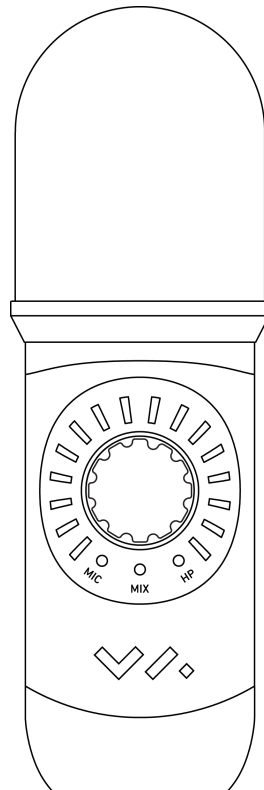




voyage audio

Spatial Mic USB/ADAT



User Guide
Version 2.0

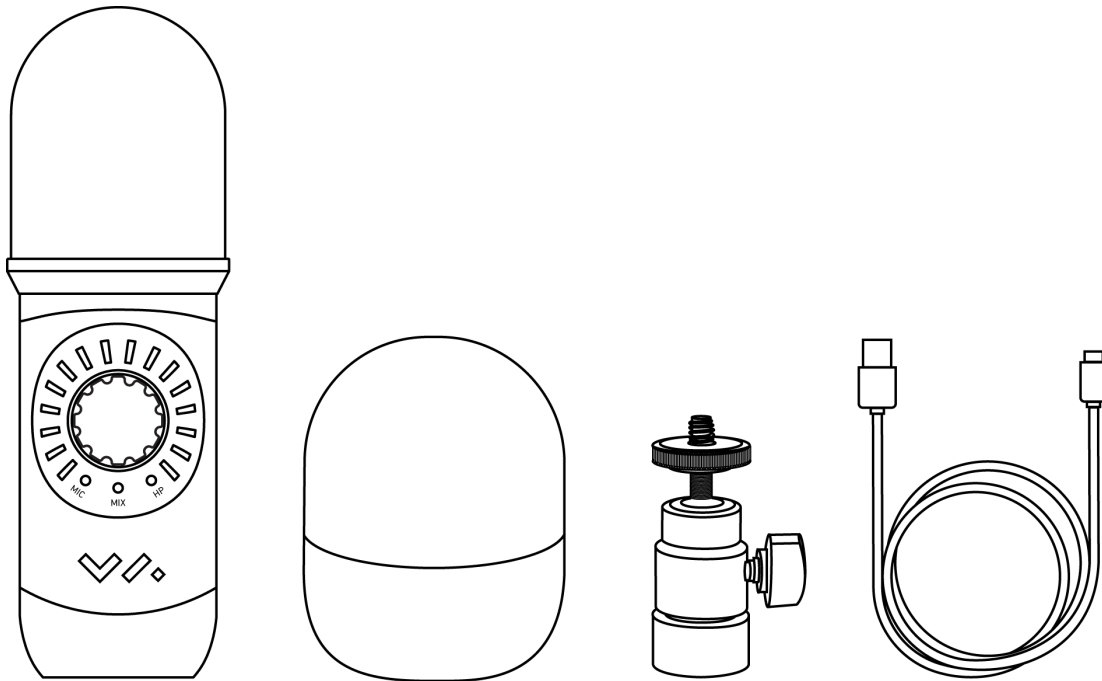
Package Contents	4
Introduction	4
Requirements	5
Background	5
Getting To Know Spatial Mic	8
Mounting	8
Powering	8
Outputs	9
Controls	10
USB Audio Recording	12
Mac OSX	12
Windows 10	16
Mobile Devices	21
iOS	21
Android	24
USB Notes & Troubleshooting:	26
Using Your Microphone	27
Positioning	27
Recording Tips	27
Care & Maintenance	28
Spatial Mic Converter	29
Overview	29
Spatial Mic Control	31
Overview	31
Usage	31
Controls & Interface	31
Installation	32
Specifications	33
Warranty	35
Certifications	35

Support & Contact 37

Third Party Tools & Notices 38

Package Contents

- Spatial Mic
- One (1) USB C to C and one (1) USB C to A cable, 3 meter, black nylon braided
- 1/4-20 to 5/8" mini swivel ball hard-mount
- Foam windscreen
- Quick-start guide
- For Download: Spatial Mic Converter installer for OSX & Windows including: VST3[®] plugin (Mac OSX & Windows), AU (Audio Unit for Mac OSX) and AAX (Windows & Mac OSX)
- For Download: Spatial Mic Control standalone app (Mac OSX & Windows)
- For Download: User Manual



Introduction

Thank you for purchasing Spatial Mic! With 8 high-quality capsules, digital connectivity, live monitoring and a dedicated DAW plugin for output conversion, Spatial Mic helps you capture immersive 3D audio, surround sound, rotatable stereo and beyond.

Spatial Mic records the entire sound-field with precision. Signals from 8 capsules, encoded with Spatial Mic Converter plugin result in a second order ambisonics representation of your audio

scene. This allows for stunning spatial resolution, engaging listeners as immersive sound moves around their heads. Additionally the plugin can be used to create virtual mono or stereo microphones which can be aimed anywhere in the sound-field and up to 7.1.4 surround sound.

Designed for audio engineers, producers for AR/VR, game sound-designers and 3D audio pioneers, Spatial Mic is a next generation 360 microphone. Spatial Mic and the included Spatial Mic Converter plugin (VST, AAX & AU) offer substantial improvements over existing solutions:

- Enhanced spatial resolution, pattern decoding, directivity & optimal listening area vs first order microphones and less phase issues than with spaced arrays.
- Future-proof output — may be decoded to any listening format live or in post and is not locked to one specific configuration like 2-channel binaural microphones.
- Output may be head-tracked and used natively with content delivery tools from [YouTube](#), [Facebook](#) and [Google Resonance SDK](#).

Streamlining the recording workflow when dealing with multi-channel microphone arrays was a top priority during the development of Spatial Mic. With built-in USB and ADAT connectivity, no external mic preamps, multi-channel cables carrying analog signals or converters are needed. Along with purity of signal, an individual calibration profile stored within each mic ensures consistent quality.

We are excited for you to start recording with Spatial Mic. Please read this user manual and get to know everything this microphone package has to offer. Happy recording!

Requirements

- Host device supporting multichannel USB Audio 2.0 or ADAT lightpipe input.
- USB bus power via USB-C jack or external 5v / 500mA source via micro-USB
- DAW supporting multi-channel audio tracks like [Reaper](#), [Pro Tools Ultimate](#) or [Nuendo](#)
- Spatial Mic Converter plugin and Spatial Mic Control app have been tested to work on Mac OSX 10.11 and higher or Windows 10

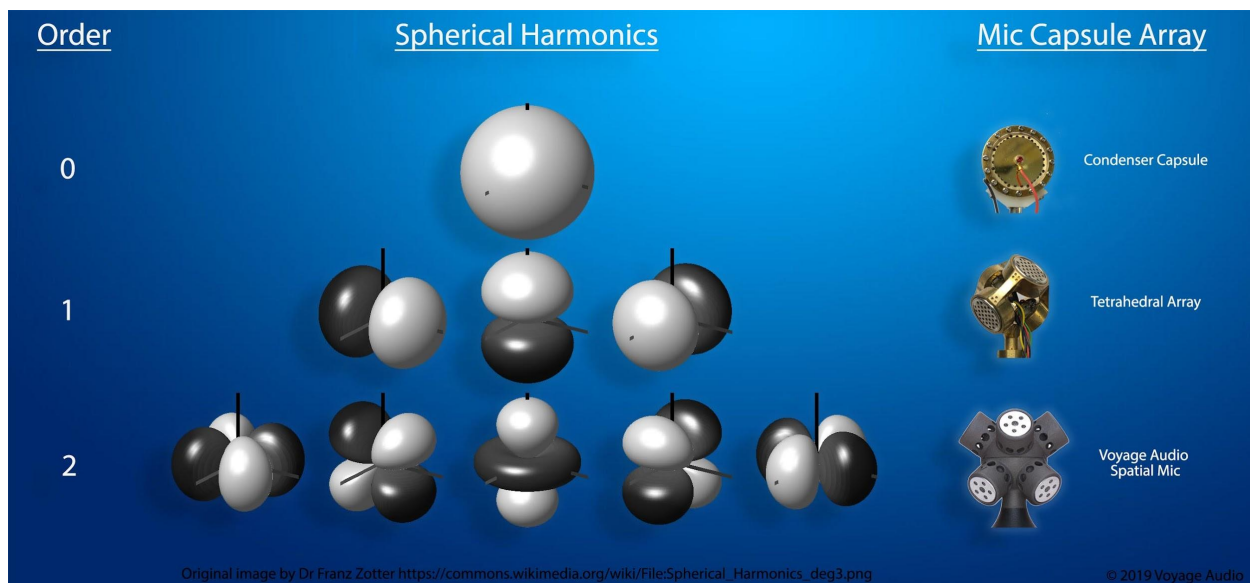
Background

When we record the signal from a traditional microphone, we put this on a track and assign it to a playback channel. We can play this back on one speaker and call it mono, or send it to two speakers, pan it left, right or center and call it stereo. We can also expand this to a larger 5.1 or even 22.1 surround system. In all of these cases we are relying on a channel based system to record and playback audio.

Channel based systems require the same number and configuration of loudspeakers to be used in production and playback. **Ambisonics** enables audio production and playback without using a channel based methodology, thus enabling reproduction on any number of speakers in varying configurations. The advantage of using ambisonics vs channel-based audio (i.e. mono, stereo, 5.1, etc) is that the signals are not related to speaker feeds. Because of this, ambisonics is a future-proof way of recording.

Ambisonics was first developed in the 1960's and '70's by passionate researchers as a way to **encode** a 3D sound field. To do this, the sound-field is decomposed into a series of [spherical harmonics](#). While a spherical harmonic series goes indefinitely, we are most interested in the first few "orders", which will give us enough spatial resolution to encode a realistic sounding representation of a soundfield. The encoded audio on DAW tracks will represent these spherical harmonics, instead of speaker feeds.

In the figure below, you can see that, as order increases, more spherical harmonics are needed. For example, a second order spherical harmonic representation of a sound field contains 9 components - all of the harmonics from the zeroth and first order, plus 5 more.



At the **zeroth order**, you can see that a single, omni-directional microphone capsule is capable of recording this harmonic. But what about the first and second order? To create these harmonics, the sound field must be sampled by a microphone array and then encoded. For **first order**, the traditional way is to use four microphone capsules in a tetrahedral configuration and was first pioneered by Michael Gerzon and Peter Craven in the 1970's. The 8 microphone capsules in the Spatial Mic array are encoded by the Spatial Mic Converter plugin to create the 9 spatial harmonics needed to represent a soundfield as **second order**. Any ambisonic soundfield representation greater than one is referred to as Higher Order Ambisonics (HOA).

