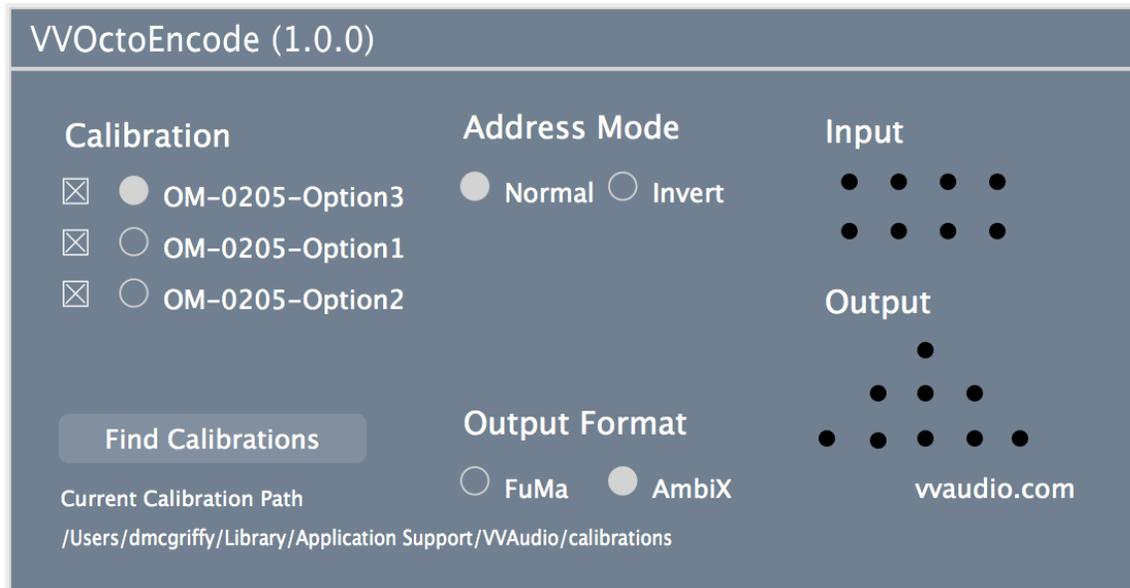# Getting Started with VVOctoEncode

This document will help you get started using the VVOctoEncode plugin from VVAudio. VVOctoEncode takes signals from a tetrahedral microphone (called A-format) and converts them into B-format using the calibration files supplied by the manufacturer. Built for the Core Sound OctoMic, VVOctoEncode can be used with any microphone having eight capsules and producing second order ambisonics.

To get the most out of this document, you should have some basic familiarity with the process of recording using computers. You need not be an expert in either digital recording or ambisonics.

We will cover the installation, setup and use of VVOctoEncode. With this, you should be able to use VVOctoEncode to convert your microphone signals into B-format. A complete ambisonic workflow will also include at least a decoder and perhaps some processing. We will see how VVOctoEncode fits into this larger picture.

Table of Contents

Getting Started with VVOctoEncode – Copyright © 2023 VVAudio

Installation

Before installing VVOctoEncode, you should have downloaded the appropriate plugin package for your operating system and the calibration files for your microphone. After that it all depends on which platform you are using.

MacOS

The MacOS versions of VVOctoEncode are distributed as a .pkg file that will install both VST and AAX to the correct locations. Note that you will need to right-click on the .pkg file and select "open" instead of simply double clicking on it in order to satisfy Apples security policies.

Windows

In Windows, VST's can go anywhere and most VST hosts have some way of choosing the VST directory. The default location for 64-bit plugins, as defined by Steinberg is "`C:\Program Files\Common Files\VST2`".

The Windows version of VVOctoEncode is distributed as an installer package. This installer puts the AAX plugins in their proper location and allows the user to choose the location for the VSTs.
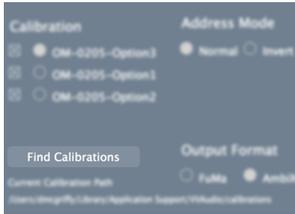
Calibration files

VVOctoEncode relies on calibration files to properly encode each microphone. Ideally, these should be specific to your particular mic, based on measurements of of its individual responses. Every Core Sound ambisonic mic comes with such calibration files. For other types, you can have your microphone measured and individual calibration files produced. If this is not possible, calibration files from another microphone of the same type can be used, though the results will not be as accurate.

