

BRAHMA-IN-ZOOM

AND THE A-FORMAT TO B-FORMAT CONVERSION
USING THE CURRENT USABLE TECHNOLOGIES
ON MAC OSX

(PART 2B: VVENCODE AND NUENDO)

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FOREWORDS

With the actual technologies we can finally use the Ambisonics microphone technique at its best, thanks to an amount of tools available on the market at various prices. A whole lot of possibilities are now open thanks to the ultra versatile B-format that can be converted to any delivery format, if the right tool has been developed.

Being a single point coincident microphone technique, is very easy to use it on the field. Once you find a nice sounding spot, you position the microphone there and record, leaving all the magic to when you are back in the studio.

There is still a weak step of this technology that makes it a bit challenging to be used and are the microphones with tetrahedral capsule configuration. These microphones deliver a 4 tracks output called A-format which is the raw recording of each capsule straight to the used recorder. There are not many tools out there to help you with that, specially when you have calibrated microphones in need of their specific Filter Matrices to be properly aligned to give to the final B-format a correct spatialization and frequency response.

With the actual boom of the VR market, almost every Sound Engineer out of the blue became an expert of Ambisonics and this is due also to the release on the market of microphones sold as already calibrated in the factory giving the user the chance to by pass this delicate step no matter if the final B-format won't be precise and sounding at its best, but is not important because the rest of the world is deaf, right?

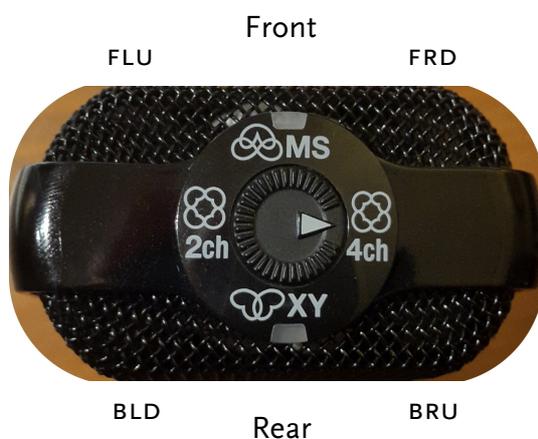
Anyway, I am here to talk about how to do things properly, hence the need of pointing the lack of tools for this step as I am about to explain.

THE BRAHMA IN ZOOM MICROPHONE/RECORDER

I came across the Brahma-in-Zoom by chance and without telling the whole story, I found this little object in my hands and honestly I was scared for many reasons. I was scared because is a new recorder I have to learn on top of the billions of recorders I have to know by heart for work. I was scared to break it as it looks engineered and built with cheap plastic for the lower end Sound community. I was scared because it was on a loan and I had a lot of responsibilities for sending it back, once tested, as it was when I received it. I was scared because the tetrahedral mod is scaring.

Once started using it all the scary bit dissipated slowly and this microphone/recorder became soon an interesting piece of gear to use.

A couple of things have to be known to operate this microphone correctly. The first one is that the front of the mic is the back of the recorder (where the AA batteries compartment is),. This means that to record correctly we point the rear of the recorder to the main incoming sound source while looking at the display. It seems a bit confusing but is the way we normally operate any recorder.



The second one is that for some reason, when the recorder is on 4ch mode the MS capsules are recorded as MS stereo and there is no chance (unless of a new firmware fix) to record the two capsules as raw. So make sure to keep the side capsule level at \emptyset ($S = \emptyset$) to match the recorded Filter Matrix that will fix this software annoyance.



The Ambisonics recorded files are located in the "4 CH" folder, where two sets of stereo tracks are waiting to be processed.

The track assignment for the two files is:

XY = 1 - 2

MS = 3 - 4

A-FORMAT TO B-FORMAT CONVERSION WITH NUENDO (v. 7.1)

Despite still some routing restrictions, Nuendo is the most powerful DAW for most of the audio for moving pictures work out there and its price is mirroring it.

When doing an A-format to B-format conversion, what we technically have to do is to convert a 4 tracks recording to a 4 tracks file, which is the key to set our session up for the purpose.

