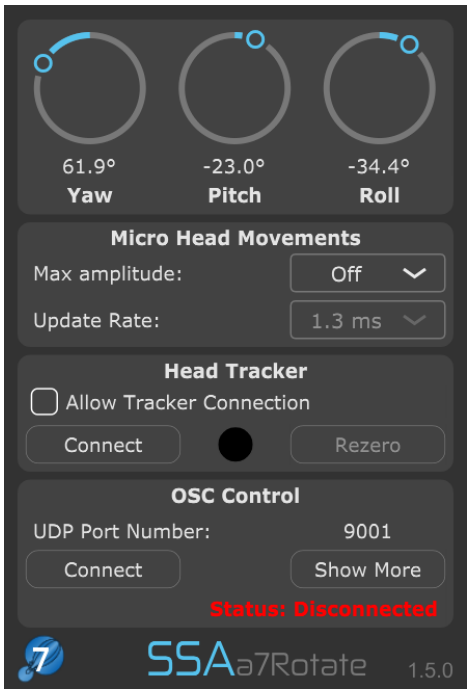
aXRotate

a1Rotate/a3Rotate/a7Rotate

Ambisonics Rotation & Head Tracking plugin

v. 1.5.0

User Manual



Peter Stitt – peter@ssa-plugins.com
https://www.ssa-plugins.com

Requirements

To use the **aXRotate** you must have a program or DAW capable of handling plugins with the required number of audio channels without applying any additional processing.

In order to benefit from head tracking you must have the EDTracker (wired or wireless) head tracker unit.

Installation

1. Download the .zip file from your account on https://www.ssa-plugins.com
2. Unzip the folder and run the installer to place the contents in the default VST3/AU/AAX folder on your computer.
3. Open your DAW and rescan for new plugins
4. Add the plugin to a new track that can handle multichannel audio. For example, in Pro Tools | Ultimate this will require you to create an Ambisonic track/buss.
5. If required, make sure your computer is connected to the internet, enter the serial number emailed to you to activate the plugin.

To uninstall simply delete the plugin files from your computer. On Windows you can uninstall from Add/Remove Programs.

Summary

The **aXRotate** plugins allow the Ambisonics sound field to be rotated. This can be applied to single sound sources but is most useful when used as a bus effect to efficiently rotate a sound scene consisting of multiple sources at once.

The **aXRotate** plugins can also be connected to the EDTracker (wired and wireless). It also theoretically works with any tracker that sends orientation data as joy-stick data, though has only been tested with the **EDTracker** to date. The **EDTracker** is relatively cheap and is even cheaper if you want to try the DIY route! Future updates will include support for other head trackers.

The **aXRotate** plugins also allow for the option to add micro-movements to sound field. This is useful when head tracking is not available and the final output of your project is intended to be a static binaural rendering.

- **Input** – AmbiX (SN3D/ACN) format Ambisonics.
- **Output** – AmbiX (SN3D/ACN) format Ambisonics.
- **Formats**: AAX, VST3, AU

Top Tip:
The best place to put the **aXRotate** is just before your binaural decoder (such as the **aXMonitor**). This way your whole sound scene reacts to your head movements or has micromovements added.

Usage Notes

Automatic Order Detection - The **aXRotate** automatically selects order to match that of the input signal by estimating the signal order. This helps to keep the CPU use as low as possible while allowing the encoding order to be changed earlier in the signal chain without having to change parameters on the **aXRotate**.

ABOUT TRACKER LATENCY...

TO AVOID PERCEPTUAL ARTEFACTS WITH HEAD-TRACKING ACTIVE THE LATENCY NEEDS TO BE AS LOW AS POSSIBLE. THIS IS A FUNCTION OF YOUR TRACKER AND YOUR **AUDIO INTERFACE BUFFER SIZE**. SET THIS TO AS LOW A VALUE AS POSSIBLE WITHOUT CAUSING DROUPOUTS IN YOUR AUDIO!

BE AWARE THAT **CONVOLUTIONS**, SUCH AS **AMBISONICS-TO-BINAURAL** DECODERS ALSO ADD TO TRACKER LATENCY IF PLACED AFTER THE PLUGIN.

AIM FOR A **TOTAL** LATENCY OF LESS THAN 50 MILLISECONDS. THE SHORTER, THE BETTER.

Ambisonics Rotation Controls

The **aXRotate** plugins allow you to rotate an Ambisonics sound field around three difference axes.

- Yaw – rotation around the z-axis (pointing directly up), as if turning your head left-right. A positive angle rotates the sound field in an anti-clockwise direction.
- Pitch – rotation around the y-axis (pointing directly left), as if tilting your head up-down.
- Roll – rotation around the x-axis (pointing directly forward), as if rolling your head side to side.

The rotations take place sequentially in the order yaw-pitch-roll. The manual rotation controls are deactivated when head tracking is active.

Head Tracker Controls

If your EDTracker is already connected to your computer when you add a new instance of **aXRotate** to your project, it should connect automatically. If it does not, or you connect the EDTracker after adding the plugin, you can simply click on the **Connect** button. Once connected the "light" beside the button should illuminate.

The **Rezero** button resets the front-facing position to the orientation of the tracker when the button is pressed. This does not reset anything on the tracker itself, only inside the plugin.

Micro Head Movements

Micro Head Movements can be activated from the drop-down menu in the bottom half of the plugin interface. The maximum size of the oscillations can be varied from 1 degree to 10 degrees. The oscillation amplitude you pick will depend on your audio content. The aim is to have as small variations that are not audible or distracting.

The benefit can be increased spatial perception for the listener if they are listening to a binaural rendering without head tracking. This is because when we are listening, we never have our heads completely still. Adding micro oscillations helps to simulate this when statically rendering. It is no substitute for true head tracking, but it is a good option to have when tracking is not possible.

The **Micro Head Movements** are disabled automatically when head-tracking is active because in this case the micro-movements are in the tracker movement data!

Update Rate

The **Update Rate** controls how often the head-tracker or micro head movements are updated. This value must always be smaller than your audio interface buffer size. Smaller update values will lead to smoother head-tracker/movement data but will require more CPU.

Note that the **Update Rate** only controls how often the data is sampled, it does not change the overall latency! Reducing your audio interface buffer size will do that.

The **Update Rate** is only activated when head tracking or micro head movements are active.

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