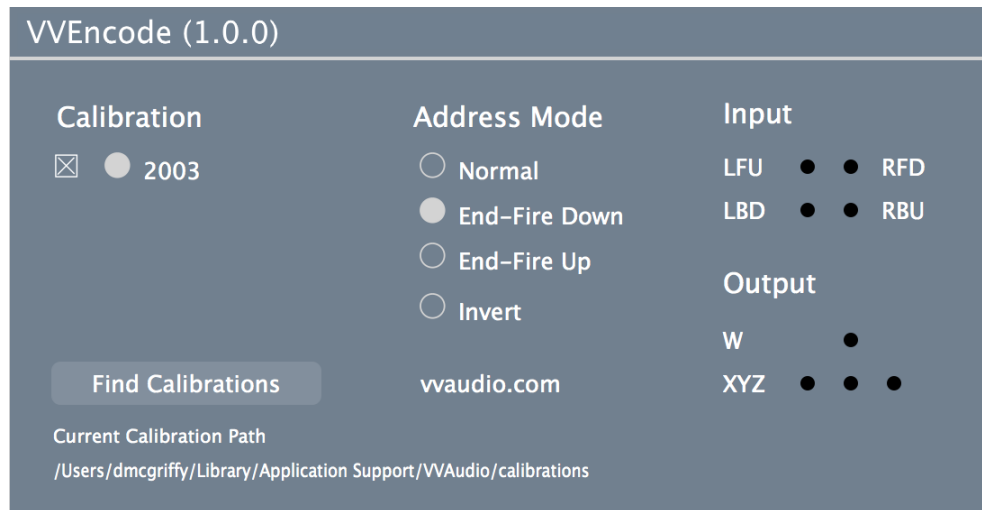


Getting Started with VVEncode



This document will help you get started using the VVEncode plugin from VVAudio. VVEncode takes signals from a tetrahedral microphone (called A-format) and converts them into B-format using the calibration files supplied by the manufacturer. Both the TetraMic and Brahma are supported.

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 surround sound.

We will cover the installation, setup and use of VVEncode. With this, you should be able to use VVEncode 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 VVEncode fits into this larger picture.

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Installation

Before installing VVEncode, 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.

OSX

The OSX versions of VVEncode are distributed as a .dmg file with the plugin bundles and aliases to the appropriate directories. Drag the required plugin into the appropriate folder.

Windows - VST

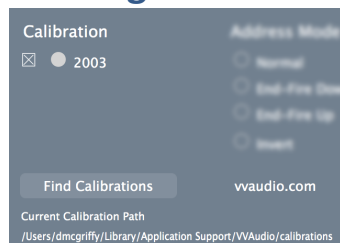
In Windows, VST's can go anywhere and most VST hosts have some way of choosing the VST directory. For example, the default directory for VST plugins for the 32-bit version of Plugue Bidule is "C:\Program Files (x86)\Plogue\Bidule\VSTPlugins".

The Windows distribution contains two VST plugins, for either a 32 or 64-bit host. Copy the appropriate .dll file to the location you have chosen for your plugins and make sure that your host is set to use that directory.

Windows - AAX

ProTools AAX plug-ins go in "C:\Program Files\Common Files\Avid\Audio\Plug-ins". The plugin itself is actually a folder, whose name ends in ".aaxplugin". Copy this folder and all of its contents into the directory above.

Loading Calibration Files



Both the TetraMic and Brahma are supplied with individual calibrations files. If you have previously been using VVTetraVST or VVMic, then VVEncode will find the files where they are. If have not previously used your calibration files, then 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 four channel track and place VVEncode on it
5. Press "Find Calibrations" and navigate to the place where you downloaded your files
6. Select either the .txt file in the case of a TetraMic or the folder containing the .wav files in the case of a Brahma and give this calibration a short name

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

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

Windows:

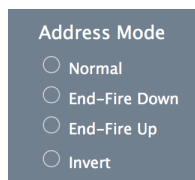
```
Documents\VVAudio\calibrations
C:\Program Files\Common Files\VVAudio\calibrations
C:\Program Files (x86)\Common Files\VVAudio\calibrations
C:\Program Files\VVAudio\VVMic\calibrations
C:\Program Files (x86)\VVAudio\VVMic\calibrations
```

