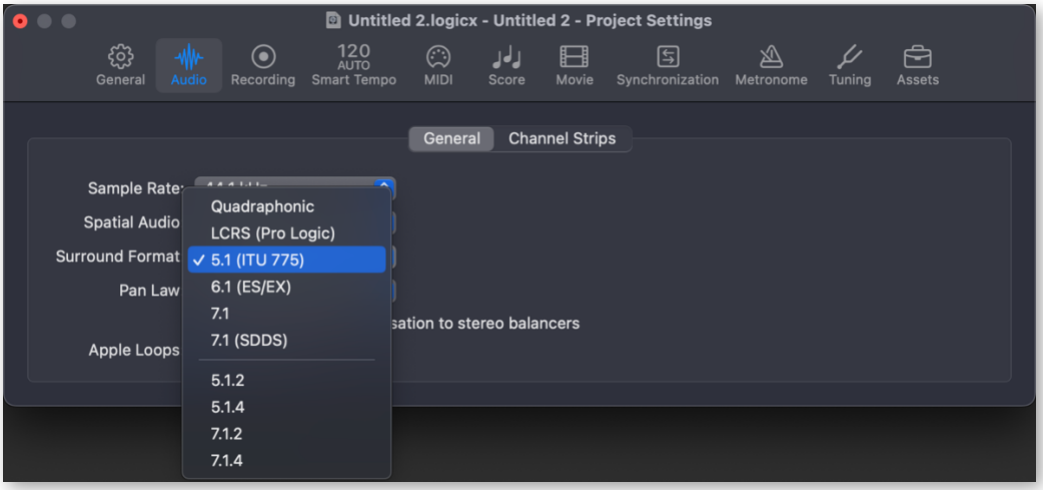




5. For every new track, just repeat steps 3 and 4 or duplicate your audio track.

8.3 Logic Pro X

1. Head to File → Project Settings → Audio and choose your preferred Surround format



2. Create a new audio track and set the Output to Surround.



3. Add the dearVR PRO 2 Audio Unit as an insert effect and choose the Surround format in the Output section.



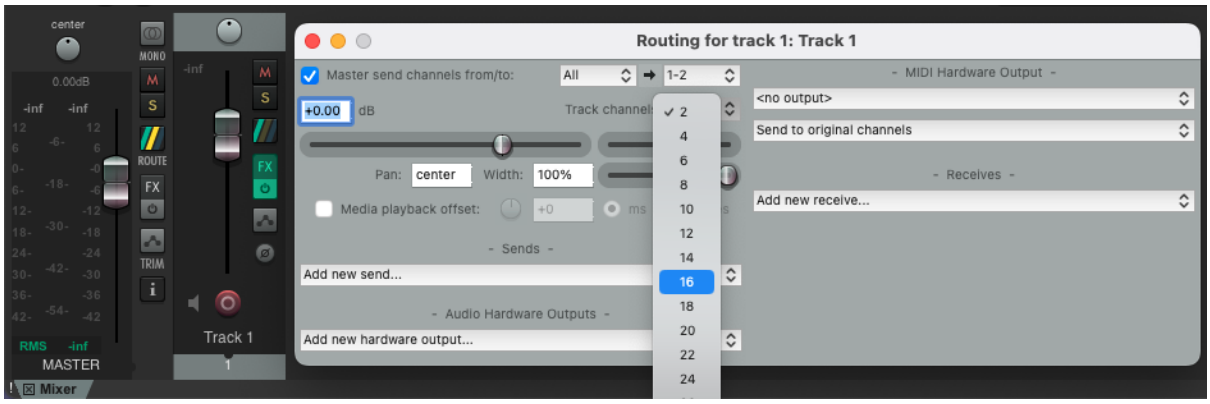
Notice
The multi-channel speaker layouts of Logic are different from that of other major DAWs (especially Pro Tools). dearVR PRO 2 automatically adapts the channel order and speaker angles for Logic Pro.

8.4 Reaper

1. Configure your master to have as many channels as you need for your multichannel format by clicking on Route on the master channel.



2. Create a new track and additionally change the number of track channels to the number of the channels your multichannel format uses.



3. Put a dearVR PRO 2 instance on the track and select your multichannel format in the plugin as output.
4. For every new track with a multichannel output repeat step 2 and 3.

9 Head Tracking

9.1 Basics

Dear Reality products use the Open Sound Control (short OSC) protocol to communicate the position of your headphones in the form of Yaw, Pitch and Roll to our plugins. The protocol needs a sender, which is your OSC-capable headtracking device, and a receiver, which is the dearVR SPATIAL CONNECT Adapter. The Adapter can be installed together with dearVR PRO 2. It then acts as a port to control all dearVR plugins. Thus, dearVR SPATIAL CONNECT Adapter has to run in the background, if you want to make use of the headtracking feature. Please make sure to open the adapter before your dearVR plugin.
You can choose between two types of protocols in the Adapter: “OSC Headtracker” or “Spatial Connect”. Use “Spatial Connect”, if you want to connect to dearVR SPATIAL CONNECT and “OSC Headtracker”, if you want to use your third party headtracker.
Follow the instructions in order to get started:

OSC Headtracker

Start dearVR SPATIAL CONNECT Adapter, set the Head Rotation Port to the port your device sends the headrotation data and choose the “OSC Headtracker” as Protocol. The logo of the SPATIAL CONNECT Adapter should state an ongoing connection, if your headtracker is sending OSC data.

