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# **O7A Head Tracker Plugin**

## **v2.4.0**

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# 1 Introduction

The O7A Head Tracker Plugin modifies a seventh order ambisonic (O7A) audio stream to take into account head movements. This can be useful when monitoring mixes made with [Blue Ripple Sound's O7A plugins](#) on headphones.

**This plugin is experimental and unsupported. It is currently available for Windows only.**

Head tracking data is also used in Blue Ripple Sound's "O7A View" plugins, but that is acquired in a different way, for instance from a Virtual Reality system.

In this case, head tracking data is received as Windows joystick data, for instance from the [DIY](#) or [Pro](#) versions of EDTracker.

In general we recommend the use of O7A streams primary for research purposes, or in studios with high-end modern hardware. **The CPU load generated by the O7A plugins can be very high and may not be suitable for use on standard studio computer systems.** Third order (O3A) streams are an alternative. These carry enough spatial detail for most practical applications and present a much lighter processing load. Many O3A plugins run roughly four or sixteen times faster than their O7A equivalents.

## 1.1 Audio Compatibility

O7A streams require audio busses with at least 64 channels, which (at the time of writing) most Digital Audio Workstations (DAWs) cannot handle. Some are limited at 2 channel stereo and many are limited at the 8 channels used for 7.1 surround mixes. **The O7A plugins will not work correctly with these DAWs**, which may even crash. In general, Reaper or Pro Tools Ultimate (version 2023.6 or later) are good options.

### 1.1.1 AAX

This plugin is compatible with [Pro Tools Ultimate](#) version 2023.6 or later. Pro Tools keeps careful track of exactly what stem formats are present on tracks and busses; this is a powerful feature which helps avoid mistakes and helps ensure plugins are used in the right places.

### 1.1.2 VST2

Most VST2-compatible DAWs (such as [Reaper](#)) have a plugin "path", which is a list of directories which will be searched for VST2 plugins. You may need to change this path to point at the location of the plugins, or move the plugins there. By default, these plugins are installed into `/Library/Audio/Plug-Ins/VST` on macOS. Various directories may be used on Windows, but `C:\Program Files\Steinberg\VST2` is not uncommon.

## 1.2 "Joystick" Compatibility

Head tracking data is received over the standard joystick channels as X, Y, Z data, for instance from the [DIY](#) or [Pro](#) versions of EDTracker. This data is interpreted as 360 degree yaw, pitch and roll.

## 1.3 Technical Requirements

### 1.3.1 Operating System

Supported versions of Microsoft Windows are 10 or 11, 64bit Intel.

Supported versions of Apple macOS are 10.14 to 13.5, 64bit Intel or Apple Silicon.

### 1.3.2 VST Host

The VST plugins require a VST 2 host with shell plugin support.

**These plugins do not work with all VST 2 hosts.** One reason for this is that the O7A plugins need large numbers of channels on their input or output busses. Check the individual plugins for the channel counts they need, but all of the O7A plugins need at least 64 channels on each track. Also, at the time of writing VST 2 shell plugins are not supported in Nuendo or Cubase.

### 1.3.3 AAX Host

The AAX plugins require **Pro Tools Ultimate version 2023.6** or later.

Due to channel and stem restrictions, not all plugins are supported in AAX. Please see the plugin descriptions for details.

### 1.3.4 PC Hardware

Please check your PC meets the following requirements:

- Intel Core i7 CPU or better, or Apple Silicon.
- 400MB of free disk space.

### 1.3.5 Permissions

You'll need administrator permissions while installing on Windows. The software probably won't install properly using a "restricted" account.

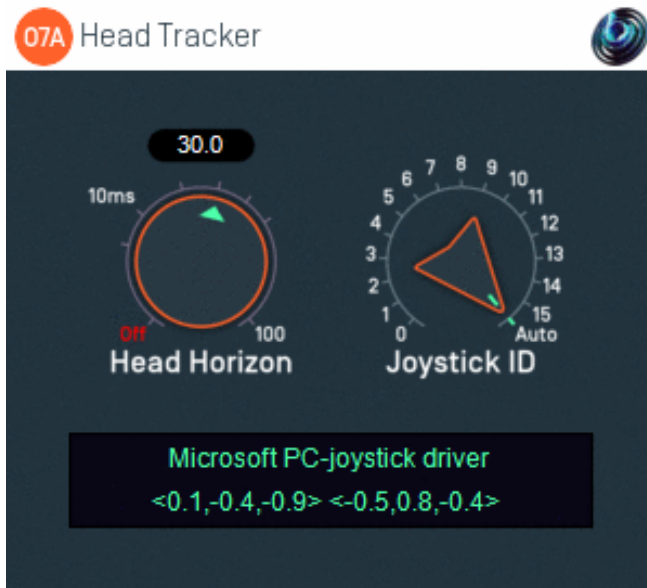
### 1.3.6 Internet Connection Required

This software requires an Internet Connection for license activation and verification.

Successful license verification isn't required every time you use the software, but it is needed during installation and needs to succeed once every couple of weeks to keep the license fresh.

The license can be "revoked" to remove it from one machine so it can be moved on to another. You should also do this if you're updating your system in case the machine appears to have changed identity.

# 2 O7A Head Tracker



## 2.1 Host Support

Host Type	Support
AAX	Yes
VST2	Yes

## 2.2 Audio

	Channels	Content
Input	64	O7A
Output	64	O7A

## 2.3 Controls

- [Head Horizon](#)
- [Joystick ID](#)

## 2.4 Description

This plugin takes data from a head tracker and rotates an O7A audio stream to compensate for it. For instance, if the head is turned to the left, the audio scene is rotated to the right so sounds that were to the left are now heard in front.

When listening on headphones with synthetic binaural, this can be used to keep an O7A audio scene fairly static in space when the head is turned.

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The results of the head tracked rotation will not be heard until after the audio has passed through your DAW and system audio stack. Consequently, it can be latent. To attempt to compensate for this, a [Head Horizon](#) forward predictor is available. This attempts to guess where the head *will* be, based on the data available. However, best results are typically achieved when latency is very low (a few milliseconds) so it may be worth configuring your DAW with this in mind.

Information about the joystick driver in use is shown in the display box, along with the current 'forward' and 'up' head direction vectors, in ambisonic coordinates (so X is forwards, Y is to the left and Z is up).

## 2.5 Setting Up

This plugin currently only supports head trackers that present head yaw, pitch and roll as Windows X, Y, Z Joystick data. Either the [DIY](#) or [Pro](#) versions of EDTracker can be used.

If using EDTracker, please ensure that you set your scaling (both Yaw and Pitch) to 1. This is necessary because EDTracker is often used in gaming where head movements are exaggerated when converted to game joystick movements. This is not appropriate here. Also, please ensure you calibrate and reset head orientation before use.

Once everything is working, the effect should be obvious in the Blue Ripple Sound O7A Visualiser plugin when the head tracking device is rotated. Please note that movements on the visualiser will be in the opposite direction to movements of the device.

## 2.6 Controls

### 2.6.1 Control: Head Horizon

This dial determines how far into the future the head tracking module will attempt to predict head orientation. Longer predictions are less stable. This module can be turned off. It can be used to help compensate for slow head tracking or latent audio.

### 2.6.2 Control: Joystick ID

This dial can be used to select which joystick should be used, when more than one is present. When set to "Auto", the first available joystick is used.