When working with ambisonics, sometimes the raw capsule signals, pre-encode, are collectively called **A-Format**, while encoded signals are called **B-Format**. Ambisonics encoders, decoders and processors vary in the expected sequencing of the spatial harmonics and their encoded level (sometimes called weighting). The two most common are **AmbiX** and **FuMa**. Make sure the expected format for a given ambisonic processor matches the audio being sent to it.

Spatial Mic Converter encodes the raw capsule signals from Spatial mic to second order (9 channels) B-Format. Once in B-Format, audio can be sent to numerous sound crafting plugins. Here are some that work with Higher Order Ambisonics:

- [Fabfilter](#)
- [SSA](#)
- [Blue Ripple Sound](#)
- [Nosiemakers](#)
- [IEM Plugin Suite](#)
- [SPARTA](#)

Ambisonics may be **decoded** to almost any format desired (including channel-based) and stored in formats like [MPEG-H](#). The most common decoding method for ambisonics is called binaural, which is played back on stereo headphones. When decoding to binaural a Head Related Transfer Function (HRTF) is used to approximate how human anatomy affects spatial perception. For example, how does the frequency response of a single sound source change as you rotate your head in front of it? An HRTF aims to take this into account.

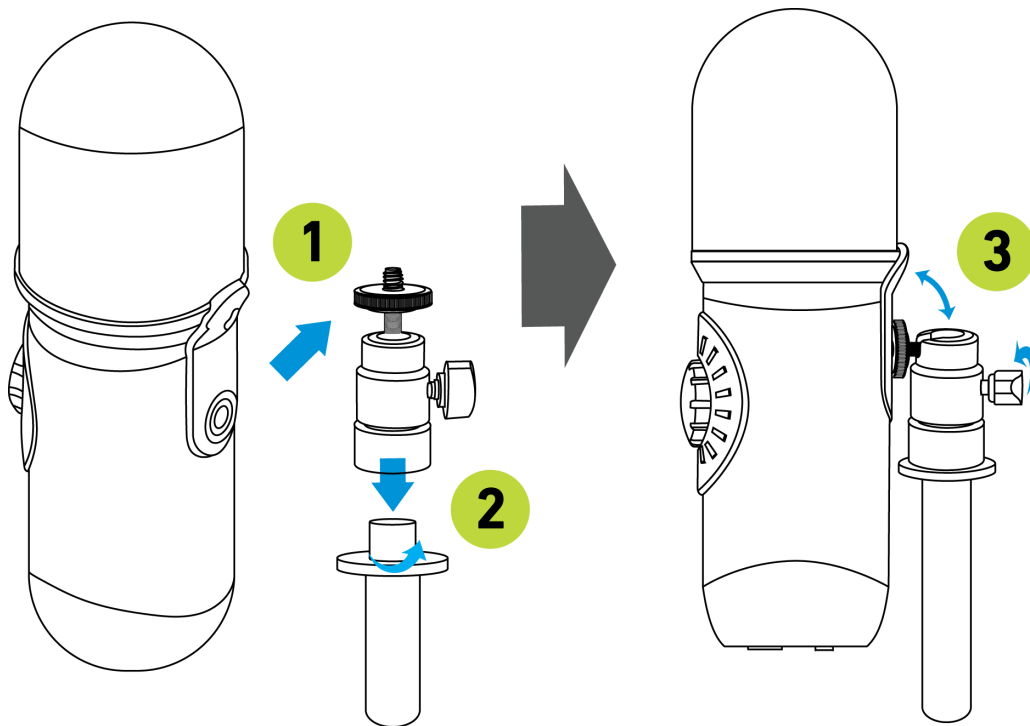
Ambisonics moves us beyond what has been possible with channel based formats, enabling applications in Augmented and Virtual Reality, music production, broadcasting and immersive environments. While ambisonics can be used in nearly any type of audio production, adoption is becoming more widespread. Here are some useful resources:

- [Reaper Ambisonics User Forum](#)
- [Oculus - Spatial Audio How-To](#)
- [YouTube 360](#)
- [Facebook 360 Spatial Workstation](#) (also check out how to [livestream](#))
- [Resonance Audio](#) - Spatial Audio SDK for Unity, Unreal, FMOD, Wwise, Web, Android and iOS
- [Ambisonics in Pro Tools](#)

Getting To Know Spatial Mic

Mounting

A 1/4-20 thread mount on the back of the mic allows for hard-mounting to a standard microphone stand. Screw the included 1/4-20 to 5/8" mini swivel ball hard-mount into the 1/4-20 threads on the back of Spatial Mic. Screw the other end into your microphone stand. Note that this method does not provide acoustic isolation from the mic stand.



For acoustic isolation, use a Rycote InVision shockmount (sold separately). Place Spatial Mic in the shockmount so the bottom of the mic is flush with the inner shockmount ring and tighten the screws around the mic. Ensure the microphone cannot slip out of shockmount and the knob can be accessed.

Powering

Spatial Mic can be bus powered through the same USB-C jack used for data transfer. Operation with a hub is not guaranteed (and beyond the scope of this user manual) due to the number and variety available. If attempting to use Spatial Mic with a hub, please ensure that it is self-powered and can provide 500mA to the mic.

When using the ADAT lightpipe digital output, power to Spatial Mic must be applied via USB-C jack or micro-USB.

Some mobile devices connected via USB may require power to be applied through the micro-USB jack. Using a USB battery or 5V AC adapter will also help to extend the battery life of your mobile device while recording.

Outputs

ADAT Lightpipe

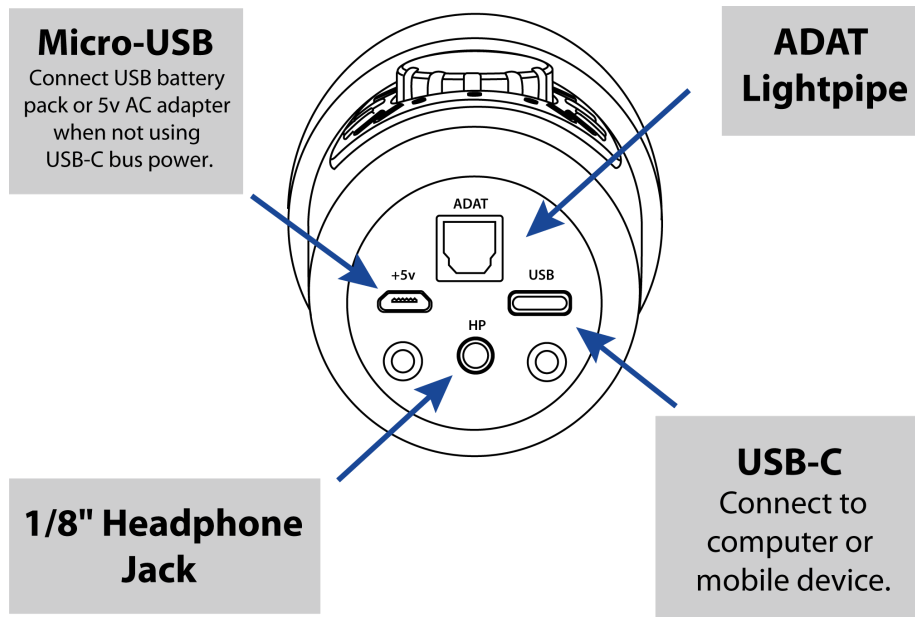
The ADAT Lightpipe output provides 8 channels of digital 24-bit / 48kHz uncompressed audio over a fiber optic cable. Connect a TOSLINK optical cable to the ADAT receptacle on the bottom of Spatial Mic and the other end to an ADAT lightpipe input. Follow the setup instructions for the connected device to receive 8 channels of audio from Spatial Mic. Spatial Mic must be set as the master clock unless you are using an asynchronous sample rate converter.

USB

Connecting Spatial Mic via a USB cable offers single wire connectivity to Windows, Mac OSX or mobile USB Audio 2.0 compatible host devices. Connect a cable with a USB-C plug into Spatial Mic and the other end into a USB port on the host device.

Headphones

Plug headphones into the 1/8-inch (3.5mm) stereo jack on the bottom of the microphone to monitor the capsule array in binaural (44.1kHz and 48kHz) or mid-side (88.2kHz and 96kHz) and host device playback in stereo. Note that the live headphone output uses a frequency independent first order ambisonics matrix and is intended for confidence monitoring only. For full fidelity, the microphone output should be encoded with the Spatial Mic Converter Plugin in a DAW.

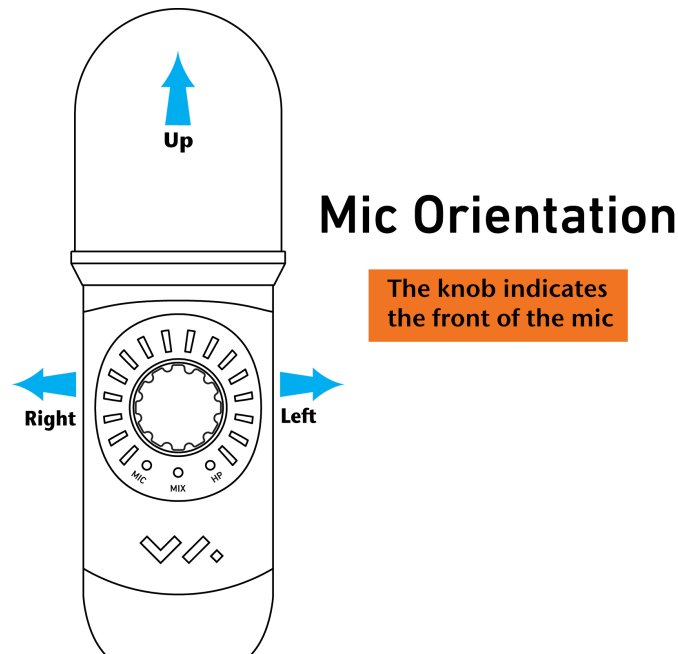


Controls

Knob

The anodized aluminum knob on the front of Spatial Mic indicates the front of the microphone and is used to change various aspects of the recording and monitoring configuration.

- **Push** the knob to cycle through modes:
METERING → MIC GAIN → MIX → HP LEVEL
- **Rotate** the knob to adjust selected mode
- **Push & Hold** knob to mute or unmute capsule signals



Metering Mode

When powering up Spatial Mic for the first time, the LED display will show a turn-on sequence and then default to metering mode showing individual capsule level. Default metering mode may be changed with the [Spatial Mic Control app](#). The metering modes that may be selected are:

- **Off** - no metering or LEDs on
- **Monitor** - LEDs display stereo L-R mix of Live binaural monitoring and host device playback.
- **Capsule** - LEDs display signal level for the 8 capsules. If audio from a capsule clips, its corresponding LED will turn red for 3 seconds. This is an indication that you may need to decrease capsule gain.