Spatial Connect

Start dearVR SPATIAL CONNECT Adapter, set the Head Rotation Port to the port dearVR SPATIAL CONNECT sends the headrotation data (we recommend 7001) and choose “Spatial Connect” as Protocol. The logo of the SPATIAL CONNECT Adapter should state an ongoing

connection, if dearVR SPATIAL CONNECT is running. For more information about dearVR SPATIAL CONNECT, find the manual here.

9.2 Step by step guide for the Supperware Headtracker

We recommend the Supperware headtracker and its companion app “Bridgehead” that you can find here. But you can also use other headtrackers as long as those support OSC.

1. Download and install the Bridgehead application by Supperware, if not already installed. Use “Bridgehead for Windows (64-bit)” or “Bridgehead for macOS”.
2. Install the dearVR SPATIAL CONNECT Adapter. Just re-run the dearVR installer and choose dearVR SPATIAL CONNECT Adapter in the custom install section.

For users with an Apple Silicon computer: If your DAW runs in Rosetta mode, please make sure to also run your dearVR SPATIAL CONNECT Adapter in Rosetta mode.

Use

1. Start Bridgehead, go to “OSC bridge settings” and choose “dearVR” as Profile. Connect your Supperware headtracker via USB.
2. If the dearVR profile is not available yet, please update your bridgehead application or add the following to your Profiles.txt:

```
dearVR
/ypr
yaw,pitch,roll
local 7001
```

3. Start dearVR SPATIAL CONNECT Adapter, set the Head Rotation Port to 7001 and choose the “OSC Headtracker” as Protocol. The logo of the SPATIAL CONNECT Adapter should state an ongoing connection, if your headtracker is sending OSC data.
4. Open your DAW of choice, insert your plugin and you are all set!

5. The greyed out “HEAD ROTATION” knob should follow your head movement. If you are looking at the center of your monitor and the value of your “HEAD ROTATION” knob is not 0, please recalibrate your Supperware headtracker.

