

“Have you ever heard a blindfolded octopus un-
wrap a cellophane-covered bathtub?”
~ The Phantom Tollbooth

Spatial Audio

Using the ZOOM H2N recorder

[zoom.com](https://zoom.us)



College of Communications

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Tips & Tricks

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NOTE: This tutorial was written for the Mac OS.

Introduction

Think about how you hear in the real world. Your ears and brain process sound so you can understand where it is coming from.

A loud sound behind you, and you turn around. And then the sound is in front of you. It all seems obvious, until you try and recreate that in the virtual world.

Broadly, **spatial audio** is any sound that is not mono - any sound that has a sense of space or direction. But for our purposes we will look specifically at **Ambisonic sound**.

Ambisonic Audio is spatial audio that is experienced in 360 degrees AND is responsive to your movement. As you turn, the sound turns with you. Sound that was coming from the left, is suddenly in front of you.

This dramatically changes the experience of viewing 360 video, and your ability as a creator to guide and influence the experience.

This **tutorial** is designed to quickly get you familiar with the key features of creating Ambisonic Sound using the Zoom H2N audio recorder. It is NOT designed to detail every single feature of the device or process.

It is current as of **August 2018**

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- If you want to use the recorder for other purposes, take a read through the manual.
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We'll be using the ZOOM H2N audio recorder. This inexpensive hand-held recorder can record **ambisonic sound**

When the audio is properly encoded and added to 360 video in the editing process it is possible to create fully spatial responsive audio.

RECORDER BASICS

The Zoom recorder ships with a 2GB micro SD card and adaptor. The recorder uses standard SD cards. A larger capacity card will allow for longer recording times.

The recorder is fully featured and can be used in a variety of modes for different applications. You can for example plug in external microphones, and record in a variety of formats.

We will only be looking at how to use the recorder for the specific purpose of recording **ambisonic audio** for **360 VR videos**.

Batteries

The recorder uses two AA batteries. Check their level before starting an assignment.

The back cover of the recorder slides off for access to the battery compartment.



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SD CARD

The SD card slot is on the bottom of the recorder.

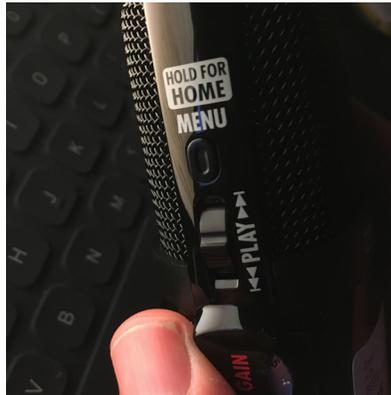
Always insert SD cards gently, making sure they are facing the right way. Don't force them.

THE BUILT IN MEMORY WON'T WORK WITH SPATIAL AUDIO (AND IS LIMITED TO ONE MINUTE)

YOU MUST HAVE AN SD CARD IN PLACE TO RECORD

ALWAYS erase/format your card before using it. This rule applies to all electronic devices.

Formatting the card



Press the menu button

Use the Play switch to toggle up or down to navigate to SD CARD

Press in on the Play switch to select the SD CARD

Use the Play switch to navigate to FORMAT

Press on the Play switch, select YES and then press Play again

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SET UP THE RECORDER FOR SPATIAL AUDIO

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- Press MENU on the side of the camera.
- Use the PLAY switch below the MENU button to navigate up and down and press in on the PLAY button to select.
- Scroll to Record (REC) and Select
- Scroll to Spatial Audio and Select
- Turn Spatial Audio on and Select

[YouTube Tutorial on setting up the recorder](#)

Set the recorder mode to **4 Channels** by turning the dial on top of the recorder:



RECORDING LEVELS

If the sound will be consistent, set the levels manually. During an interview for example, or another situation that is controlled.

If you are unsure, since you can't stand with the device to make adjustments, set

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the recording levels to automatic.

To set MANUAL Recording turn the AUTO GAIN Off

Press Menu
Scroll to INPUT and Select
Scroll to AUTO GAIN and Select
Select OFF

To use Auto Gain

Select the appropriate setting for the audio environment
Concert - concerts and other loud sound sources
Solo - acoustic guitars and other solo performances
Meeting - Meetings and other quiet sources

RECORDING FORMATS

- Set the recorder to WAV 48kHz/16 Bit
- In Spatial Audio only WAV format is available
- 48kHz is compatible with the audio recorded by the camera
- 16 Bit gives good quality without creating the larger files of 24 Bit audio.
- Select Menu
- Scroll to Record (REC) and Select
- Scroll to REC FORMAT and Select
- Scroll to WAV 48kHz/16 Bit and select

RECORDING

Place the recorder as close as possible to the 360 camera.
Directly underneath will keep it mostly hidden from view.

Orient the front of the recorder in the same direction as the front of the camera.

Start both camera and recorder and clap three times, moving around the camera. This will help Premiere synch the recorder audio with the video when you edit.

Double check both camera and recorder are recording and then get out of sight.