Mic Gain

Push the knob while in metering mode to enter Mic Gain mode as shown by the blue LED. Current Mic Gain will now be displayed and can be adjusted by rotating the knob. Mic Gain adjusts the gain of capsules before analog to digital conversion. Optimize mic gain so that the capsule signal is not clipping.

Turning the mic gain to the lowest position enables 'pad mode'. In this mode, the microphone ADC (analog to digital converter) clips at 131dB SPL — useful for recording loud sound sources.

Mix

Push the knob while in mic gain mode to enter mix mode as shown by the blue LED. Current mix balance will now be displayed and can be adjusted by rotating the knob. Rotating the knob to the left increases the amount of live capsule signal in the mix, while rotating the knob to the

right increases the amount of stereo host playback in the mix. This adjustment only affects the stereo audio signal sent to the headphone output.

HP Level

Push the knob while in mix mode to enter HP level mode as shown by the blue LED. Current headphone level will now be displayed and can be adjusted by rotating the knob.

While in HP mode, pushing the knob will cycle back to metering mode.

USB Audio Recording

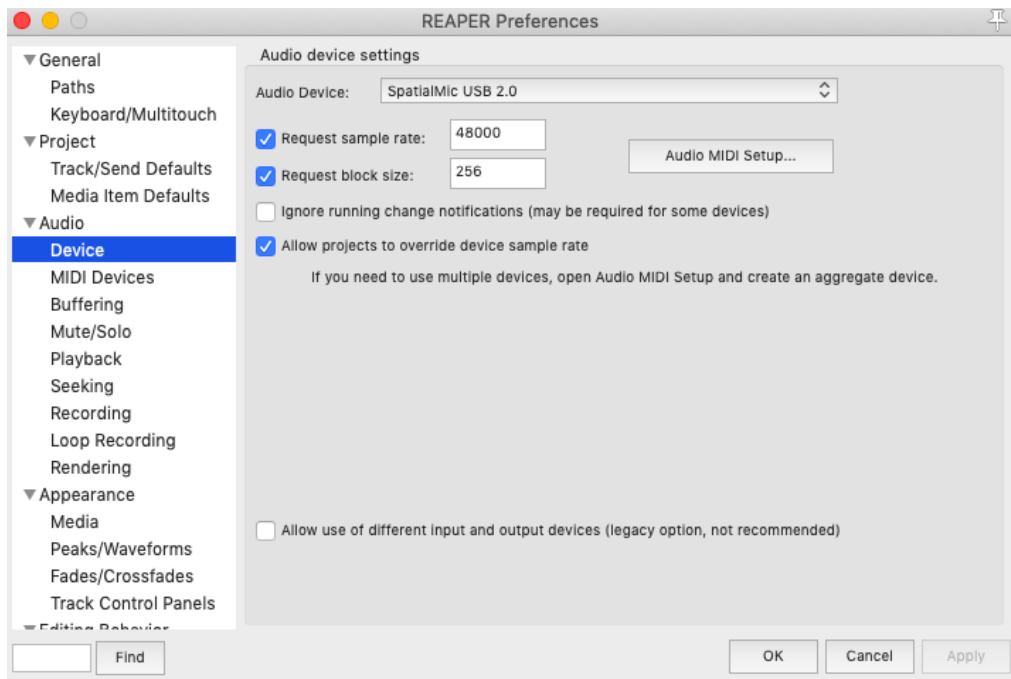
While various Digital Audio WorkStations (DAW) like [Reaper](#), [Pro Tools](#), [Logic Pro](#) or [Nuendo](#) may be used with Spatial Mic and Spatial Mic Converter plugin, we will focus on showing how to use Spatial Mic and the VST3 plugin version with Reaper on Mac OSX and Windows 10.

Further tutorials and documentation may be found in the Tutorials section of the Voyage Audio website.

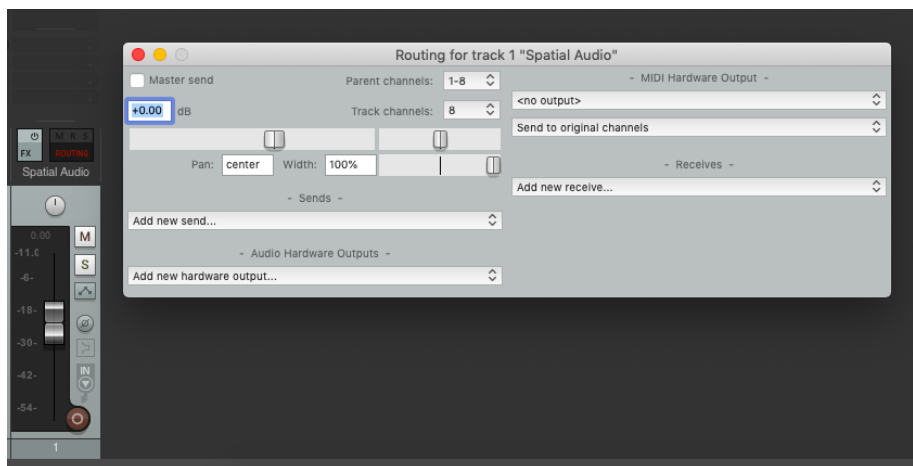
Mac OSX

1. Plug the free end of the USB cable to the USB port on your host device. Spatial Mic will go through an LED start-up sequence to indicate the device is receiving power. Your Mac OSX computer will automatically recognize the USB device.
2. Download and install the 64-bit version of [Reaper](#) for Mac OSX.
3. Open Reaper and create a new project.
4. Press **Command + ,** or open **Options ► Preferences...** and select the **Device tab**.

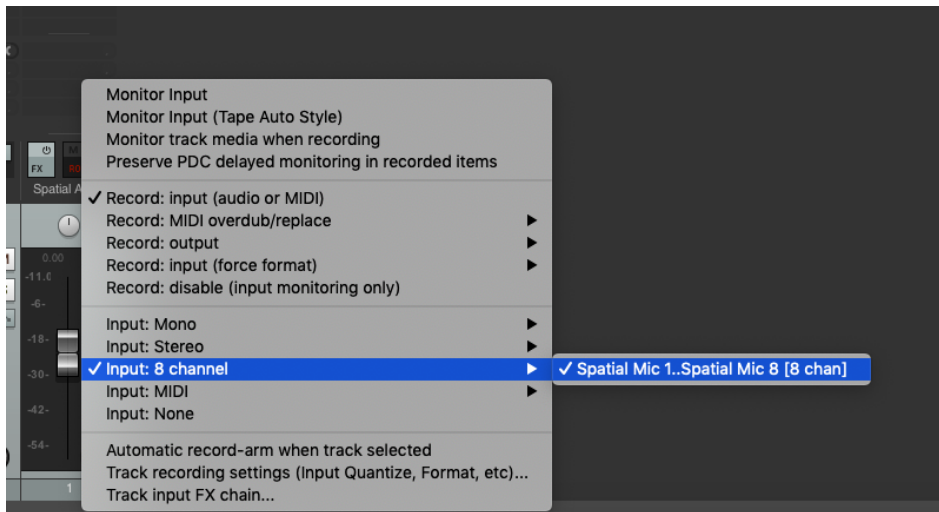
5. Select **SpatialMic USB 2.0** from the **Audio Device** dropdown as shown and press **Apply** in the bottom right hand corner.



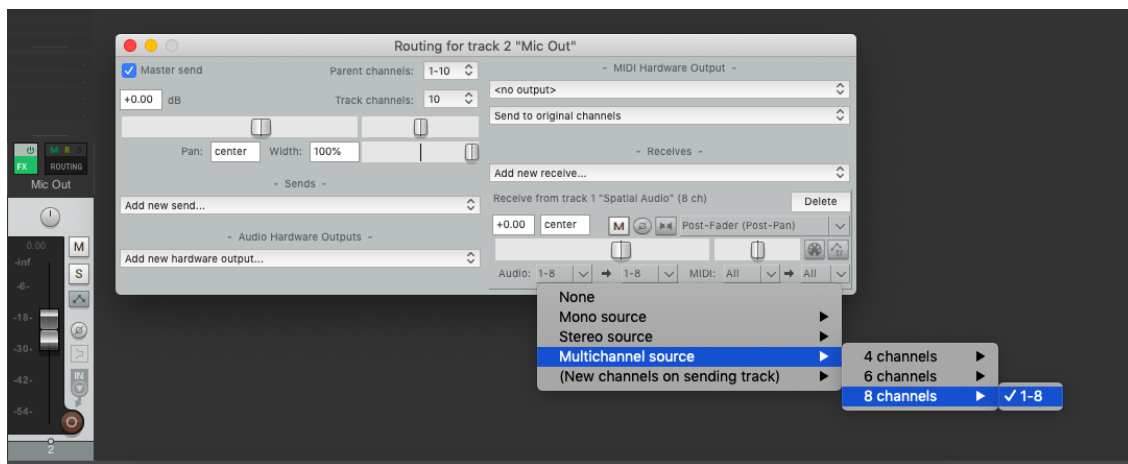
6. Press **Command + t** to create a new track and label it **Spatial Audio**.
7. Open the track **Routing** as shown, change **Track Channels** to 8 and de-select **Master Send**.



8. **Right click** on the **Record Arm/Disarm** button and select **Input:8 channel ▶ Spatial Mic 1...Spatial Mic 8[8 chan]** as shown.