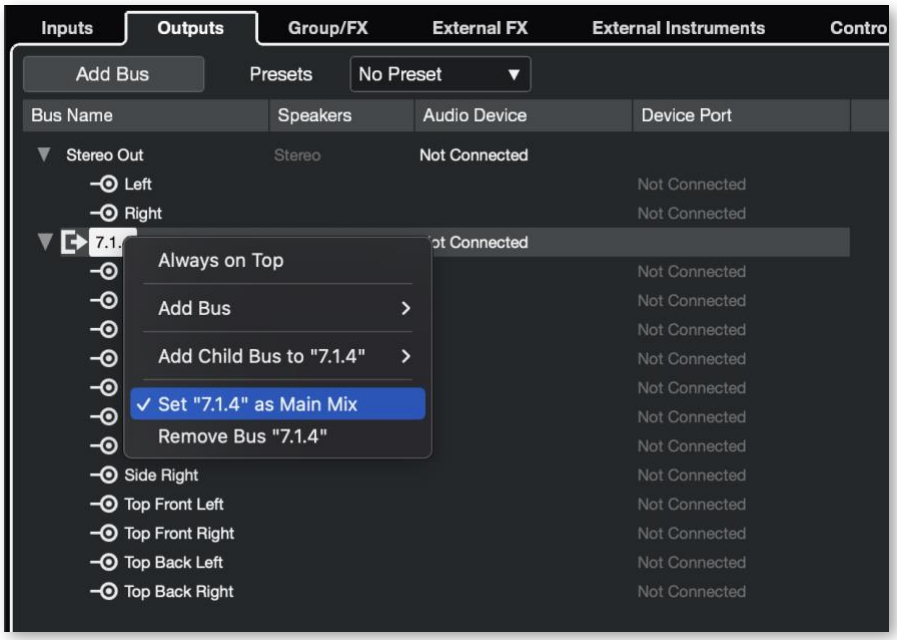
10 Atmos Workflow

10.1 Nuendo 13

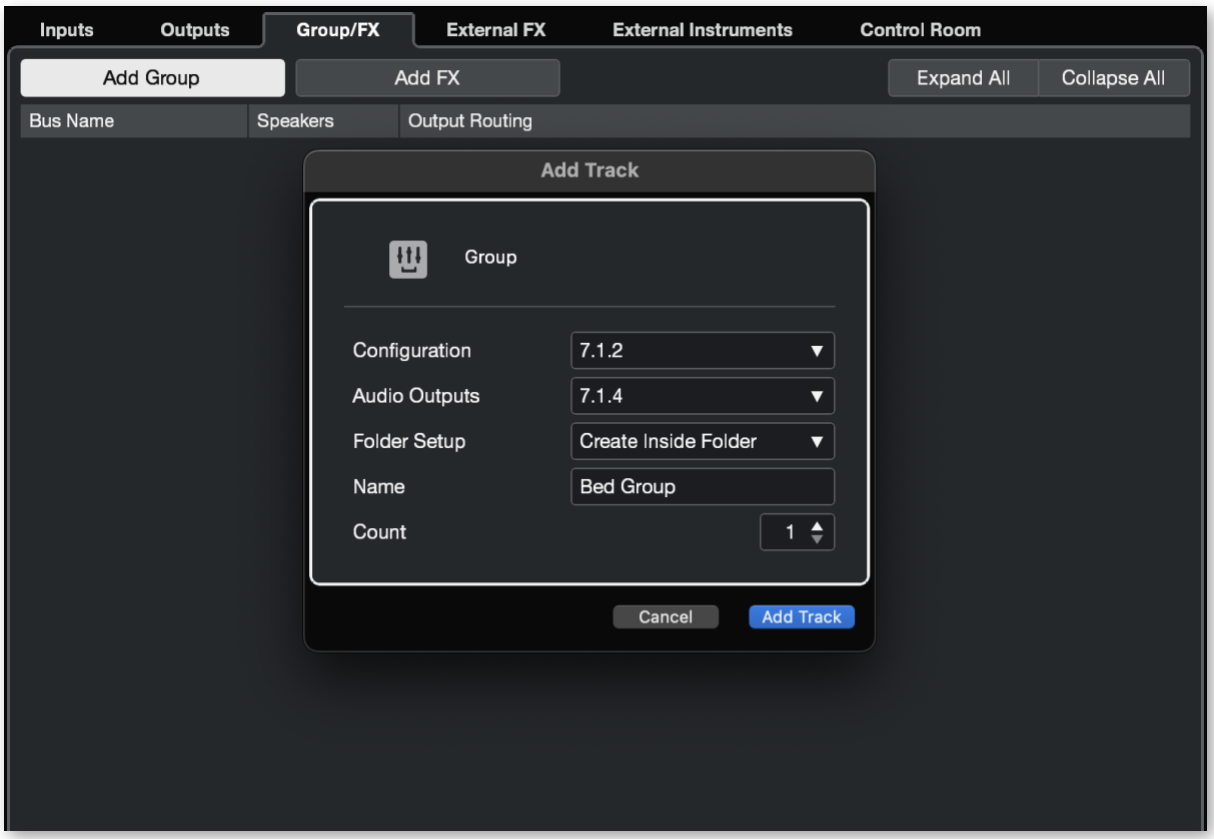
1. Head to Studio → Audio Connections and create a bus with your preferred multichannel output configuration by clicking Add Bus and choosing, e.g. 7.1.4.



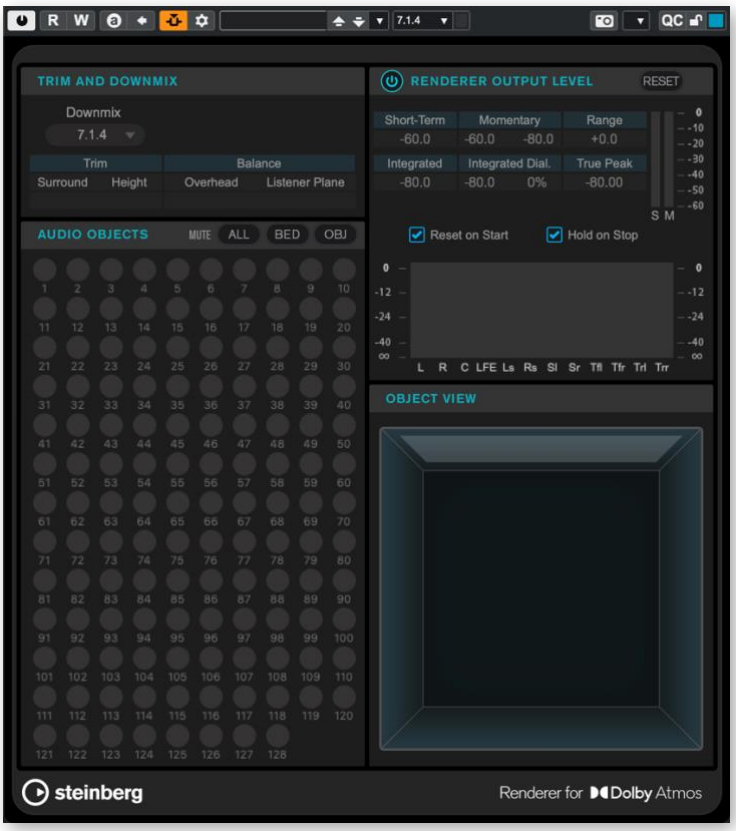
2. Right-click your new multichannel bus and specify it as the Main Mix. The multichannel bus should now appear in a red color in your Audio Connections



3. Head over to the Group/FX - Tab and create a new group for beds with your preferred output configuration, e.g. 7.1.2. Select your new output-bus from Audio Outputs.