OSX:

```
~/Library/Application Support/VVAudio/calibrations
/Library/Application Support/VVAudio/calibrations
~/Library/Audio/Plug-Ins/VST/calibrations
/Library/Audio/Plug-Ins/VST/calibrations
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You can see where VVEncode found the calibration files it is using down at the bottom of the plugin's window.

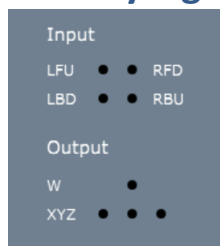
Setting Address Mode



Address mode refers to which side of the mic is facing the front. With tetrahedral microphones, the whole idea is to make it as close a possible to perfectly symmetrical, but sometimes it is more convenient to have the handle of the mic facing up or back. This chart explains the different modes:

Mode	TetraMic	Brahma
Normal	Handle down, logo forward	plug down, serial # forward
End-Fire Down	Handle back, logo down	plug back, serial # down
End-Fire Up	Handle back, logo up	plug back, serial # up
Invert	Handle up, logo forward	plug up, serial # forward

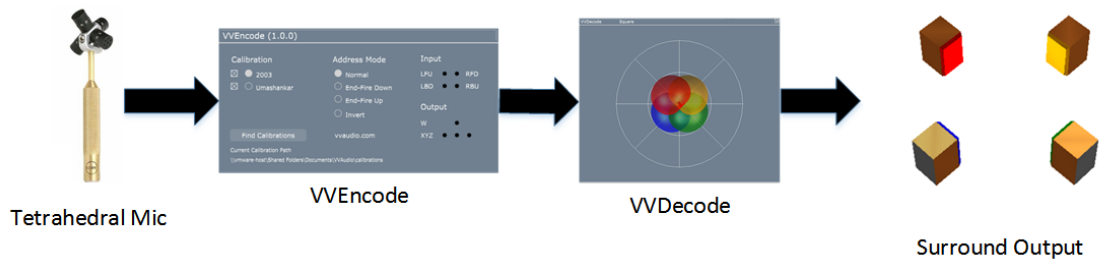
Activity Lights



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 four 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 most tetrahedral mic calibrations add considerable bass so the output will often be louder than the input.

Routing

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

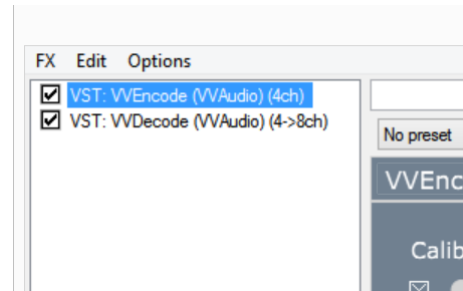


Single 4-channel file

If you have recorded to a single, four channel file, then the routing and plugin placement is quite simple, at least as far as VVEncode. Create a four-channel track for the file and insert VVEncode as the first plugin on it. In ProTools this must be a “quad” track. You can put other ambisonic plugins after this, as discussed below in Routing, or mix the resulting B-format with other ambisonic sources.



ProTools



Reaper

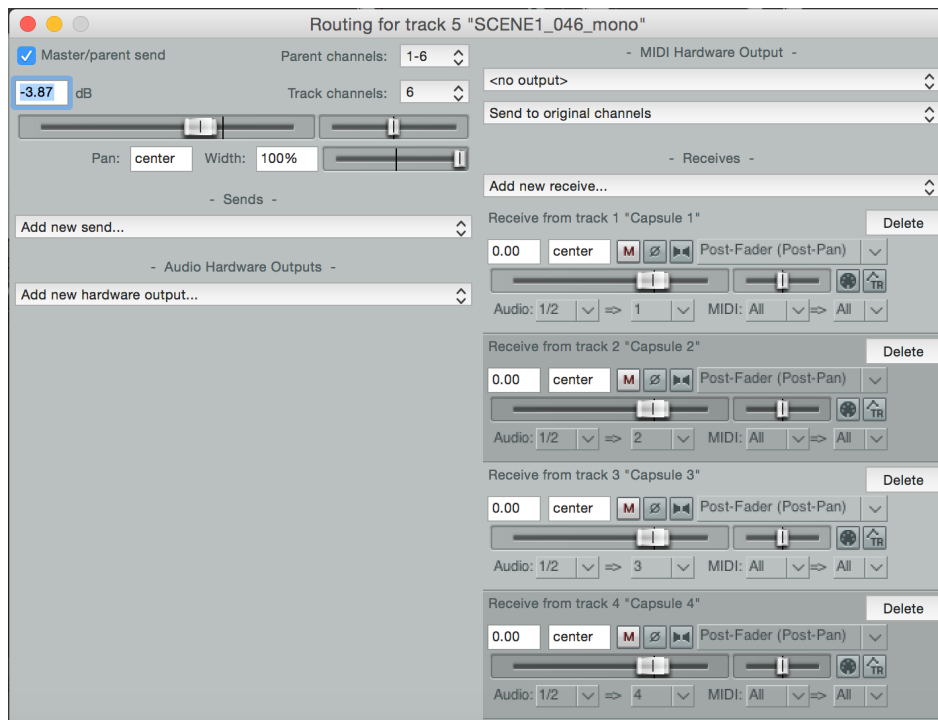
Four mono files

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. VVEncode 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 quad bus and then pan each mono track hard to a corner.