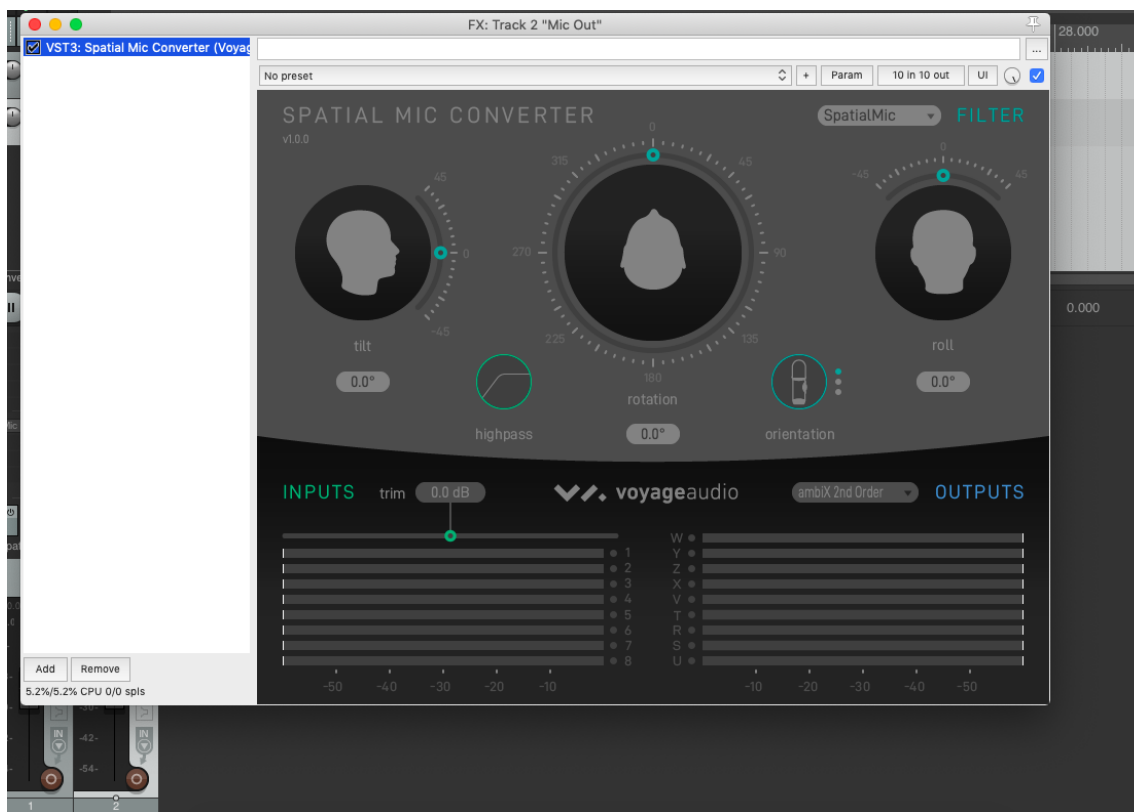


9. Enable recording by clicking the red **Record Arm/Disarm** button. The meter on the track should now be showing signal from Spatial Mic.
10. Create another track by pressing **Command + t** and label it **Mic Out**.
11. Open the track **Routing** as shown, change **Track Channels** to **10 (or up to 12 if 7.1.4 surround output is desired)** and select **1: Spatial Audio** from the **Receives** drop down as shown. For the receive, make sure 1-8 is selected under **Multichannel Source** from the **audio** dropdown menu as shown.

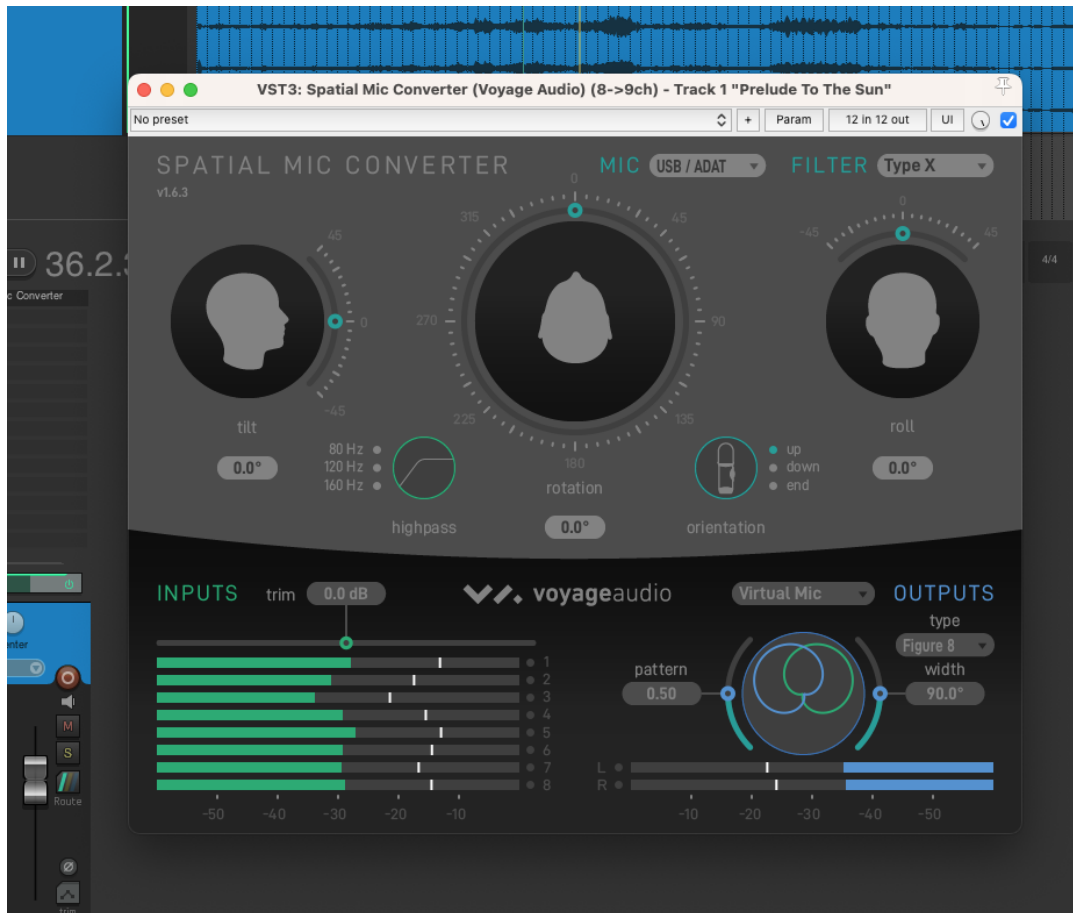


12. Click the **FX** button on the **Mic Out Track** and insert the **Spatial Mic Converter Plugin** (plugin installation and use is explained later in the user manual). Your screen should

now look similar to this:



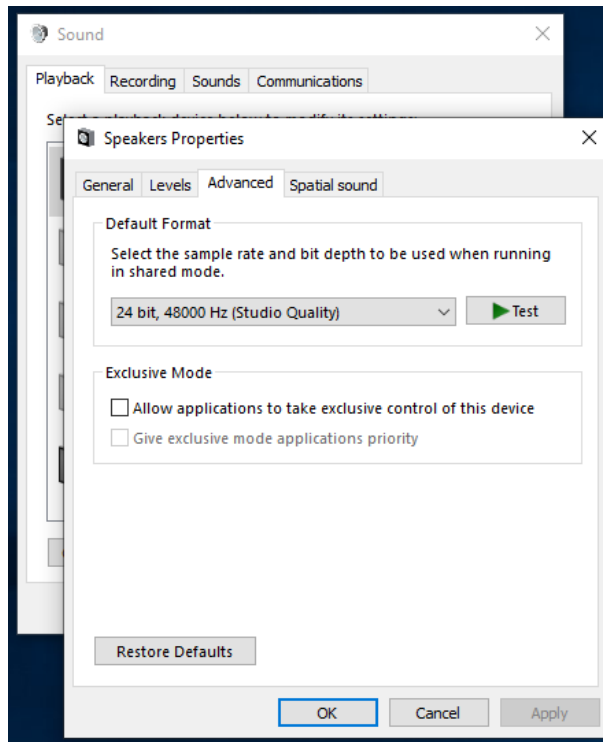
- Next, change the output to **Virtual Mic**. To listen to the mic playback in stereo setup the plugin as shown below.



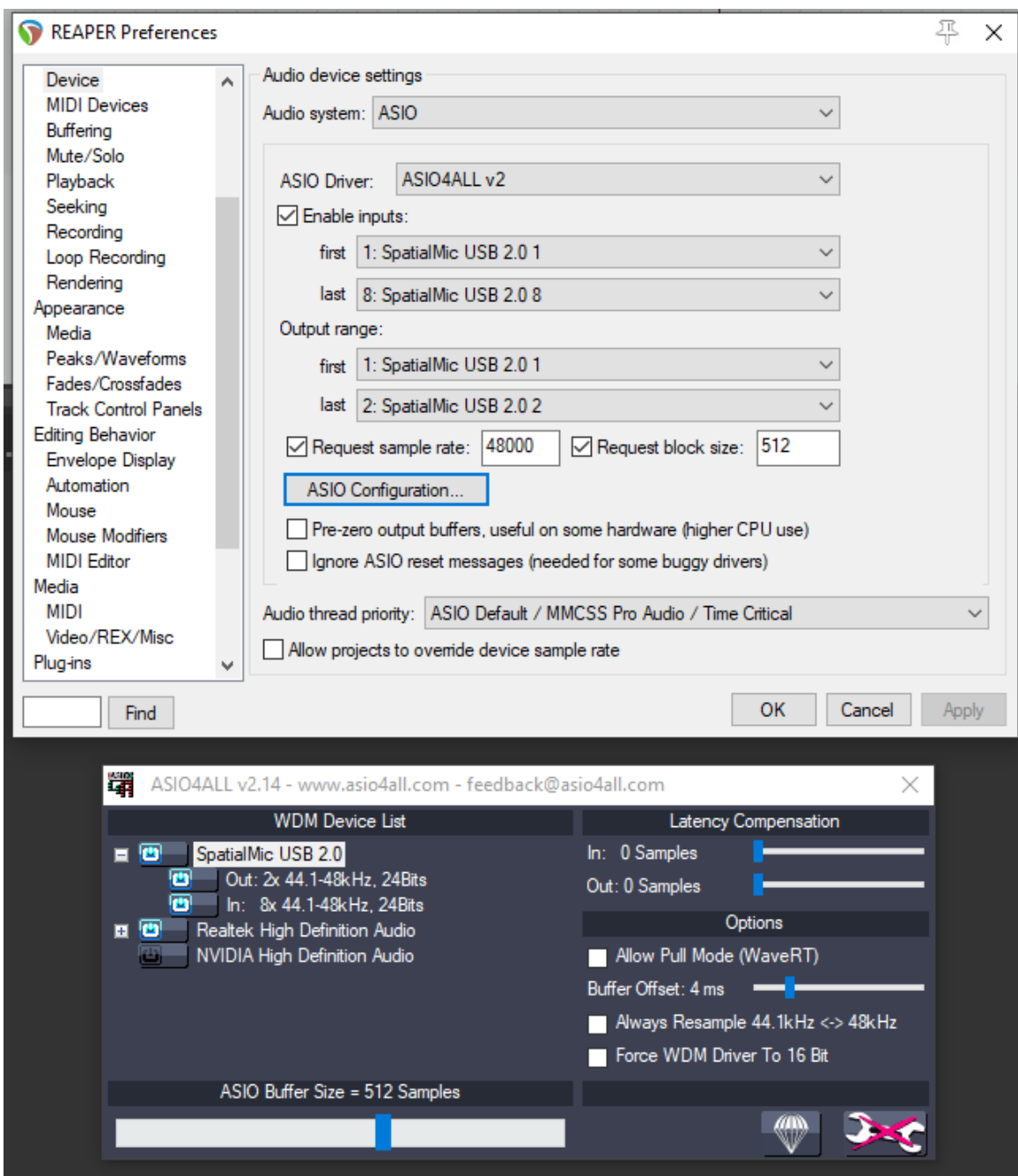
14. The output may be selected depending on the type of audio production. Please see the tutorials on the Voyage Audio website and YouTube channel.
15. You may now press the **record button** or press **command + r** to begin recording audio. Press the **space-bar** stop and press the space-bar again to playback.