Calibration files can be loaded from two formats. OctoMics come with .octo files, each of which has several related .wav files. There will normally be three such .octo files, which when loaded appear as Option 1, 2 & 3. These three options allow you to choose the best tradeoff between noise level and spatial accuracy.. Option 1 has the least noise and best localization. Option 3 has the best localization at the expense of a bit of mid-range noise, while option 2 is in-between.

Calibration files for other microphones will be in the form of .wav files, one for each sampling rate. A .txt file can be used to tie files for different sampling rates together into one calibration setting. If you were not supplied with such a .txt file, VVOctoEncode can create one for you.

Loading Calibration Files

In order to load calibration files into VVOctoEncode, do the following:

1. Download the calibration files to your local disk
2. Unzip them if needed
3. Start a host program like Reaper or ProTools
4. Create a eight channel track and place VVOctoEncode on it (see placement below).
5. Press "Find Calibrations" and navigate to the place where you downloaded your files
6. Select the three .octo files in the case of a OctoMic. For other mics, select the .txt file if you have one or the multiple the .wav files otherwise then give this calibration a short name

The calibration files you just loaded should now show up in VVOctoEncode using the name you gave them. You can delete them be pressing the 'x' next the name. Delete and find them again to change the name. You can have several calibrations loaded at once.

VVOctoEncode actually searches several places for calibration files, depending on operating system:

Windows:
```
Documents\VVAudio\calibrations
C:\Program Files\Common Files\VVAudio\calibrations
C:\Program Files (x86)\Common Files\VVAudio\calibrations
C:\Program Files\VVAudio\VVMic\calibrations
C:\Program Files (x86)\VVAudio\VVMic\calibrations
```

MacOS:
```
~/Library/Application Support/VVAudio/calibrations
/Library/Application Support/VVAudio/calibrations
~/Library/Audio/Plug-Ins/VST/calibrations
/Library/Audio/Plug-Ins/VST/calibrations
```

You can see where VVOctoEncode found the calibration files it is using down at the bottom of the plugin's window.

Setting Address Mode
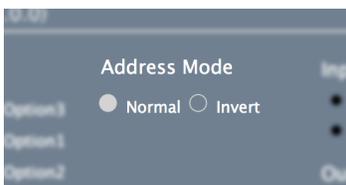
Address mode refers to which side of the mic is facing the front. Since hybrid second order microphones like the OctoMic provide less spatial data in the vertical plane than the horizontal, end-fire use is not recommended. Normal refers to the handle pointing down and invert refers to the handle pointing up.

Activity Lights
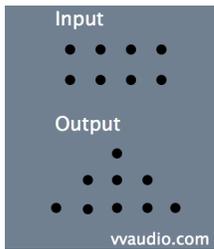
The activity lights show when there is signal at the input and output. They start out black, then as the signal gets louder, they get brighter green, then fade to yellow and finally turn red at -1 dBFS. The main point of the input light is to make sure all eight channels are getting to the plugin and not, for example, getting mixed into the first two. The output lights mostly show when clipping might occur. Note that many microphone calibrations add considerable bass so the output will often be louder than the input.

Placement

VVOctoEncode must be placed on the right kind of track to be useful. In Reaper, this can be any track with eight or more channels. In ProTools, this a 7.1 track. VVOctoEncode will nearly always be the first plugin in the track since most types of processing will disturb the spatial info. Changing the gain identically on all eight channels is acceptable.

Routing

Setting up the routing in your particular host software varies considerably depending on the host. The thing to remember is that all eight mic signals must get to the same copy of VVOctoEncode. You should not use multiple copies of VVOctoEncode unless you are mixing multiple microphones. It can be as simple as this:

VVOctoEncode   VVDecodeH

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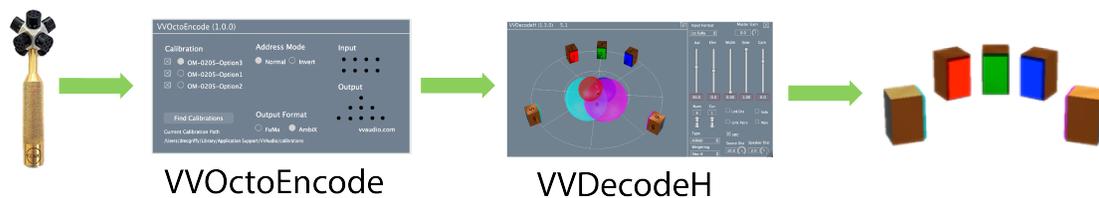
Single 8-channel file