In your brand new session make sure your mixer track is set to manage 4 channels. To see the mixer select the menu:

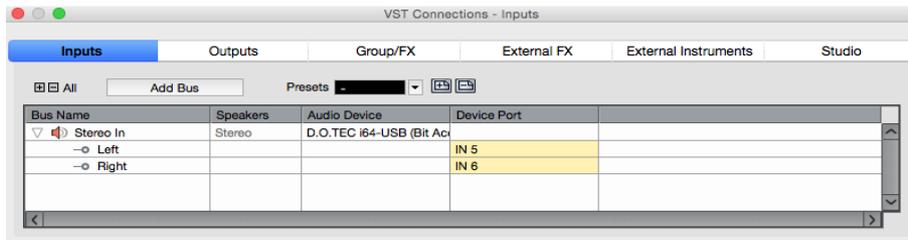
Devices – MixConsole (F3)

or click on the mixer window if it is already opened and the empty mixer “desk” with only the Master output visible will pop up.



In this case we are starting from an empty session which has only stereo input and stereo output activated (or your previous session's settings). To create a Master Output with 4 channels we need to get into Nuendo's Matrix, called VST Connections:

Devices – VST Connection (F4)



For the sake of a 4 possible Ambisonics recording, we will set up also the Inputs to manage 4 channels and delete the default stereo channel.

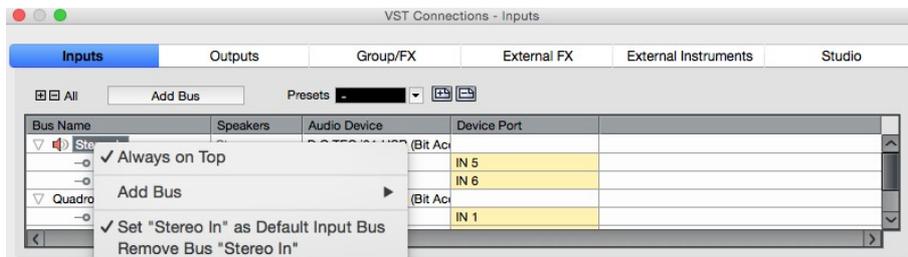
In the Inputs page, click on "Add bus" and a "Add Input Bus" window will pop up



Here is where Nuendo could be improved. Only few specifics formats are available and the user cannot create a new one for personal use or to match different standards criteria. Luckily for our purpose we can select the "Quadro" item and pretend is our 4channel A-format Ambisonics Input.

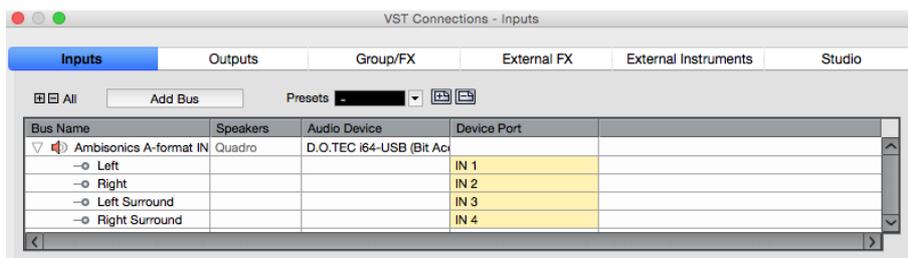
Once selected a new "Quadro" input will show up with inputs assigned in a progression by the software.

If not needed, to avoid confusion we can delete the Stereo Input (but if needed, by all means leave it there). Right-click on "Stereo Input" and from the scroll down menu select "Remove Bus Stereo In"

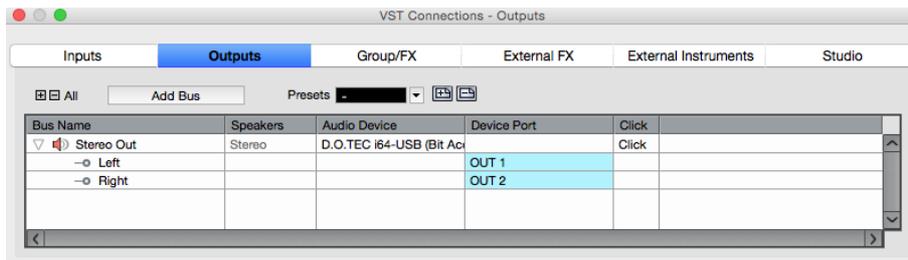


The left "Quadro In" input will now have a red loudspeaker on the left, meaning it's the default input, which is what is needed.