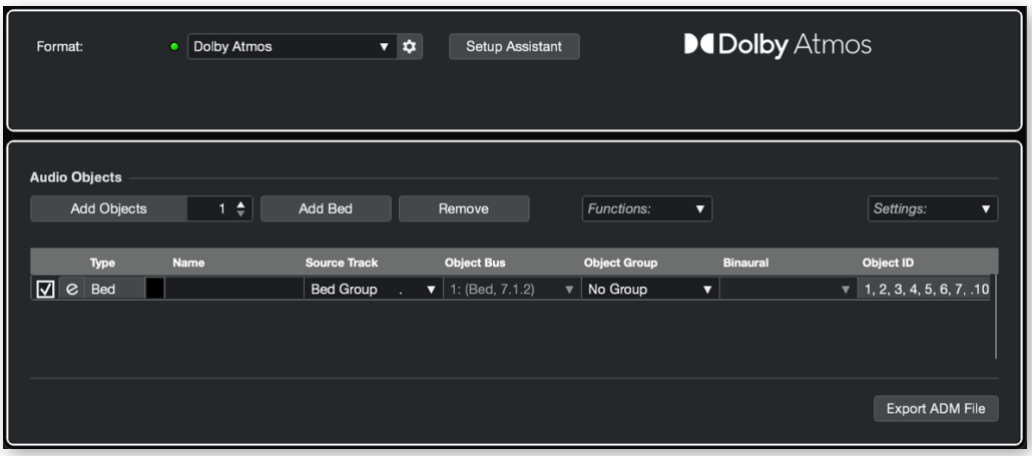


4. Close the Audio Connections window and load the Renderer for Dolby Atmos Plugin on your 7.1.4 main output bus. Set the Downmix to the format of your output bus.



Notice
You can use **dearVR MONITOR** to monitor your multichannel output bus with headphones. Please check out the plugin at www.dear-reality.com

5. Head to Project → ADM Authoring… , select Dolby Atmos as Format, click on Add Bed and select your new bed group as the source track.



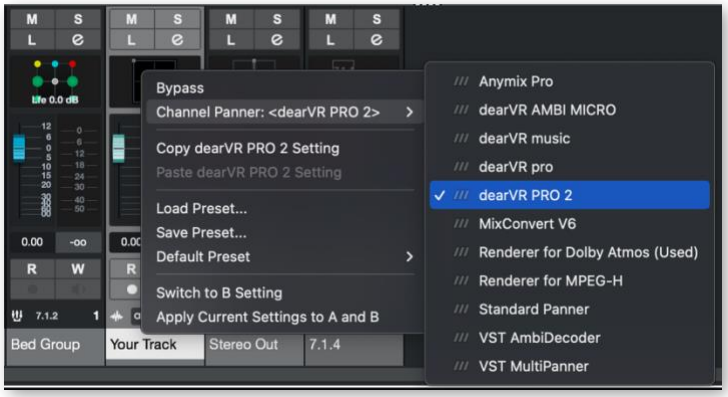
6. Create a new track with **mono or stereo** configuration. Decide whether you want to use the track as an audio object or as part of the Dolby bed:

    a. Audio Object: Select your 7.1.4 bus under Output Routing. Go back to the ADM Authoring for Dolby Atmos and add your track as an audio object. You can't use dearVR PRO 2 to spatialize audio objects in an Atmos mix. You are done with this track and can ignore the following steps.

    b. Bed: Select your bed group in Output Routing and continue with step 7.



7. Right click on the Panner field of Nuendo and select dearVR PRO 2 from the dropdown menu. Inside the plugin choose the format of your Bed Group, e.g. 7.1.2.