If you have recorded to a single, eight channel file, then the routing and plugin placement is quite simple, at least as far as VVOctoEncode. Create a eight-channel track for the file and insert VVOctoEncode as the first plugin on it. In ProTools this should be a 7.1 track. You can put other ambisonic plugins after this or mix the resulting B-format with other ambisonic sources.
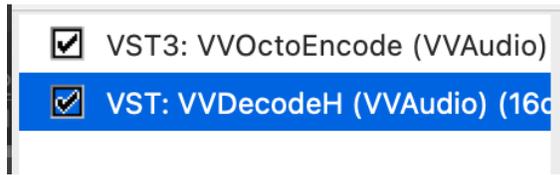
ProTools   Reaper

Eight mono files

If you have four mono files, place each one on a separate track. Then each of these four tracks must be routed to one of the four channels of a fifth track. VVOctoEncode is placed on this fifth track. To see how this works in various hosts, look at the templates included with the plugin download. In ProTools you must create a 7.1 bus with eight mono sub busses.

ProTools Quad bus with sub busses

In Reaper, you can route the mono tracks to the channels of the fifth track directly.
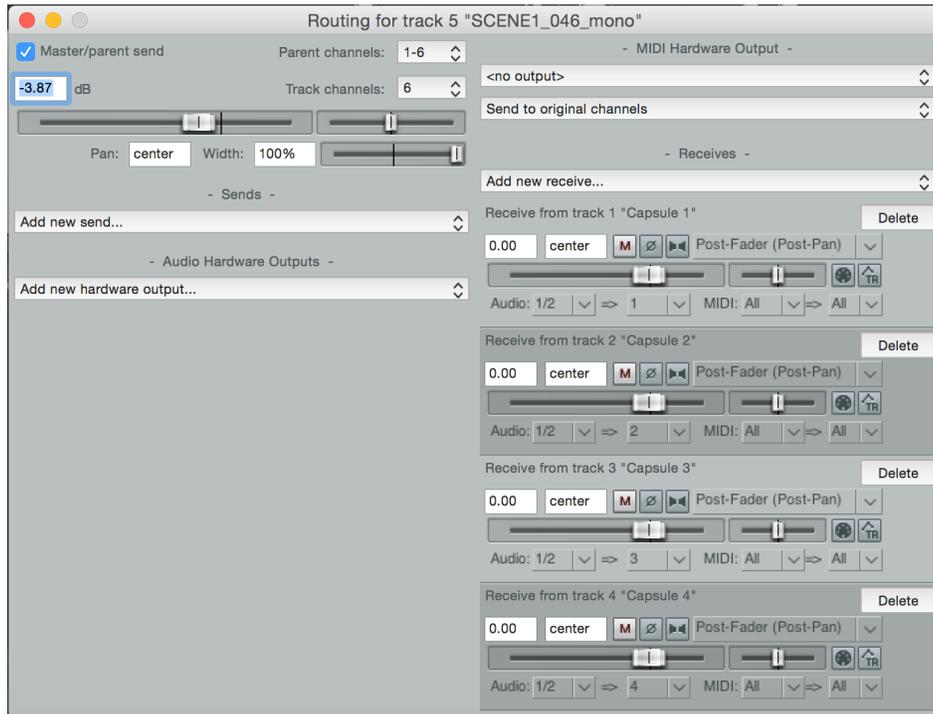

Reaper

Ambisonic Workflows

Ambisonics can do lots of things. Here are a few common cases.

Field recording for stereo

While people generally associate ambisonics with surround sound, it can be very effective at producing stereo content as well. Having captured the complete soundfield, you can then use a decoder to produce a pair of virtual microphone outputs in post production. This allows you to choose the direction and directivity of each microphone back in the studio. You can make the stereo spread wider of narrower to control the stereo image. You can choose from cardioid, hyper-cardioid, figure-8 or anything in between to control the amount of room sound.