Windows 10

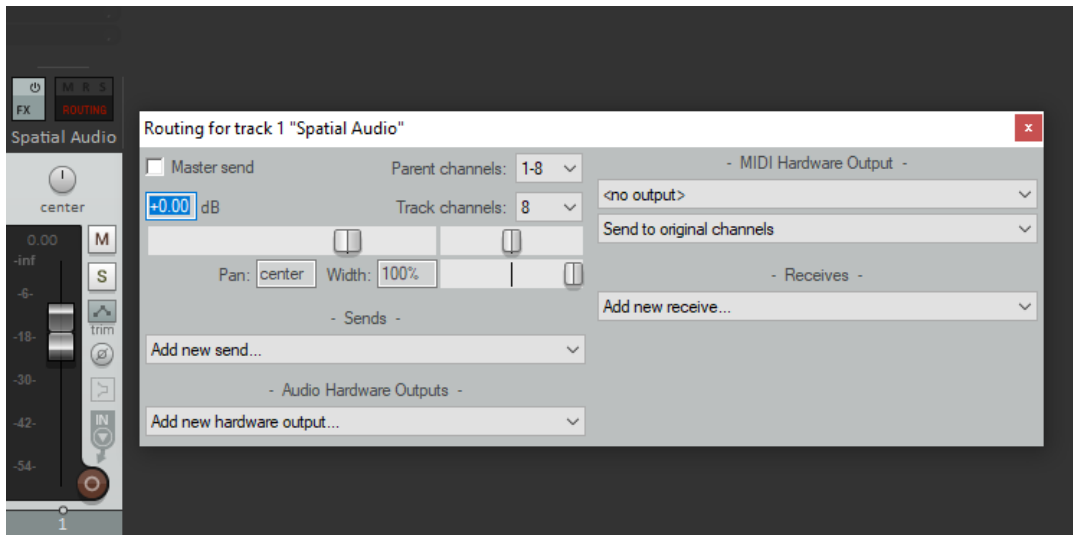
1. First, download ASIO4ALL drivers from <http://www.asio4all.org/> and run the Setup Wizard to install.
2. Plug the free end of the USB cable to the USB port on your host device. Spatial Mic will go through an LED start-up sequence to indicate the device is receiving power.
3. Windows may install audio drivers to recognise the device, which is fine, however for these instructions we will be using the ASIO4ALL drivers for recording.
4. In the Windows **Sound** control panel, double click on Spatial Mic in the **Playback** tab and make sure "Allow applications to take exclusive control of this device" is unchecked as shown. Do this for Spatial Mic in the **Recording** tab also.



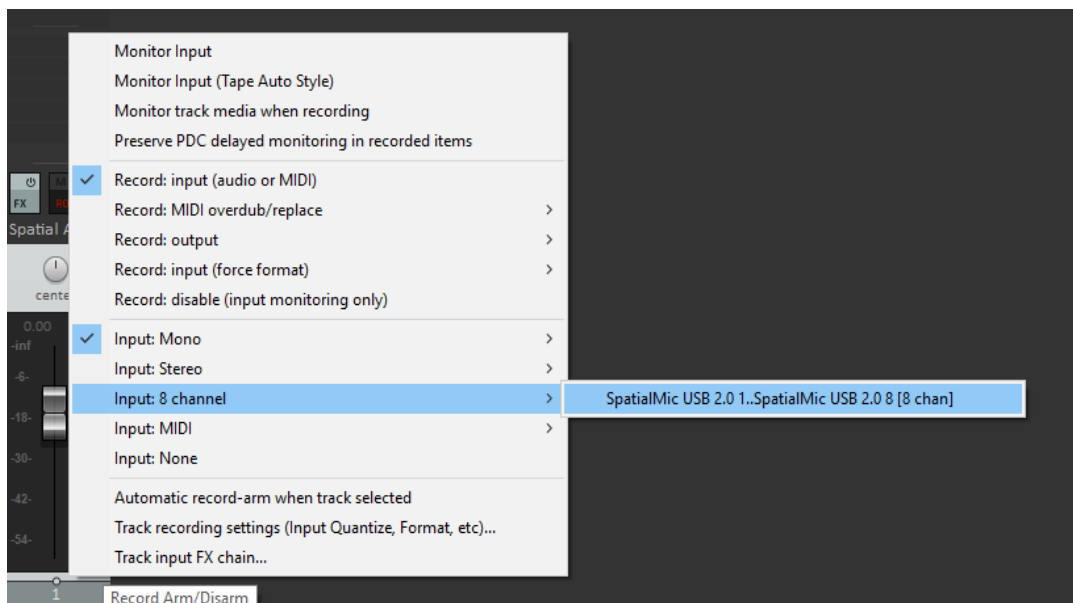
5. Download and install the 64-bit version of [Reaper](#) for Windows.
6. Open Reaper and create a new project.
7. Press **Ctrl + P** or open **Options ► Preferences...** and select the **Device tab**.
8. Select **ASIO** from the **Device** dropdown as shown and make sure ASIO4ALL is selected as the **ASIO Driver** and that the **first** and **last** inputs correspond to all 8 channels coming from Spatial Mic. A sample ASIO Configuration screen is also shown.



9. Press **Ctrl + t** to create a new track and label it **Spatial Audio**.
10. Open the track **Routing** as shown, change **Track Channels** to 8 and de-select **Master Send**.

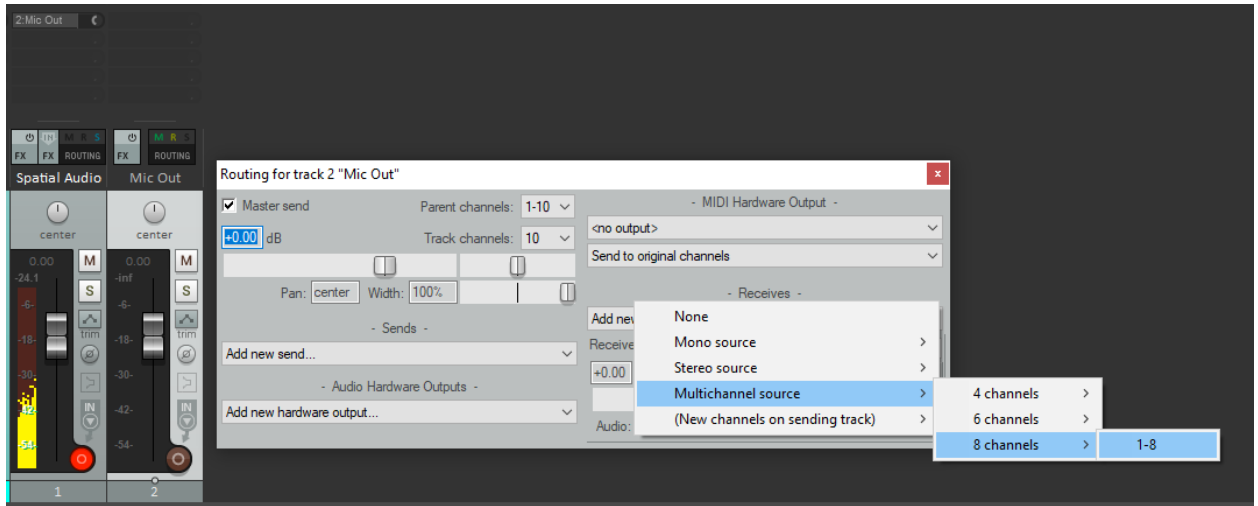


11. Right click on the **Record Arm/Disarm** button and select **Input:8 channel ► Spatial Mic 1...Spatial Mic 8[8 chan]** as shown.