ProTools

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



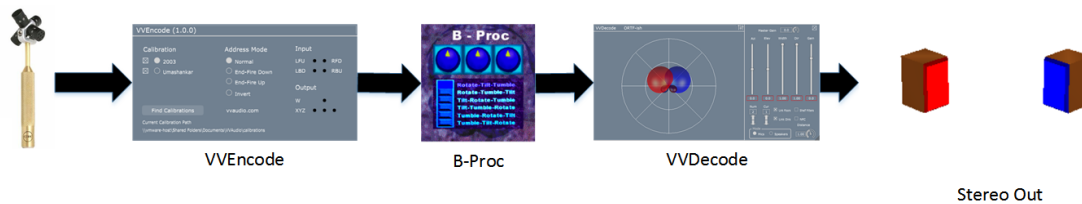
Reaper

Ambisonic Workflows

Ambisonics can do lots of things. Here are a few common cases. Note that while VVDecode and VVDecodePro are shown, there are many ambisonic decoders to choose from. A couple of free options are VVMicVST (<http://vvaudio.com/downloads>) and SurroundZone2 from SoundField TLS (<http://www.tslproducts.com/soundfield/soundfield-surroundzone2>).

Field recording for stereo

A field recordist goes to an event and captures four channels straight from a tetrahedral mic. Even though the target format is stereo, by capturing two extra channels, the direction and pattern of the virtual left and right mics can be adjusted in post production. You can narrow the pattern to reduce reverb or point right at a favored source. The processing for this is straightforward. After routing the signals to VVEncode as described above, you can insert any B-format plugins like rotate and then a decoder, like VVDecode, all on a single channel.

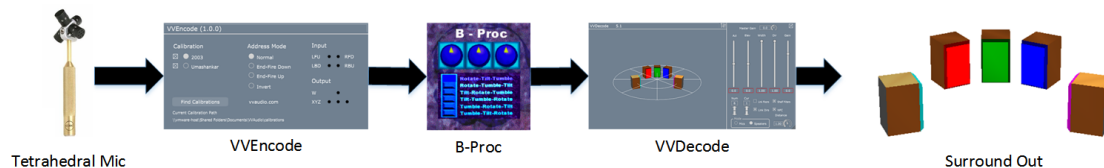


Note: B-Proc is a ambisonic rotate VST available from the York University Music Technology Group:

http://www.york.ac.uk/inst/mustech/3d_audio/vst/welcome.html

Field recording for surround

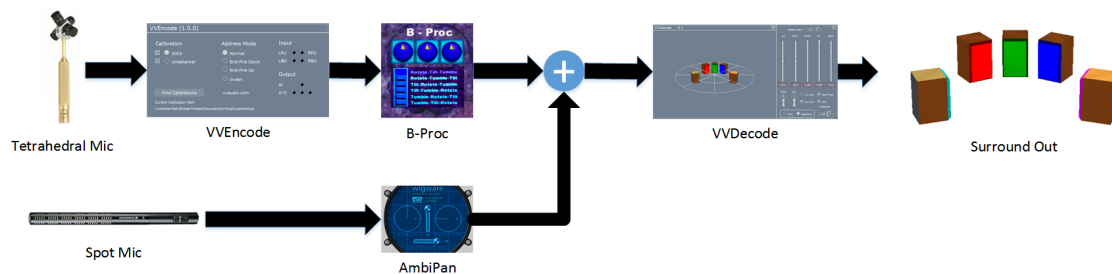
For basic surround recording with a single, tetrahedral microphone, the process is exactly as described above for stereo, except you choose a different preset on the decoder.



This ability to take the exact same session with all of its editing and processing and render it once 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.

Field recording with spot mics

Sometimes the purist, single mic technique needs a little help from spot mics. We start with the basic surround signal chain and add a spot mic channel with an ambisonics panner plugin like Wigware's AmbiPan. In this case, the bus of your mixer will be B-format and the decoder will go on the master track. The same technique can be used for stereo, of course.

