AMBEO VR Mic in a nutshell

MESSAGE

The full Virtual Experience eliminating the boundaries between playback and reality.

TARGET GROUP

Virtual reality content creators and producers

UNIQUE SELLING PROPOSITION:

The AMBEO VR Mic is an Ambisonic microphone purely designed with VR content producers/creators, to capture 360-degree spatial audio from a single point of audio recording to match the VR spherical video. In conveys spirit of any location enabling the listener to be immersed as if they were there.

PRODUCT DESCRIPTION IN 50 WORDS:

The AMBEO VR mic is an Ambisonic microphone fitted with four matched capsules in a tetrahedral arrangement. This special design allows you to capture the sound that surrounds the mic from a single point. As a result, you get fully spherical Ambisonic sound to match your VR Video/360 content allowing for a total immersive experience.

VR MICROPHONE

Microphone to be used in parallel with VR camera's for full VR experience: The AMBEO VR mic is a microphone specifically designed to allow users within VR production to capture 360 degree audio.

The AMBEO VR Mic is in production since Sept 2016 and available. Art No. #507195.

Pricing is as follows:

1.500 EUR ex tax (VAT)

$1,650 ex tax

WHAT'S IN THE BOX

- AMBEO VR MIC
- Rycote INV 7 Suspension mount
- Split cable 4XLR
- Wind shield
- NEW! Extension cable 1.5m, DIN12F to DIN12M

BUNDLED SOFTWARE

- A-B format Converter (for use in post-production), available for free as download from Sennheiser homepage; VST, AAX and AU plug-in format (for Mac and Windows) for mostly used DAWs to offer best integration into existing VR creation workflows

- The plugin can correct the microphone's physical positioning and rotate its direction
- Different output standards (including ambiX for YouTube 360 video) can be chosen

BACKGROUND AND 6-MONTHS STATUS

The AMBEO VR mic has been showcased on several occasions since CES 2016 under the "AMBEO" umbrella, demonstrating Sennheiser's commitment to helping creators "shape the future of audio" by providing them the tools they need to create great sound experiences.
The AMBEO VR Mic won two awards during CES 2016.
With the upcoming AMBEO VR Mic sales campaign, we are addressing users and customers that move into creating VR content. It is the right time to talk to content creators and present demos on the Samsung GEAR VR HMD's that show clips recorded with both the mic and a 360 camera. These clips easily demonstrate what the USP is.

IS IT A NORMAL MICROPHONE?

Essentially "Yes" the AMBEO VR mic is the same as any other microphone. The main difference is that with most microphones you have a single capsule, the VR microphone has four capsules in a tetrahedral cluster.
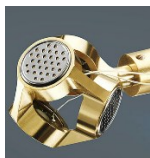
WHY FOUR CAPSULES?

The four cardioid condenser capsules are arranged in a tetrahedral cluster. This permits the capture of sound from all directions and provides what is called Ambisonic A-Format.

HOW ARE THE FOUR SIGNALS RECORDED?

In order for the AMBEO VR Mic's Ambisonics principle to operate correctly, it is important that each, of its four capsules are recorded in the correct order, on individual tracks, using separate identical microphone pre-amps and at equal gain levels. This will require a 4+ channel field recorder.
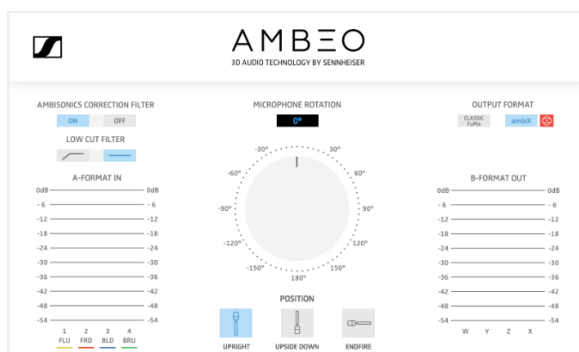
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The correct order for recording is:

- **Ch1, FLU – YELLOW** (Front Left Up)
- **Ch2, FRD – RED** (Front Right Down)
- **Ch3, BLD – BLUE** (Back Left Down)
- **Ch4, BRU – GREEN** (Back Right Up)

This "A-Format" file package is then converted to "B-Format" via the Sennheiser A-B converter (Free Download). Once it is converted into "B-Format" (this is FOA "First Order Ambisonics" or "Plain Old Ambisonics POA") this file is represented by four components:

W – Omni Component, X,Y and Z Figure 8 (Front/Back, Left/Right and Up/Down respectively.