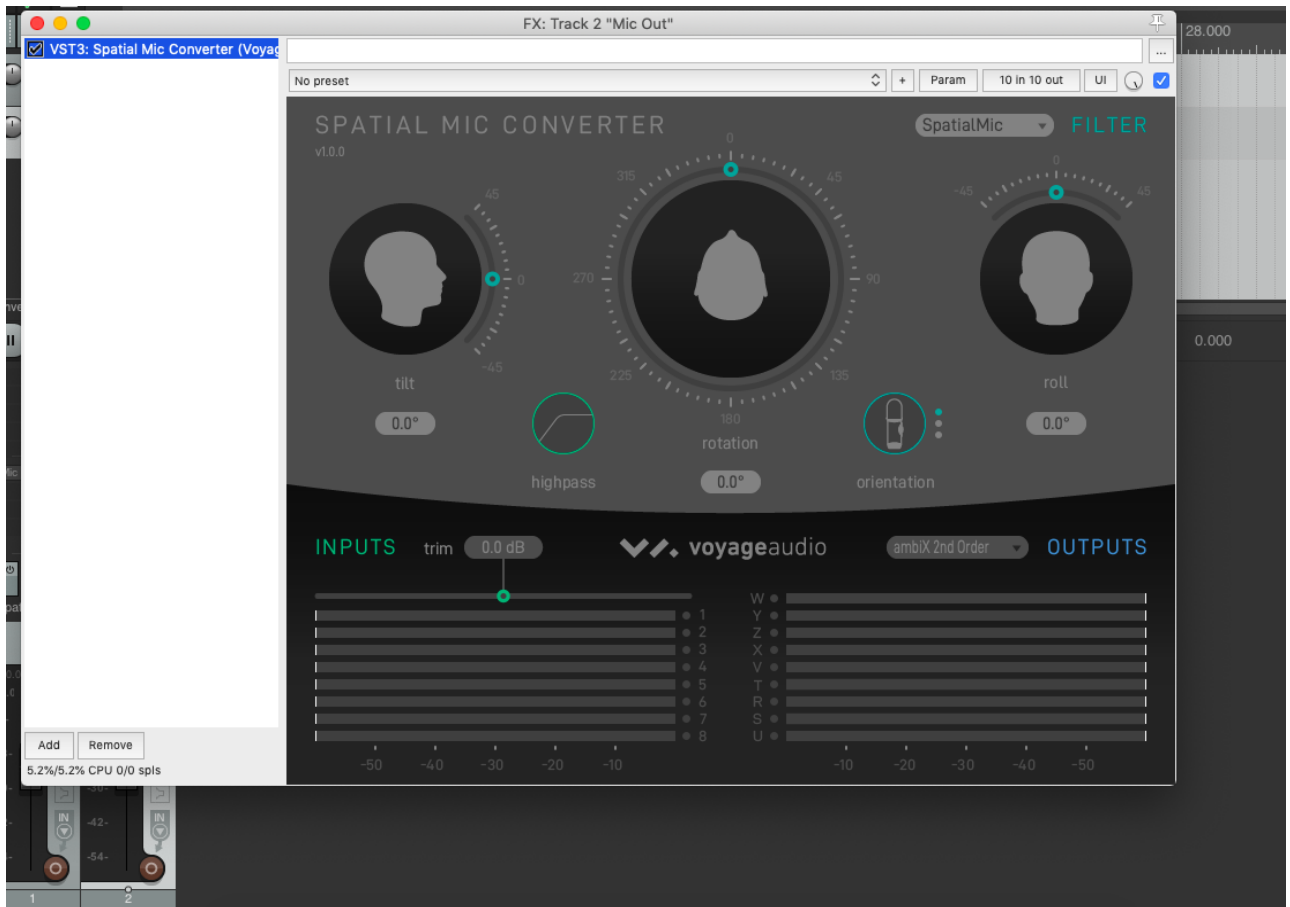


12. Enable recording by clicking the red **Record Arm/Disarm** button on the Spatial Audio track. The meter on the track should now be showing signal from Spatial Mic.
13. Create another track by pressing **Ctrl + t** and label it **Mic Out**.
14. Open the track **Routing** as shown, change **Track Channels** to **10** (or up to **12** if **7.1.4 surround output is desired**) and select **1: Spatial Audio** from the **Receives** drop down as shown. For the receive, make sure 1-8 is selected under **Multichannel Source**

from the **audio** dropdown menu as shown.



15. Click the **FX** button on the **Mic Out Track** and insert the **Spatial Mic Converter Plugin** (plugin installation and use is explained later in the user manual). Your screen should now look similar to this:



16. Next change the output to **Virtual Mic**. To listen to the mic playback in stereo setup the plugin as shown below.



17. The output may be selected depending on the type of audio production. Please see the tutorials on the Voyage Audio website and YouTube channel.
18. You may now press the **record button** or press **command + r** to begin recording audio. Press the **space-bar** stop and press the space-bar again to playback.

Mobile Devices

iOS

Spatial Mic has been tested to work with iOS by means of the [Lightning to USB 3 Camera Adapter](#). While several recording apps exist for iOS like [Auria](#) and [Audio Evolution Mobile](#), we will focus on using [multiTrack DAW](#).

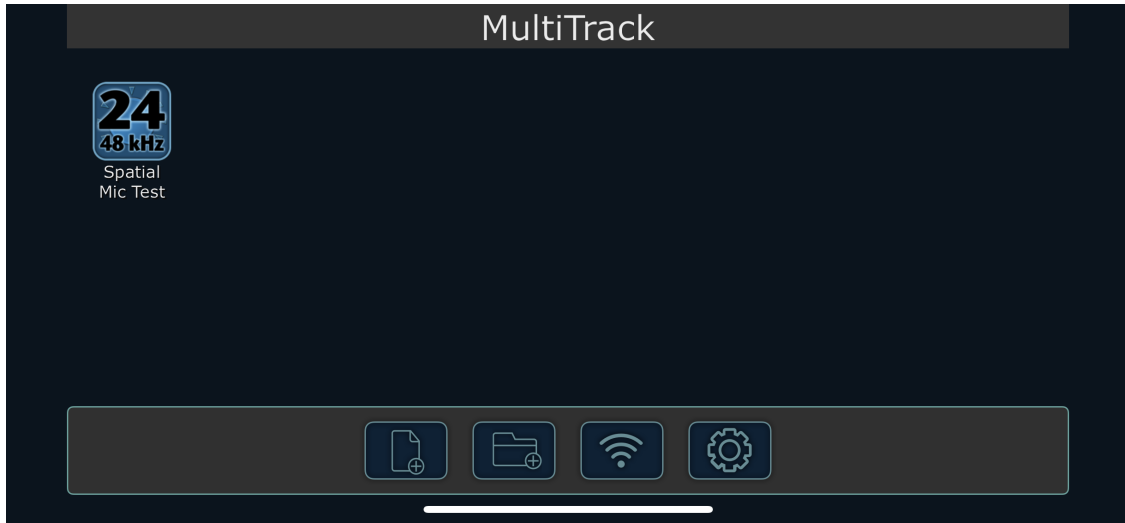
1. Plug the free end of the Lightning to USB 3 Camera Adapter into your iOS device.

2. Plug a USB battery or power adapter into the lightning receptacle on the Lightning to USB 3 Camera Adapter.
3. Connect Spatial Mic to Adapter using a USB C to USB A cable. If your battery has a power switch, turn it on. The completed setup should look similar to this:

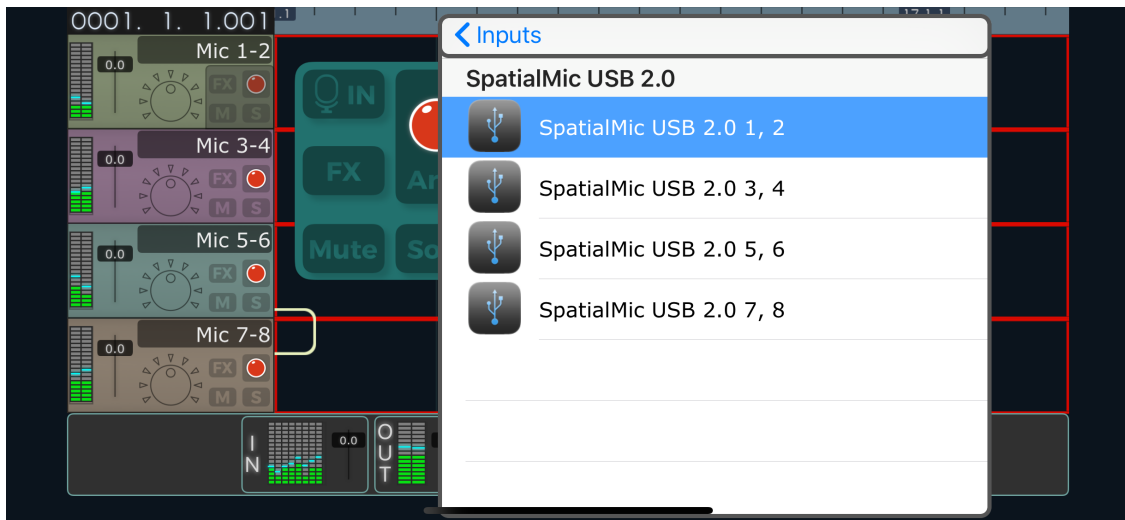


Note that the battery may also be plugged directly into Spatial Mic, however plugging the battery into the Adapter as shown will also charge the mobile device.

4. Launch multiTrack DAW app and create a new Song as shown.



5. Open the song and create 4 stereo tracks. Set the input to each track so that track one receives Spatial Mic 1-2, track two receives Spatial Mic 3-4 and so on. Name the tracks for easy reference later.



- MultiTrack DAW should now be ready to record as shown:

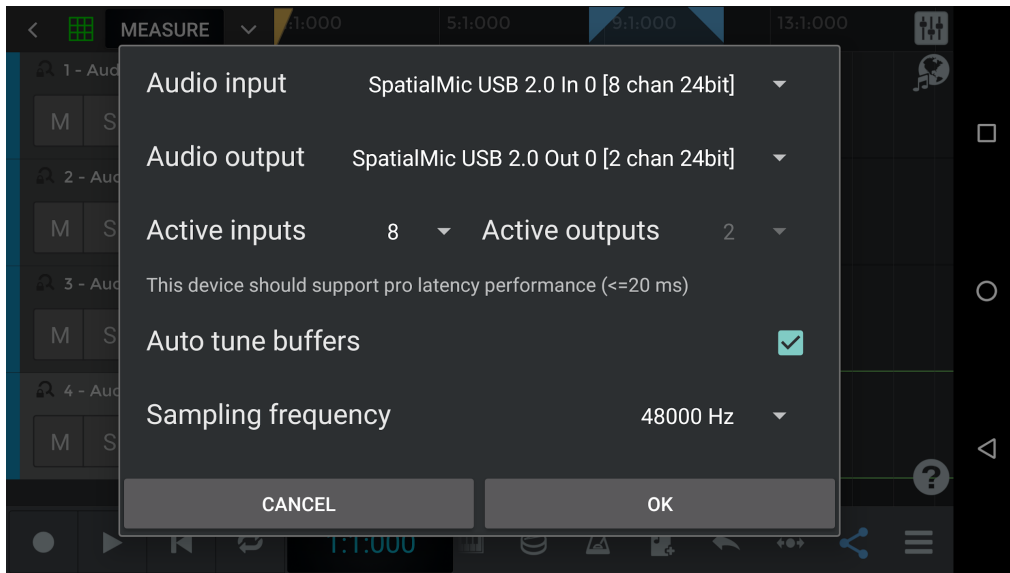


- When you are finished recording, close the song and export the files according to the multiTrack DAW instructions.
- Import the files into a program like Reaper, and route the audio into Spatial Mic Converter plugin. Take care to ensure audio track routing is correct. For example, track one, exported from multiTrack DAW, should be routed to channel 1 and 2 of the Spatial Mic Converter plugin and so on for the other tracks.

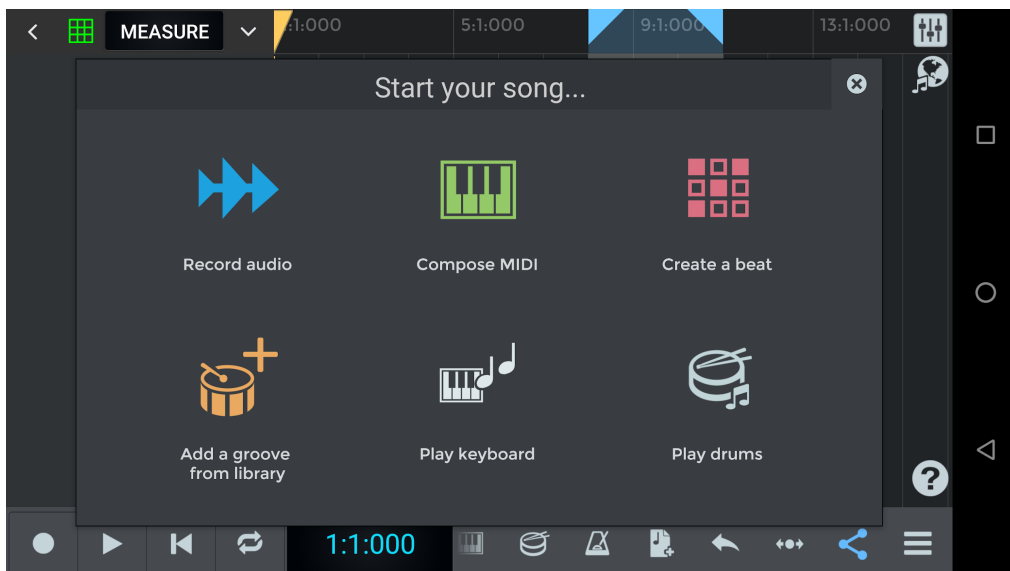
Android

Spatial Mic has been tested to work with Android using the USB-C to C cable as well as a USB on-the-go cable if your mobile device has a micro-USB port. While several recording apps exist for Android like [Audio Evolution Mobile](#), we will focus on using [N-Track](#).