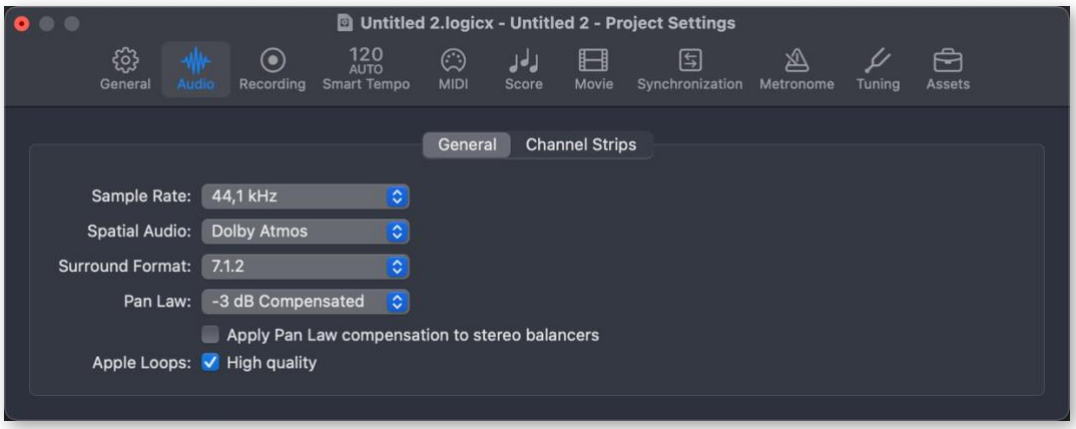




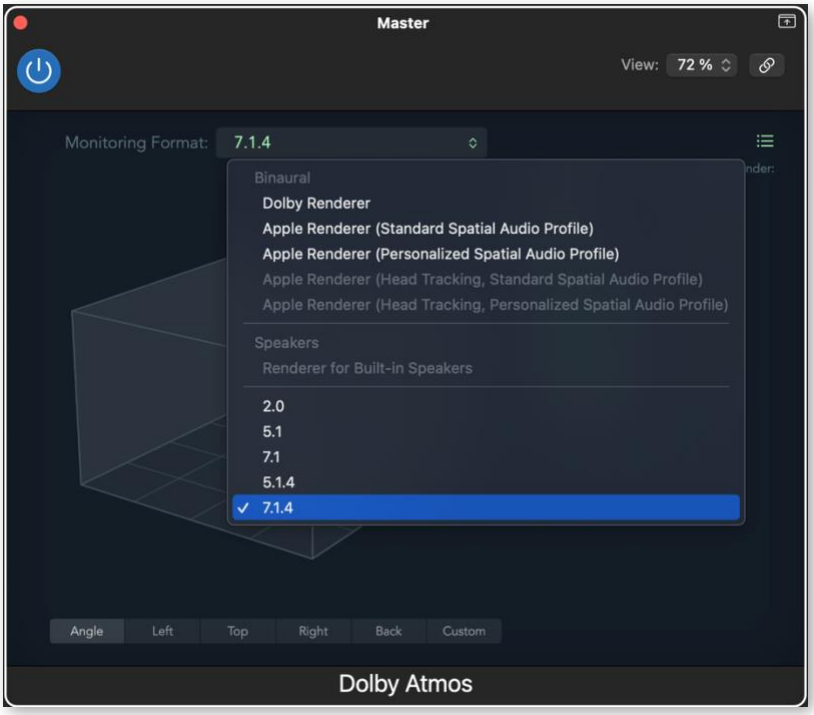
8. For every new track, just repeat steps 6 and 7 or duplicate your audio track.

10.2 Logic Pro

1. Head to File → Project Settings → Audio and set Spatial Audio to Dolby Atmos. Choose your preferred Surround Format multichannel configuration.



2. Logic automatically inserted the Atmos plugin on your master track. Open it and choose your preferred monitoring format.



Notice
You can use **dearVR MONITOR** to monitor a multichannel output with headphones. Please check out the plugin at www.dear-reality.com

3. Create a new audio track and set the Output to Surround. Decide whether you want to use your audio track as an audio object or as part of the Dolby Bed.
    a. Audio Object: Right-Click on the Panner Field and select 3D Object Panner. dearVR PRO 2 can't be used to spatialize audio objects in an Atmos mix. Your done with this track and can ignore the following steps.
    b. Bed: Add dearVR PRO 2 as an insert effect and choose the Surround format in the Output Section.



11 Preset List

Note: The larger a room the longer the reverb – and the more performance is needed!

Performance Level (**PL)** illustrates the performance load within a range from 1-10.

Level 10 needs the most performance.

A. Rooms & Halls	**Room Size** **Auralization - Wall Distance (meter)** **LEFT | FRONT | RIGHT | TOP | BACK | BOTTOM**	**PL**
Concert Hall 1	12,9m | 14,0m | 10,5m | 20,8m | 25,1m | 1,8m	5
Concert Hall 2	14,1m | 16,6m | 13,3m | 21,5m | 28,3m | 1,8m	5
Large Recording Hall	15,7m | 12,1m | 15,9m | 22,2m | 19,3m | 1,8m	7
Small Recording Hall	7,7m | 5,4m | 7,9m | 12,0m | 9,3m | 1,8m	4
Kings Hall	13,7m | 10,4m | 13,9m | 20,3m | 7,3m | 1,8m	5
Cathedral	27,5m | 24,2m | 29,0m | 30,0m | 30,0m | 1,8m	10
Church	13,9m | 17,9m | 11,5m | 25,5m | 22,1m | 1,8m	5
Chapel	14,7m | 12,4m | 14,1m | 23,0m | 16,3m | 1,8m	8
Large Room	7,9m | 4,4m | 6,9m | 10,0m | 5,5m | 1,8m	5
Medium Room	3,8m | 2,1m | 4,1m | 4,0m | 2,8m | 1,8m	4
Small Room	2,7m | 1,5m | 2,6m | 3,6m | 2,2m | 1,8m	3

B. Postproduction	Room Size Auralization - Wall Distance (meter) LEFT | FRONT | RIGHT | TOP | BACK | BOTTOM	PL
Office 1	3,2m | 1,9m | 3,9m | 4,5m | 2,8m | 1,8m	2
Office 2	6,7m | 2,4m | 6,9m | 5,3m | 3,3m | 1,8m	2
Small Studio	2,7m | 2,0m | 3,4m | 4,7m | 2,1m | 1,8m	2
Medium Conference Hall	6,7m | 3,4m | 6,9m | 7,0m | 3,3m | 1,8m	3
Cellar	2,5m | 2,8m | 3,0m | 3,2m | 2,1m | 1,8m	4
Empty Room	5,0m | 3,2m | 3,7m | 5,8m | 4,3m | 1,8m	3
Small Livingroom	2,3m | 3,1m | 2,7m | 2,9m | 2,6m | 1,8m	2
Staircase	4,7m | 3,5m | 4,9m | 8,0m | 3,3m | 1,8m	4
Corridor	2,7m | 2,0m | 2,6m | 8,8m | 4,5m | 1,8m	5
Bathroom	2,1m | 2,0m | 2,3m | 2,8m | 1,6m | 1,8m	3
Restroom	2,7m | 1,5m | 3,2m | 4,2m | 2,3m | 1,8m	4
Car 1	0,6m | 0,7m | 1,7m | 1,6m | 1,9m | 1,3m	1
Car 2	0,5m | 0,7m | 1,0m | 1,3m | 1,6m | 1,2m	1
Booth	3,7m | 2,1m | 3,3m | 2,5m | 1,3m | 1,8m	2
Cinema	8,0m | 7,0m | 9,0m | 14,0m | 9,0m | 1,3m	2
Warehouse	12,0m | 10,0m | 8,0m | 20,0m | 15,0m | 1,8m	10
Outdoor Street	24,9m | 0,0m | 22,5m | 0,0m | 0,0m | 1,8m	5
Outdoor Alley	14,2m | 0,0m | 16,5m | 0,0m | 3,1m | 1,8m	5