Encode — Ambisonic Processing — Decode — Traditional Processing
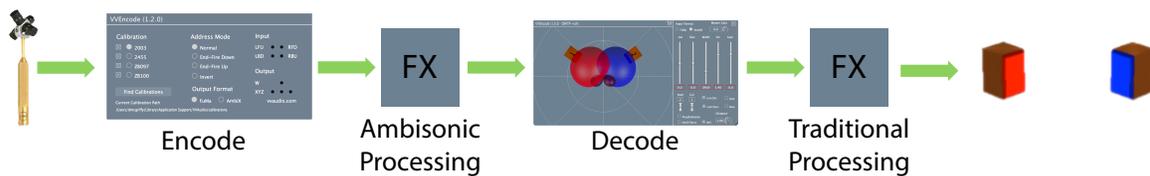
Between the encoder and decoder you can you any of the increasing number of ambisonic specific effects available. After the decoder, you can use standard stereo effects like EQ or limiters just as you would with any stereo recording. Also note that while it is usual to archive the raw recording and the final master, with ambisonics it often makes sense to save the B-format result of the encoder. This will allow you to remaster the recording in the future without needed the calibration files for the specific microphone used.

Field recording for surround

For basic surround recording with a single, ambisonic microphone, the process is exactly as described above for stereo, except you choose a different preset on the decoder and use surround aware plugins after the decoder.

Encode — Ambisonic Processing — Decode — Traditional Processing
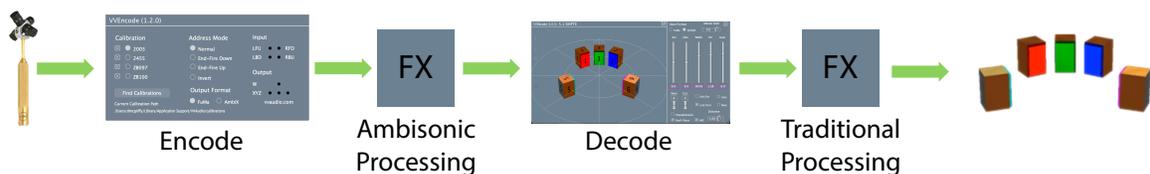
This ability to take the exact same session with all of its editing and processing and render it first to stereo and then to surround with the flick of a switch is part of the power of ambisonics. You could even send the same B-format signal to two decoders and render both at the same time.

Mixing with Ambisonics

Most productions will use more than a single microphone, of course. You can combine ambisonic and other sources in a mix in a couple of ways. If your target format is stereo, 7.1.2 or any traditional format, then you place both the encoder and

the decoder in sequence on ambisonic tracks and set the decoder output to match
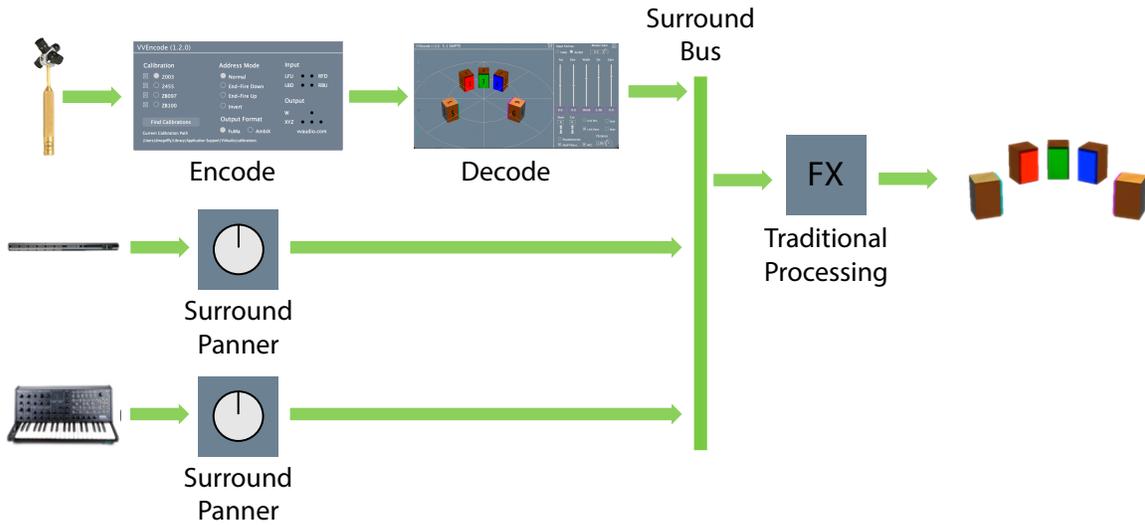
the format of your main bus. Other channels are mixed using standard panners. If your target format is ambisonic, perhaps for a VR production, then use an ambisonic main bus with ambisonic panners and encoders to mix your sources into this bus. Then route the main bus to the master channel or an aux track with any ambisonic processing you want and a decoder for monitoring. When it's time to export the results you can either disable to decoder or render from the bus prior the decoder. Here's how that looks:

9