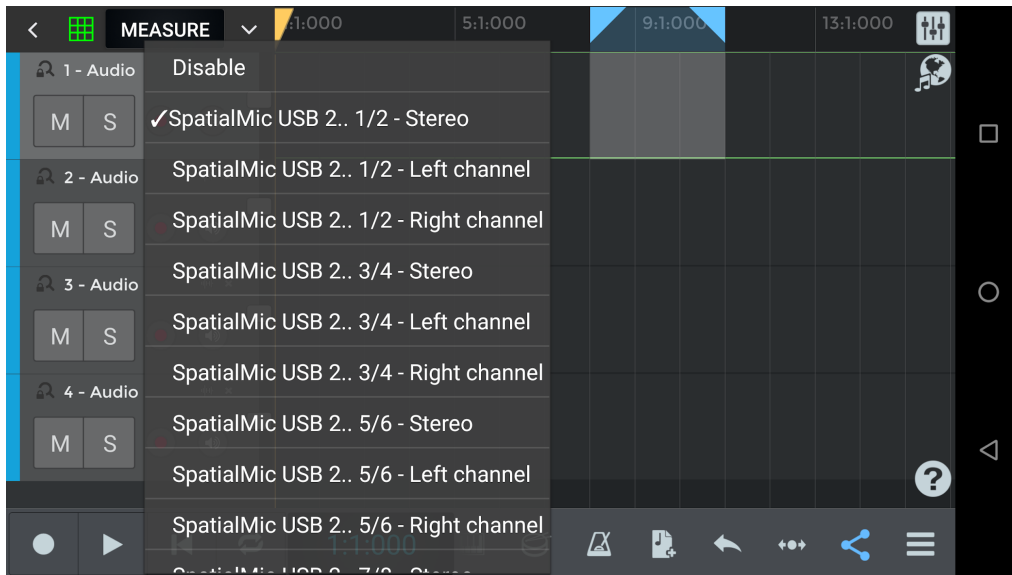
- Plug the free end of the USB Cable into your Android device.
- To save battery power on your device plug a USB battery or power adapter into the +5V micro-USB port on the bottom of Spatial Mic.
- Launch n-Track Studio Music DAW app and select the driver you wish to use. We suggest trying both the n-Track USB driver and the Android USB driver to see which performs best with your device.
- Android system will ask for permission to access the USB device. Select OK
- An audio device window will automatically open as shown below. Select Spatial Mic for audio input and audio output in the drop down menus. Change the number of Active inputs to 8, change the Sampling frequency to the desired rate and then press OK.



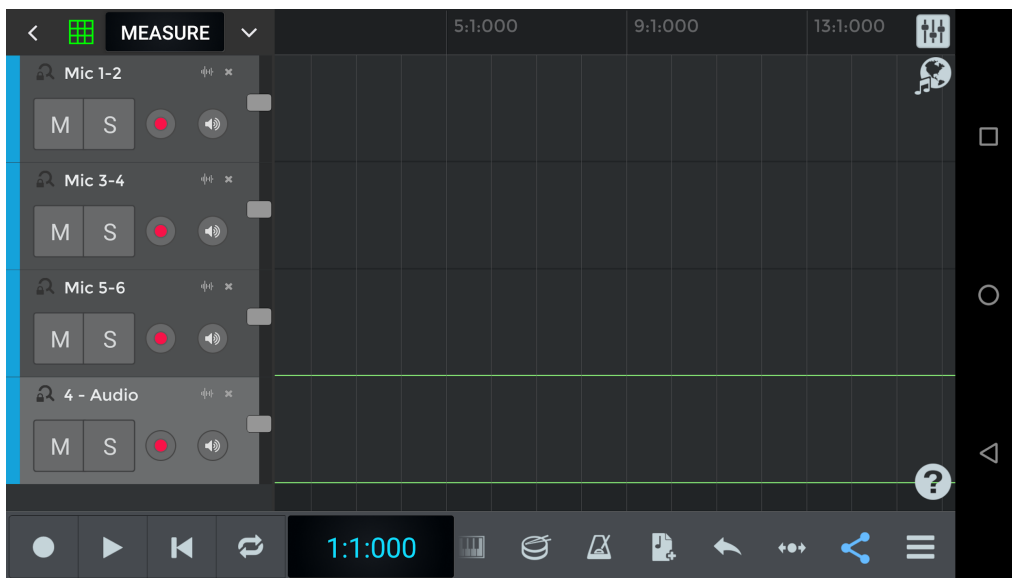
6. Select the menu icon in the lower right corner and create a new song. Choose Record audio for the session type.



7. Create 4 Audio tracks and then press the round record icon on the first track to select the audio input. Set the input to each track so that track one receives Spatial Mic 1/2-Stereo, Track Two receives Spatial Mic 3/4-Stereo and so on. Name the tracks for easy reference later.



8. n-Track Studio Music DAW should now be setup and ready to record as shown:



9. When you are finished recording, save the song and export the files according to the n-Track Studio Music DAW instructions.
10. Import the files into a program like Reaper, and route the audio into Spatial Mic Converter plugin. Take care to ensure audio track routing is correct. For example, track one, exported from multiTrack DAW, should be routed to channel 1 and 2 of the Spatial Mic Converter plugin and so on for the other tracks.

USB Notes & Troubleshooting:

If playback errors occur:

1. Try raising the 'Request Block Size' under the Device tab and ASIO4ALL control panel to higher values like 1024. Make sure Spatial Mic is selected on the left hand side. (Windows only)
2. Try raising 'Buffer Offset' on the ASIO4ALL control panel. Make sure Spatial Mic is selected on the left hand side while doing this. (Windows only)
3. Bypass any USB hubs and try plugging Spatial Mic into a different USB port. For example, sometimes USB ports on the front case of a computer are actually a hub.
4. Ensure the mic is receiving adequate power.
5. Ensure that system wide sound correction or other audio effects are deactivated.
6. Ensure 'Spatial Mic' is enabled in ASIO4ALL settings and any other hardware devices are disabled. Do this by clicking on the device in the ASIO4ALL settings panel so that it is illuminated blue. (Windows only)

Using Your Microphone

Positioning

The knob on Spatial Mic indicates the front or 'zero' degree position. This corresponds to the direction the 'head' image is facing when Spatial Mic Converter Plugin is in its default state. When recording audio for 360 video, you will probably want to orient the front of the microphone to correspond to the front of the camera (normal orientation), but please note that the Spatial Mic Converter plugin 'orientation' button can change the orientation of the mic after recording to be 'end-fire' or 'inverted'.

As with any microphone, experimentation is the key to great sound capture. If recording audio for video, a 'slate' tone or simple hand clap may help to time align the sound with video in post-production.

Recording Tips

- If the LEDs turn red (Capsule or Monitor Metering Modes) your recording may clip. In this case, turn down mic gain until the signal is below clipping. Likewise, observe your DAW input meters and turn down the mic gain if clipping occurs.
- You may wish to mute the live sound from the capsules while playing back audio. To do this, push and hold the knob until the mode LEDs turn red.
- When recording to a mobile device, it is recommended to put your device in Airplane mode for uninterrupted recording. Notifications, along with vibrations and ring-tones may impede the device's ability to make clear recordings.

- Make sure you have plenty of storage space on your mobile device or your computer hard drive before recording. One minute of 8-channel audio from the Spatial mic at 48kHz uses about 66 MB. Approximate storage space required is as follows:
 - 24 bit / 96 kHz
 - 1 min = 131 MB
 - 5 mins = 660 MB
 - 30 mins = 3955 MB (4GB)
 - 24 bit / 88.2 kHz
 - 1 min = 121 MB
 - 5 mins = 606 MB
 - 30 mins = 3633 MB (3.6GB)
 - 24 bit / 48 kHz
 - 1 min = 66 MB
 - 5 mins = 330 MB
 - 30 mins = 1977 MB (1.9GB)
 - 24 bit / 44.1 kHz
 - 1 min = 61 MB
 - 5 mins = 302 MB
 - 30 mins = 1816 MB (1.8GB)

Care & Maintenance

- Spatial Mic features robust mechanical, however you should always try to handle the microphone carefully and avoid dropping or sudden shocks.
- Clean microphone body with a clean, dry cloth. With the headbasket detached, you may clean both sides with a slightly damp cloth and re-attach when dry.
- Keep working distance at least 6 inches from the microphone.
- Avoid leaving Spatial Mic in extreme temperatures, humidity or direct sunlight for extended periods of time.
- Use the included windscreens to protect the capsule array from wind and moisture as needed.
- Do not over-bend cables as this may cause them to break or become intermittent.
- Make sure jacks, especially the ADAT lightpipe stay clean and free of dust particles.
- Spatial Mic is factory calibrated before shipping.

Spatial Mic Converter



The Spatial Mic Converter plugin and full manual can be downloaded from the [Voyage Audio Website](#).

Overview

The Spatial Mic Converter plugin transforms the raw audio signals from Spatial Mic to a format useful for audio production. To accomplish this, Spatial Mic Converter uses an internal 64-channel filter matrix and measurements from an anechoic chamber.

Spatial Mic Converter offers the capability to change the microphone's aim at the point in space where the audio was recorded. This is useful when aligning audio position with 360 video, aiming the mic at specific sounds that should be in front of the listener, or used in combination

with the virtual mic output stage to focus directional polar patterns at different parts of the soundfield.

The audio output from Spatial Mic Converter can be first or second order ambisonics in AmbiX or Fuma, mono or stereo virtual mics, or up to 7.1.4 surround.

The ambisonic output can be sent to a variety of plugins from manufacturers like [SSA](#), [Blue Ripple Sound](#), [IEM](#), [SPARTA](#) and many others. Mono or stereo virtual mic outputs can be used with standard audio production plugins. The surround outputs can be used for sound bed tracks in Dolby Atmos[®] sessions or routed directly to the surround bus of choice.