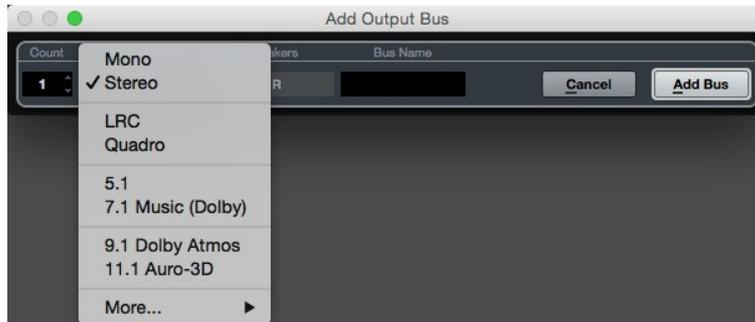
For our purpose we can name it "Ambisonics A-format IN" and make sure the assigned inputs are in the right order.



Then do the same with the Outputs:



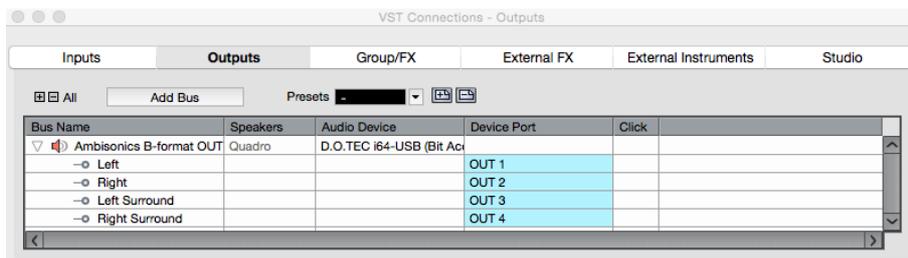
Click on “Add Bus” and the “Add Bus Output” will pop up.



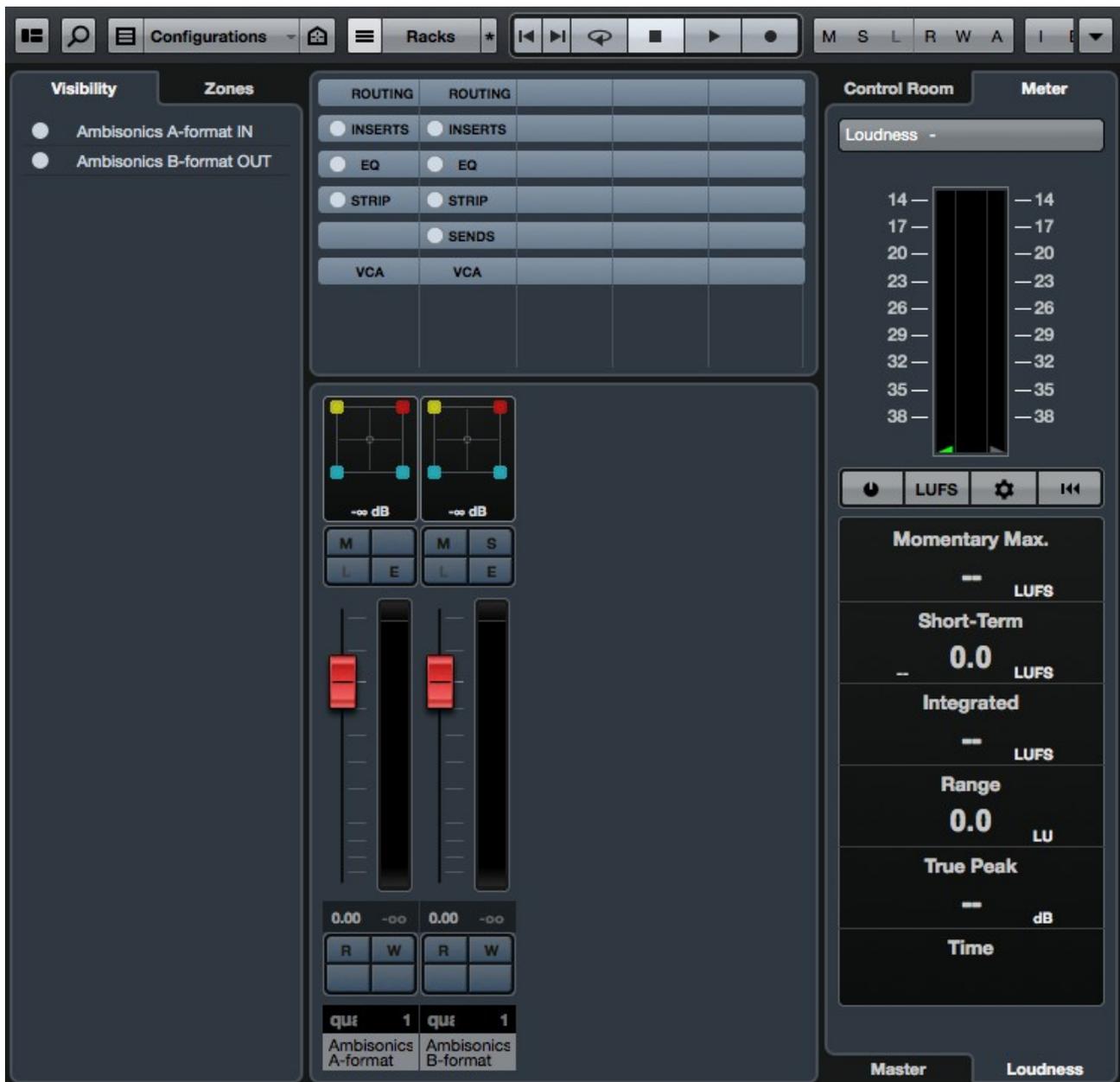
Select “Quadro” and then proceed to delete the Stereo Out and rename it “Ambisonics B-Format OUT”.