C. Music production	Room Size Auralization - Wall Distance (meter) LEFT | FRONT | RIGHT | TOP | BACK | BOTTOM	PL
Studio Room	6,7m | 3,4m | 6,9m | 8,0m | 3,3m | 1,8m	5
Live Stage	11,7m | 5,4m | 11,9m | 16,5m | 14,3m | 1,8m	7
Live Arena	20,2m | 17,0m | 21,5m | 25,0m | 15,7m | 1,8m	7
Heavy Ambience	6,7m | 3,1m | 6,9m | 8,0m | 3,3m | 1,8m	4
Plate Ambience	6,7m | 3,1m | 6,9m | 8,0m | 3,3m | 1,8m	3
Medium Ambience	6,7m | 3,1m | 6,9m | 8,0m | 3,3m | 1,8m	3
Small Ambience	6,7m | 3,1m | 6,9m | 8,0m | 3,3m | 1,8m	2
Vocal Hall 1	20,2m | 15,0m | 21,5m | 25,0m | 12,7m | 1,8m	7
Vocal Hall 2	20,2m | 15,0m | 21,5m | 25,0m | 12,7m | 1,8m	7
Vocal Plate	20,2m | 15,0m | 21,5m | 25,0m | 12,7m | 1,8m	8
Drum Room 1	6,7m | 3,1m | 6,9m | 8,0m | 3,3m | 1,8m	6
Drum Room 2	2,7m | 3,1m | 2,9m | 6,0m | 4,3m | 1,8m	6
Percussion Plate	6,7m | 3,4m | 6,9m | 8,0m | 4,3m | 1,8m	5
Percussion Ambience	6,7m | 3,4m | 6,9m | 8,0m | 4,3m | 1,8m	2
Acoustic Hall	20,2m | 15,0m | 21,5m | 25,0m | 12,7m | 1,8m	6
String Hall	20,2m | 15,0m | 21,5m | 25,0m | 12,7m | 1,8m	8
String Plate	20,2m | 15,0m | 21,5m | 25,0m | 12,7m | 1,8m	8

12 Multichannel Configurations

The Multichannel Layouts are different between some DAWs. Different DAWs expect the speakers to be positioned on different room angles. The angles, which are listed here refer to Pro Tools unless otherwise noted. If loaded in Logic Pro, dearVR PRO 2 automatically adapts the channel order and room angles of the DAW. On other DAWs the results may and will vary if compared due to different multichannel layouts.

Type	Description
L	Left
R	Right
C	Center
BC	Back center
LC	Left center
RC	Right center
LFE	Low frequency effects
SL	Surround left
SR	Surround right
SB	Surround back
SSL	Side surround left
SSR	Side surround right
SBL	Surround back left
SBR	Surround back right
HFL	High front left
HFR	High front right
HFC	High front center
HSL	High surround left
HSR	High surround right
T	Top
TL	Top left
TR	Top right

Stereo

Channel Number	1	2
Channel Description	L	R
Azimuth	-30°	30°
Elevation	0°	0°

LRCS

Channel Number	1	2	3	4
Channel Description	L	R	C	SB
Azimuth	-30°	30°	0°	180°
Elevation	0°	0°	0°	0°

Quad

Channel Number	1	2	3	4
Channel Description	L	R	SBL	SBR
Azimuth	-30°	30°	-135°	135°
Elevation	0°	0°	0°	0°

4.0

Channel Number	1	2	3	4
Channel Description	L	R	SL	SR
Azimuth	-30°	30°	-110°	110°
Elevation	0°	0°	0°	0°

5.0 Film

Channel Number	1	2	3	4	5
Channel Description	L	C	R	SL	SR
Azimuth	-30°	0°	30°	-110°	110°
Elevation	0°	0°	0°	0°	0°

5.0 ITU

Channel Number	1	2	3	4	5
Channel Description	L	R	C	SL	SR
Azimuth	-30°	30°	0°	-110°	110°
Elevation	0°	0°	0°	0°	0°

5.1 Film

Channel Number	1	2	3	4	5	6
Channel Description	L	C	R	SL	SR	LFE
Azimuth	-30°	0°	30°	-110°	110°	0°
Elevation	0°	0°	0°	0°	0°	-15°

5.1 ITU

Channel Number	1	2	3	4	5	6
Channel Description	L	R	C	LFE	SL	SR
Azimuth	-30°	30°	0°	0°	-110°	110°
Elevation	0°	0°	0°	-15°	0°	0°