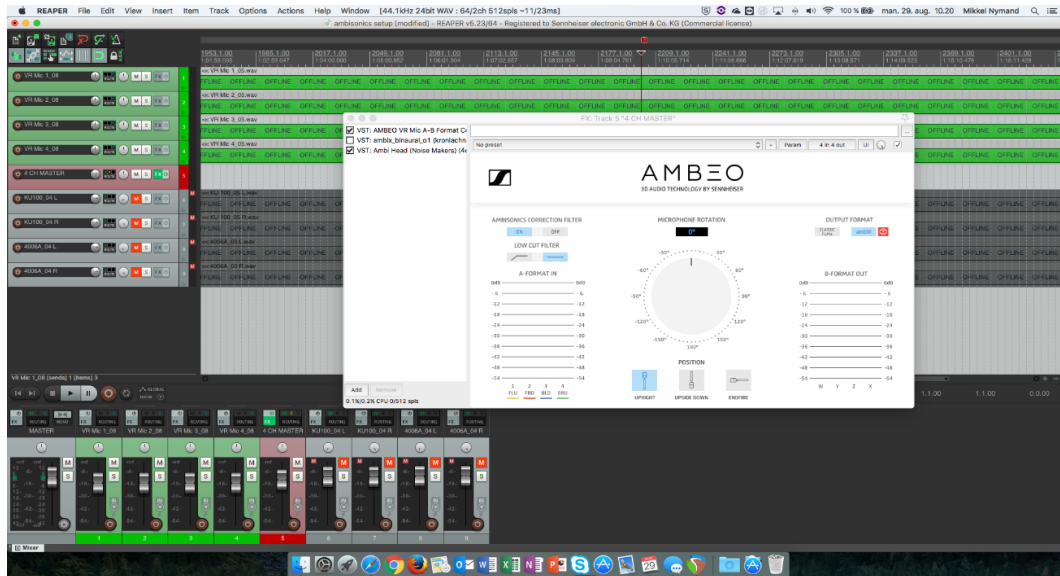Sennheiser A-B Encoder   "B-Format" W,X,Y and Z
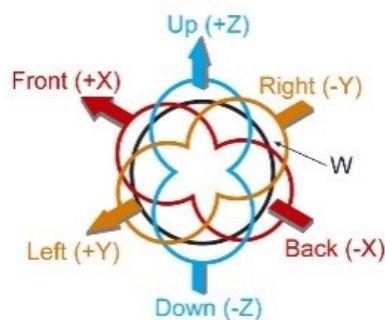
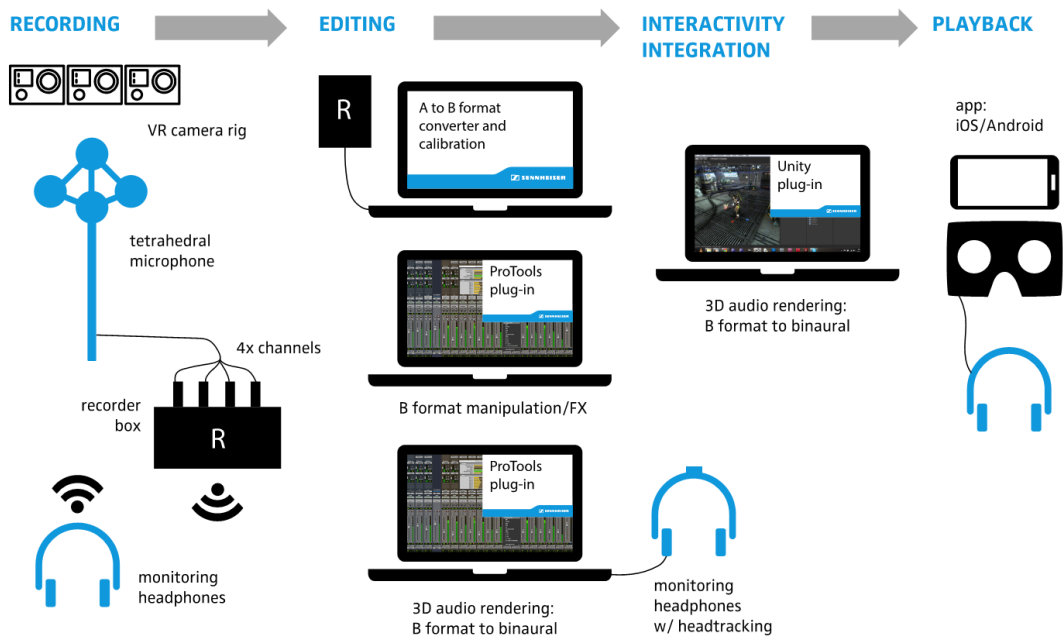## HOW DOES THE "B-FORMAT" PROVIDE 360 DEGREE AUDIO