Make sure there is a red loudspeaker on its left, meaning is our default output, which is what is needed.

Make sure the outputs are in the right order.



Now our session is ready to manage our 4 tracks recordings in Ambisonics stream and the empty mixer has inputs and outputs with surround panners:



To match the way the Zoom H2n saves its files, we need to create two stereo tracks, one for the XY file and the second one for the MS file and match the Brahma-in-Zoom track assignment. To do this in Nuendo select the menu:

Project – Add track – Audio

or in the Project Window you can right-click on the Track list and select “Add Track”. Also in the project window you can press the little “+” sign on the top right of the Track list, the one close to the magnifying glass.

Also in the fader section of the MixConsole you can right-click and select “Add Track”. An “Add Audio Track” window will pop up:



Where we need to create 2 stereo audio tracks and rename them accordingly:

XY 1 – 2

MS 3 – 4

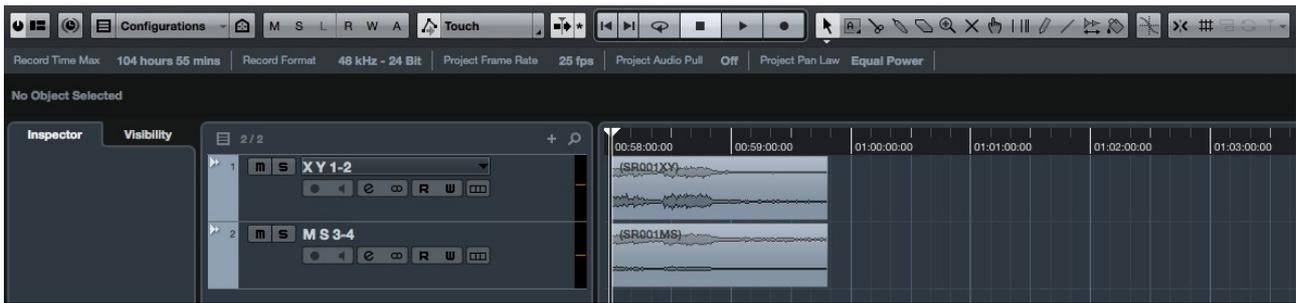
By default both of them will be assigned to the two front speakers or the Quadro configuration, which means OUT 1–2.