6.0

Channel Number	1	2	3	4	5	6
Channel Description	L	R	C	SL	SR	BC
Azimuth	-30°	30°	0°	-110°	110°	180°
Elevation	0°	0°	0°	0°	0°	0°

6.1

Channel Number	1	2	3	4	5	6	7
Channel Description	L	R	C	LFE	SL	SR	BC
Azimuth	-30°	30°	0°	0°	-110°	110°	180°
Elevation	0°	0°	0°	-15°	0°	0°	0°

7.0

Channel Number	1	2	3	4	5	6	7
Channel Description	L	R	C	SSL	SSR	SBL	SBR
Azimuth	-30°	30°	0°	-90°	90°	-135°	135°
Elevation	0°	0°	0°	0°	0°	0°	0°

7.1

Channel Number	1	2	3	4	5	6	7	8
Channel Description	L	R	C	LFE	SSL	SSR	SBL	SBR
Azimuth	-30°	30°	0°	0°	-90°	90°	-135°	135°
Elevation	0°	0°	0°	-15°	0°	0°	0°	0°

7.1 SDDS

Channel Number	1	2	3	4	5	6	7	8
Channel Description	L	R	C	LFE	SL	SR	LC	RC
Azimuth	-40°	40°	0°	0°	-110°	110°	-20°	20°
Elevation	0°	0°	0°	-15°	0°	0°	0°	0°

5.0.2

Channel Number	1	2	3	4	5	6	7
Channel Description	L	R	C	SL	SR	HFL	HFR
Azimuth	-30°	30°	0°	-110°	110°	-30°	30°
Elevation	0°	0°	0°	0°	0°	30°	30°

5.0.4 (Nuendo only)

Channel Number	1	2	3	4	5	6	7	8	9
Channel Description	L	R	C	SL	SR	HFL	HFR	HSL	HSR
Azimuth	-30°	30°	0°	-110°	110°	-30°	30°	-110°	110°
Elevation	0°	0°	0°	0°	0°	30°	30°	30°	30°

5.1.2

Channel Number	1	2	3	4	5	6	7	8
Channel Description	L	R	C	LFE	SL	SR	TL	TR
Azimuth	-30°	30°	0°	0°	-110°	110°	-80°	80°
Elevation	0°	0°	0°	-15°	0°	0°	45°	45°

5.1.4 (Nuendo only)

Channel Number	1	2	3	4	5	6	7	8	9	10
Channel Description	L	R	C	LFE	SL	SR	HFL	HFR	HSL	HSR
Azimuth	-30°	30°	0°	0°	-110°	110°	-45°	45°	-135°	135°
Elevation	0°	0°	0°	-15°	0°	0°	45°	45°	45°	45°

7.0.2

Channel Number	1	2	3	4	5	6	7	8	9
Channel Description	L	R	C	SSL	SSR	SBL	SBR	TL	TR
Azimuth	-30°	30°	0°	-90°	90°	-135°	135°	-80°	80°
Elevation	0°	0°	0°	0°	0°	0°	0°	45°	45°

7.0.4

Channel Number	1	2	3	4	5	6	7	8	9	10	11
Channel Description	L	R	C	SSL	SSR	SBL	SBR	HFL	HFR	HSL	HSR
Azimuth	-30°	30°	0°	-90°	90°	-135°	135°	-30°	30°	-135°	135°
Elevation	0°	0°	0°	0°	0°	0°	0°	30°	30°	30°	30°

7.1.2

Channel Number	1	2	3	4	5	6	7	8	9	10
Channel Description	L	R	C	LFE	SSL	SSR	SBL	SBR	TL	TR
Azimuth	-30°	30°	0°	0°	-90°	90°	-135°	135°	-80°	80°
Elevation	0°	0°	0°	-15°	0°	0°	0°	0°	45°	45°

7.1.4 (Nuendo only)

Channel Number	1	2	3	4	5	6
Channel Description	L	R	C	LFE	SBL	SBR
Azimuth	-30°	30°	0°	-	-135°	135°
Elevation	0°	0°	0°		0°	0°

Channel Number	7	8	9	10	11	12
Channel Description	SSL	SSR	HFL	HFR	HSL	HSR
Azimuth	-90°	90°	-45°	45°	-135°	135°
Elevation	0°	0°	45°	45°	45°	45°

9.1.2 (Nuendo only)

Channel Number	1	2	3	4	5	6
Channel Description	L	R	C	LFE	SL	SR
Azimuth	-30°	30°	0°	-	-90°	90°
Elevation	0°	0°	0°		0°	0°

Channel Number	7	8	9	10	11	12
Channel Description	SBL	SBR	SSL	SSR	TL	TR
Azimuth	-135°	135°	-60°	60°	-80°	80°
Elevation	0°	0°	0°	0°	45°	45°

9.1.6 (Nuendo only)

Channel Number	1	2	3	4	5	6	7	8
Channel Description	L	R	C	LFE	SBL	SBR	SL	SR
Azimuth	-30°	30°	0°	0°	-135°	135°	-90°	90°
Elevation	0°	0°	0°	-15°	0°	0°	0°	0°