Spatial Mic Control



Overview

The Spatial Mic Control app provides remote manipulation of various hardware parameters on Spatial Mic. Spatial Mic Control communicates with the microphone through the same USB cable used to supply power and stream audio data. Spatial Mic Control replicates the hardware controls found on Spatial Mic itself and adds additional functionality.

Usage

Simply launch Spatial Mic Control when Spatial Mic is plugged into an available USB port on your computer.

Controls & Interface

Mic Gain

Adjusts the gain of capsules before analog to digital conversion. Optimize mic gain so that the capsule signal is not clipping. Changes made to this control will be reflected in Mic Gain mode on the microphone itself.

Mix

Rotating the control to the left increases the amount of live microphone signal in the mix, while rotating the knob to the right increases the amount of stereo host playback in the mix. This adjustment only affects the stereo audio signal sent to the headphone output. Changes made to this control will be reflected in Mix mode on the microphone itself.

Headphone Level

Adjusts level of headphone signal present on microphone HP output. Changes made to this control will be reflected in HP mode on the microphone itself.

Mute

Mutes the signal coming from microphone capsules. This button functions the same as long pressing the knob on the front of Spatial Mic.

Meter

Changes what is shown on the Spatial Mic LED display (persists when mic is power cycled). When powering up Spatial Mic, the LED display will show a turn-on sequence and then display the last metering mode selected with Spatial Mic Control. The metering modes that may be selected are:

- **Off** - no metering or LEDs on
- **Monitor** - LEDs display stereo L-R mix of Live binaural monitoring and host device playback.
- **Capsule** (Factory Default) - LEDs display signal level for the 8 capsules. If audio from a capsule clips, its corresponding LED will turn red for 3 seconds. This is an indication that you may need to decrease capsule gain.

Installation

The installer for the Spatial Mic Control app can be downloaded at <https://voyage.audio/downloads/>

1. Unzip the downloaded file and run the installation program.
2. After the installation is complete simply run the Spatial Mic Control app when Spatial Mic is connected to the computer via USB to gain access to the microphone's settings.
3. If required, to uninstall, manually delete the files from your computer.

Specifications

- Electrical:
 - 8 Channels Streaming to USB 2.0 Audio Host via USB-C Connector / 2 Channels Streaming Playback from Audio Host
 - 8 Channels ADAT Lightpipe Digital Output
 - USB Streaming and ADAT may be used independently or concurrently
 - Sample Rates USB: 44.1kHz, 48kHz, 88.2kHz and 96kHz
 - Sample Rates ADAT: 44.1kHz and 48kHz
 - ADC 110dB SNR per channel, DAC 108dB SNR
 - Bit Depth: 16/24-bit
 - ADC clipping in pad mode: 131dB SPL
 - USB bus powered via USB-C or external 5v source via micro-USB
 - Headphone output: 130mW into 16 ohms via 3.5mm TRS jack
 - Live binaural monitoring using [Google Resonance](#) HRTFs (44.1kHz and 48kHz) and live Mid-Side monitoring (88.2kHz and 96kHz)
 - Spatial Mic Converter plugin DSP filter type: 64-element output filter matrix
 - Individual calibration stored in each Mic.
- Capsule & Array:
 - 14mm Prepolarized Condenser
 - SNR: > 72dB-A
 - Frequency Response: 20Hz to 20kHz
 - Max SPL for THD<3%: 120dB @1kHz
 - Array: 8 transducers¹
 - Array Ordering: Looking at Spatial Mic from the front, as indicated by the knob, Capsule 1 is on the lower right (Roman numeral 'I'). Capsule 5 is on the top ring of the capsule array and inline with microphone knob. The bottom ring contains capsule 1-4 and the top ring contains capsule 5-8.
- Mechanical:
 - Construction: Aluminum & Nylon
 - Spatial Mic Dimensions: Height: 6.75" Diameter: 2.125"
 - Weight (Mic only): 0.54 lbs
- Included Accessories:
 - USB C to C and USB C to A cable, 3 meter, black nylon braided
 - 1/4-20 to 5/8" mini swivel ball hard-mount
 - Foam windscreen
 - Quick-start guide

¹ [Based on geometry presented at the 133 AES Convention](#)

- For Download: Spatial Mic Converter installer for OSX & Windows including: VST3[®] plugin (Mac OSX & Windows), AU (Audio Unit for Mac OSX) and AAX (Windows & Mac OSX)
- For Download: Spatial Mic Control standalone app (Mac OSX & Windows)
- Optional Accessories:
 - Rycote InVision shockmount

Warranty

Voyage Audio guarantees all products against manufacturing defects within one (1) year from the date of purchase. The warranty only applies to Voyage Audio products purchased from Voyage Audio directly or authorized dealers. Warranty claims require a copy of the original proof of purchase from Voyage Audio or authorized dealer. If a product requires service during this time period, please contact Voyage Audio via our email address to discuss & troubleshoot the problem. Voyage Audio will not accept repair or returned items for any reason without prior approval. Please contact Voyage Audio for a return authorization number. The RA number must be clearly marked on the returned package. If needed, we will repair or replace the product at no charge to you. At our discretion, this may include either repair with new or refurbished parts, replacement with a new or refurbished product or a refund for the purchase price, less shipping. Products that have been replaced or repaired are covered under the remaining warranty for the original product. or sixty (60) days from the date of repair or replacement, whichever is longer.

Please be advised that this warranty does not cover damage caused by accident, acts of nature, abuse, misuse or failure to use the product as instructed or implied by the user manual. In addition, this warranty does not cover any alteration or repair by anyone other than Voyage Audio or an authorized third-party. The warranty does not cover scratches, dents or other cosmetic damage, nor does it cover damage to other accessories or gear used in conjunction with Voyage Audio products. Due to the nature of audio recording and production, Voyage Audio cannot guarantee product operation with all end user equipment. Voyage Audio cannot be held liable to you or anyone else for any loss of use, data, profits or any damages whatsoever.

This warranty is non-transferable and applies only to the original owner.

If you would like calibration or service performed on a product that is not covered under warranty, please contact Voyage Audio.

Voyage Audio is not responsible for shipping charges related to warranty, calibration or service.

Certifications

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Industry Canada ICES-003 Compliance Label: CAN ICES-3 (B)/NMB-3(B)

Note: Testing is based on the use of supplied and recommended cable types. The use of other than shielded (screened) cable types may degrade EMC performance.

Support & Contact

Website:

<https://voyage.audio>

E-mail:

info@voyage.audio

Address:

Voyage Audio LLC.
3555 Rosecrans St. Suite #114-491
San Diego, CA 92110 USA

Third Party Tools & Notices



Google Resonance Audio / York University SADIE BINAURAL MEASUREMENTS - License

This product may use portions of the following libraries subject to the accompanying licenses:

Copyright (c) 2016, Google Inc.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License.

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf

of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. **Grant of Copyright License.** Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. **Grant of Patent License.** Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. **Redistribution.** You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - a. You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - b. You must cause any modified files to carry prominent notices stating that You changed the files; and
 - c. You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - d. If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative

Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. **Submission of Contributions.** Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. **Trademarks.** This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. **Disclaimer of Warranty.** Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. **Limitation of Liability.** In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. **Accepting Warranty or Additional Liability.** While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

Intel MKL Library - Intel Simplified Software License (Version April 2018)

Copyright (c) 2018 Intel Corporation.

Use and Redistribution. You may use and redistribute the software (the “Software”), without modification, provided the following conditions are met:

* Redistributions must reproduce the above copyright notice and the following terms of use in the Software and in the documentation and/or other materials provided with the distribution.

* Neither the name of Intel nor the names of its suppliers may be used to endorse or promote products derived from this Software without specific prior written permission.

* No reverse engineering, decompilation, or disassembly of this Software is permitted.

Limited patent license. Intel grants you a world-wide, royalty-free, non-exclusive license under patents it now or hereafter owns or controls to make, have made, use, import, offer to sell and sell (“Utilize”) this Software, but solely to the extent that any such patent is necessary to Utilize the Software alone. The patent license shall not apply to any combinations which include this software. No hardware per se is licensed hereunder.

Third party and other Intel programs. “Third Party Programs” are the files listed in the “third-party-programs.txt” text file that is included with the Software and may include Intel programs under separate license terms. Third Party Programs, even if included with the distribution of the Materials, are governed by separate license terms and those license terms solely govern your use of those programs.

DISCLAIMER. THIS SOFTWARE IS PROVIDED “AS IS” AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF

MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT ARE DISCLAIMED. THIS SOFTWARE IS NOT INTENDED FOR USE IN SYSTEMS OR APPLICATIONS WHERE FAILURE OF THE SOFTWARE MAY CAUSE PERSONAL INJURY OR DEATH AND YOU AGREE THAT YOU ARE FULLY RESPONSIBLE FOR ANY CLAIMS, COSTS, DAMAGES, EXPENSES, AND ATTORNEYS' FEES ARISING OUT OF ANY SUCH USE, EVEN IF ANY CLAIM ALLEGES THAT INTEL WAS NEGLIGENT REGARDING THE DESIGN OR MANUFACTURE OF THE MATERIALS.

LIMITATION OF LIABILITY. IN NO EVENT WILL INTEL BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. YOU AGREE TO INDEMNIFY AND HOLD INTEL HARMLESS AGAINST ANY CLAIMS AND EXPENSES RESULTING FROM YOUR USE OR UNAUTHORIZED USE OF THE SOFTWARE.

No support. Intel may make changes to the Software, at any time without notice, and is not obligated to support, update or provide training for the Software.

Termination. Intel may terminate your right to use the Software in the event of your breach of this Agreement and you fail to cure the breach within a reasonable period of time.

Feedback. Should you provide Intel with comments, modifications, corrections, enhancements or other input ("Feedback") related to the Software Intel will be free to use, disclose, reproduce, license or otherwise distribute or exploit the Feedback in its sole discretion without any obligations or restrictions of any kind, including without limitation, intellectual property rights or licensing obligations.

Compliance with laws. You agree to comply with all relevant laws and regulations governing your use, transfer, import or export (or prohibition thereof) of the Software.

Governing law. All disputes will be governed by the laws of the United States of America and the State of Delaware without reference to conflict of law principles and subject to the exclusive jurisdiction of the state or federal courts sitting in the State of Delaware, and each party agrees that it submits to the personal jurisdiction and venue of those courts and waives any objections. The United Nations Convention on Contracts for the International Sale of Goods (1980) is specifically excluded and will not apply to the Software.

*Other names and brands may be claimed as the property of others.

HIDAPI - Multi-Platform library for communication with HID devices.

Copyright 2009, Alan Ott, Signal 11 Software. All Rights Reserved.

This software may be used by anyone for any reason so long as the copyright notice in the source files remains intact.

JUCE HID Wrapper License

MIT License

Copyright (c) 2018 Chris Penny

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.