To assign the MS track to its corresponding Outs 3-4 we need to double click on the multipanner of that track and assign it to the rear channels of the Quadro configuration, which means Outputs 3–4.



Once done, we can import our pre-recorded files on the Project Window as Events where they can be edited, if needed.



Once in place, playback to make sure the tracks are assigned and playing back correctly. On the MASTER channel we can finally insert VVEncode plugin to finalise the B-format conversion.

Click on one of the Track Inserts and the “Add FX to Master Track” window will pop up from where we need to choose VST: VVEncode.

The VVEncode window will pop up and our MASTER channel will have VVEncode in one of its inserts.

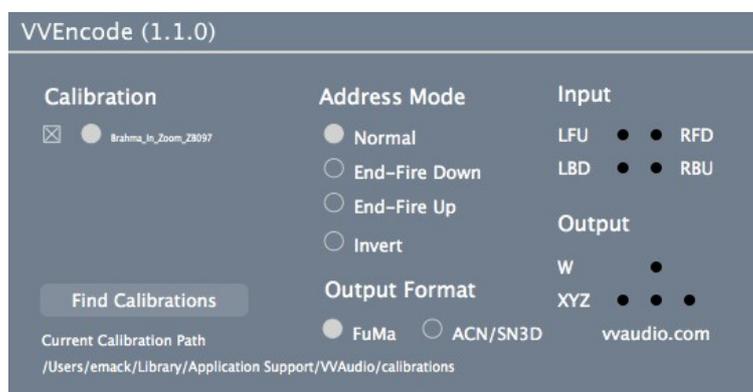
Select the folder where you keep your Filter Matrix files and then select ALL the matrices you have in there and click “Open”. A pop up window will now ask to enter a name for your calibration files, if is the first time you are running it:



In my case I named it : “Brahma_In_Zoom_ZB097” which is the model I have.

This way VVEncode will copy the Matrices files in the just named folder and create a reference .txt file into the “Current Calibration Path” described in the lower left side of the plugin. There is no need to redo this again once is set in your computer but is needed to be redone in case you have more than one Ambisonics microphone.

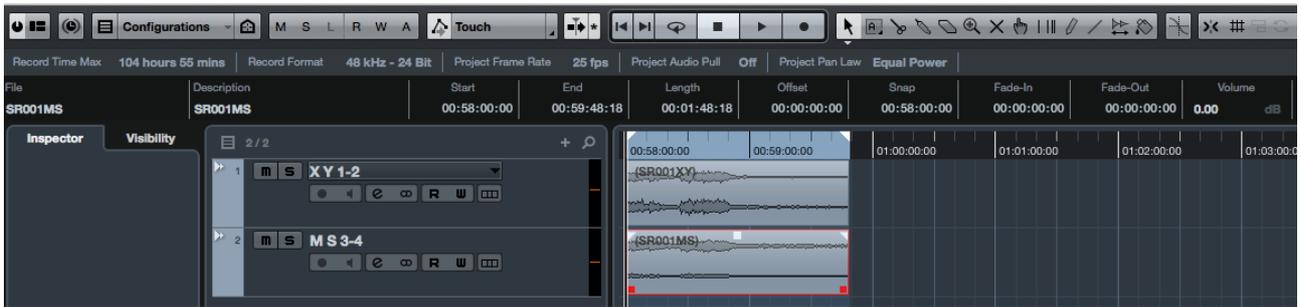
VVEncode should be now up and running reading the right Matrix for the microphone:



By default Brahma Filter Matrices should be the FuMa version and in VVEncode you can decide what final B-format you can deliver. Also you can tell the software how the microphone was positioned during the recordings (Address Mode) to the re-arrange the spherical plan correctly. Once happy with the edits and ready to export the resulting B-format, click on the event or events