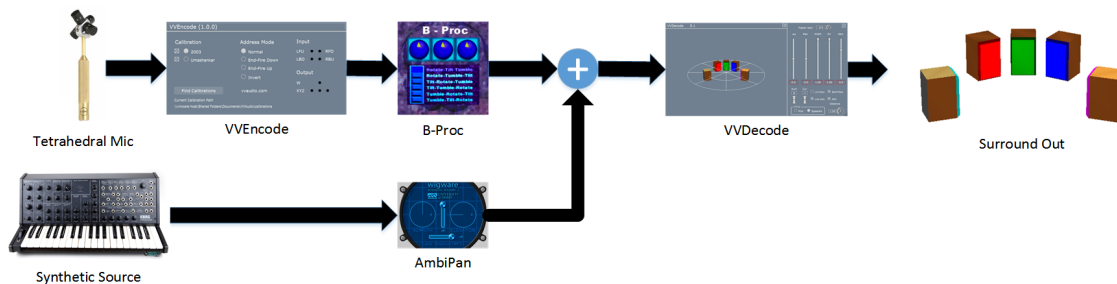


Note: AmbiPan is an ambisonic panner VST available from Bruce Wiggins:

http://www.brucewiggins.co.uk/?page_id=78

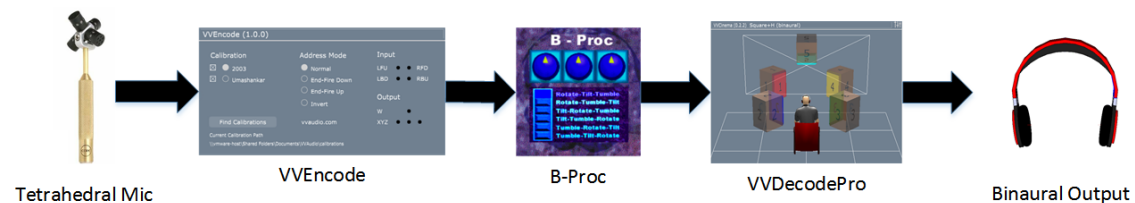
Mixing live and synthetic sources

Ambisonics is not just about live recording. Live material can easily be mixed with synthetic sources, or a bunch of synthetic sources mixed on their own. Ambisonic panners can place a sound anywhere in 3D and can include diffusion. The routing looks much like the spot mic case above.



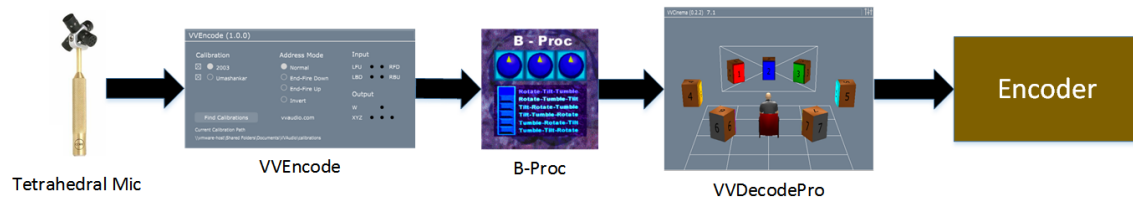
Binaural

Producing good binaural from B-format is a complicated process, but all you have to do is choose the right plugin and set it to binaural output. If you have a head tracker on your headphones, you can connect it to the rotate plugin.



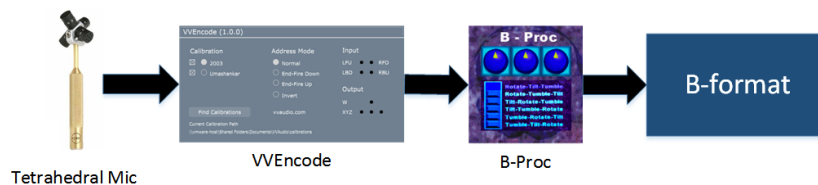
Producing 7.1 for VR

Some VR systems, for example Samsung's GearVR, require sound to be delivered already decoded for one of a few standard speaker layouts. This becomes a standard surround workflow like any of those above. You should consider using a parametric decoder for layouts of 7.1 and beyond.



Producing B-format for VR

As VR advances and ambisonics becomes better known, some game development frameworks, like Unity, are starting to support B-format directly. The game engine can then combine this signal with its other forms of audio rendering, delaying the decode until runtime. While this may be an advanced ambisonics technique, it makes our workflow very simple since we don't need a decoder at all.



Of course, you will need a decoder in the studio to monitor your work and it will no doubt work best if you can use a head tracking system while editing. But you could monitor in 7.1, knowing that the results will transfer perfectly to the head tracked, binaural rendering of the game engine. This once more, is the power of ambisonics.