Channel Number	9	10	11	12	13	14	15	16
Channel Description	SSL	SSR	HFL	HFR	HSL	HSR	TL	TR
Azimuth	-60°	60°	-45°	45°	-135°	135°	-90°	90°
Elevation	0°	0°	45°	45°	45°	45°	45°	45°

8.0

Channel Number	1	2	3	4	5	6	7	8
Channel Description	L	R	SL	SR	HFL	HFR	HSL	HSR
Azimuth	-30°	30°	-110°	110°	-30°	30°	-110°	110°
Elevation	0°	0°	0°	0°	30°	30°	30°	30°

9.1

Channel Number	1	2	3	4	5	6	7	8	9	10
Channel Description	L	R	C	LFE	SL	SR	HFL	HFR	HSL	HSR
Azimuth	-30°	30°	0°	0°	-110°	110°	-30°	30°	-110°	110°
Elevation	0°	0°	0°	-15°	0°	0°	30°	30°	30°	30°

10.0

Channel Number	1	2	3	4	5	6	7	8	9	10
Channel Description	L	R	C	SL	SR	T	HFL	HFR	HSL	HSR
Azimuth	-30°	30°	0°	-110°	110°	0°	-30°	30°	-110°	110°
Elevation	0°	0°	0°	0°	0°	90°	30°	30°	30°	30°

11.1 (Nuendo only)

Channel Number	1	2	3	4	5	6
Channel Description	L	R	C	LFE	SL	SR
Azimuth	-30°	30°	0°	-	-110°	110°
Elevation	0°	0°	0°		0°	0°

Channel Number	7	8	9	10	11	12
Channel Description	T	HFL	HFC	HFR	HSL	HSR
Azimuth	0°	-30°	0°	30°	-110°	110°
Elevation	90°	30°	30°	30°	30°	30°

13.1 (Nuendo only)

Channel Number	1	2	3	4	5	6	7
Channel Description	L	R	C	LFE	SBL	SBR	SL
Azimuth	-30°	30°	0°	-	-150°	150°	-110°
Elevation	0°	0°	0°		0°	0°	0°

Channel Number	8	9	10	11	12	13	14
Channel Description	SR	T	HFL	HFC	HFR	HSL	HSR
Azimuth	110°	0°	-30°	0°	30°	-110°	110°
Elevation	0°	90°	30°	30°	30°	30°	30°

13 Troubleshooting / Known issues

1. Minimum Buffer Size.

A minimum buffer size of 1024 is recommended.

2. Multichannel output for Ableton Live, FL Studio, Samplitude, Cakewalk, and other stereo-only DAWs

Due to restrictions within these hosts, no multichannel or Ambisonics outputs are available.

3. Cubase/Nuendo behaviour for mono audio tracks

Due to the internal routing of the Cubase/Nuendo mono track, the spatialization processing of dearVR PRO 2 is restricted.

This issue arises when a mono -> stereo track is setup in Cubase/Nuendo and dearVR PRO 2 is placed on an insert effects slot. To avoid this issue please always use dearVR PRO 2 with a stereo track in Nuendo/Cubase, even if you're working with mono material.

4. Legacy Incompatibility with Cubase/Nuendo panner slots

Since the introduction of the Nuendo and Cubase Pro panner slots, dearVR PRO 2 no longer operates in the insert effects chain, when it's being used to output Ambisonics.

A Nuendo/Cubase session with dearVR PRO 2 placed in the insert effects slot is therefore not compatible with the new panner slot setup (except for binaural and 2.0 Stereo setup).

6. Pro Tools user presets:

If there are no user presets available, delete the dearVR PRO 2 folders in Pro Tools' plugin settings. Reinstall the AAX component afterwards.

WIN: C:\Users\<user>\Documents\Pro Tools\Plug-In Settings

macOS: ~/Documents/Pro Tools/Plug-In Settings

7. dearVR PRO 2 does not appear in my DAW on Windows:

dearVR PRO 2 does not appear in DAWs, when a Visual C++ Redistributable is missing. Try to install the “Microsoft Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019 Redistributabel (x64)” on your machine. You can find the package here: https://support.microsoft.com/en-ca/help/2977003/the-latest-supported-visual-c-downloads

8. dearVR PRO 2 in Adobe Premiere

dearVR PRO can cause crashes in Adobe Premiere 2022. We recommend using the VST3 version of the plugin, as it works best with Premiere. Due to an incompatibility issue there might occur crashes, when trying to close the application. Make sure to save all changes, before closing Adobe Premiere.

14 Contact

Support

Please let us know if there are any questions concerning the dearVR Plugin.
If you need further assistance, please send an email to:
support@dear-reality.com

For the latest news concerning dearVR please visit our website at:
www.dear-reality.com

DEARREALITY

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Caution

Using headphones requires responsible listening. Damage to hearing occurs when listen to loud sounds with headphones over time.

- Set the volume control of your computer to a minimum when connecting your headphones.
- Set the volume in a quiet environment and select the lowest volume at which you can hear adequately.
- Do not turn the volume control to high, as this can cause permanent hearing damage.
- Be aware that you can adapt to higher volume settings over time, not realizing that the higher volume may be harmful to your hearing.

Dear Reality GmbH will in any event not be liable for any damage to hearing caused by loud sounds.

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