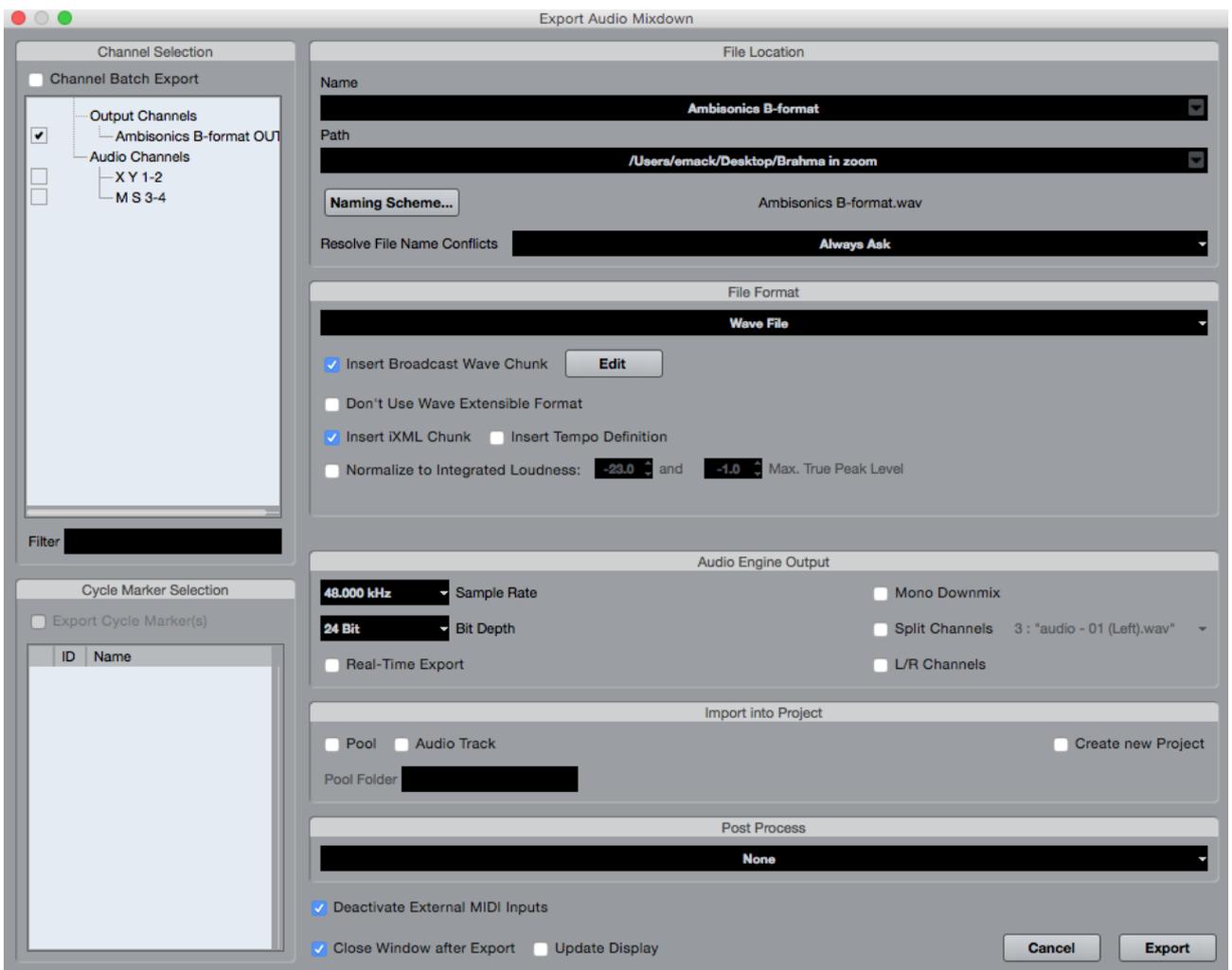
to have them highlighted in red and select:

Transport – Locators to selections (P)



now the right events are selected we can proceed to the export via:

File – Export – Audio Mixdown



You should now have a beautiful B-format (your selected version) of your great sounding recording!

The template for this example is called “brahma_in_zoom_AtoB_o2_vvencode.npr”

REFERENCES

Brahma In Zoom: <http://embracecinema.com/gear/product-view.php?slug=brahma-in-zoom>

Angelo Farina's reference website: <http://pcfarina.eng.unipr.it/Ambisonics.htm>

Getting started with VVEncode: <https://www.vvaudio.com/sites/vvaudio7/files/Getting%20Started%20with%20VVEncode.pdf>

DOWNLOADS

Nuendo: https://www.steinberg.net/en/products/nuendo_range.html

VVEncode: <https://www.vvaudio.com/products/VVEncode>