Once in your preferred DAW (digital audio workstation) you are able to place the "B-Format" file on the surround bus and integrate this into your preferred workflow to synchronize with your video to create a fully immersive 360 degree audio-visual experience.

AMBEO PLUG-IN WITH REAPER

WORKFLOW EXAMPLE

RECORDING → EDITING → INTERACTIVITY INTEGRATION → PLAYBACK

VR camera rig

tetrahedral microphone

4x channels

recorder box

monitoring headphones

A to B format converter and calibration

ProTools plug-in

B format manipulation/FX

ProTools plug-in

3D audio rendering: B format to binaural

monitoring headphones w/ headtracking

Unity plug-in

3D audio rendering: B format to binaural

app: iOS/Android

- RECORDING: USE A MULTI CHANNEL FIELD RECORDER OR AUDIO INTERFACE
    - with minimum 4 individual channels, e.g. Zoom F4, Zoom F8; Sound Devices MixPre-6 or 744/788
    - all suppling 48V Phantom power
    - For correct operation of the AMBEO VR Mic's Ambisonics principle, record each of the four capsules (A-format) in the correct order on individual tracks
    - use separate identical microphone pre-amps
    - at equal gain levels
    - Use a phantom powered tone generator to calibrate gain

2. PROCESSING: ENCODE THE 4 CHANNEL A-FORMAT INFORMATION
    - A-format sound bus to DAW (with multi-channel bus) (e.g. Reaper, ProTools HD, Pyramix)
    - Together with our A-B Format Converter:
        ▸ Decode A to B format: AMBEO plug-in from http://en-de.sennheiser.com/microphone-3d-audio-ambeo-vr-mic
    - B-Format output format: Classic FuMa (Furse-Malham) or ambiX

3. DECODING: THIS STEP DECODES THE 4 B-FORMAT CHANNELS
    - by using a Binaural Decoder (e.g. NoiseMakers AmbiHead, Harpex-X, ambiX suite, FB360 Spatial Workstation, Blue Ripple Sound)
    - to listen through normal headphones

4. DELIVERING: THE FULL SCALED WORKFLOW FINALLY DELIVERS 3D IMMERSIVE AUDIO CONTENT TO
    - HMD's (Head-Mounted Display) such as Oculus Rift, Gear VR or HTC Vive
    - VR Game Engines, e.g. Unity, Unreal
    - Social Media platforms, e.g.
        ▸ Facebook 360 (use Spatial Workstation)
        ▸ YouTube 360 (use ambiX and spatial metadata injector or Spatial Workstation Encoder)

WHAT IS THE OUTPUT OF THE AMBEO VR MIC?

The AMBEO VR Mic outputs 4 x audio signals (one for each capsule) via a multi-pin connector at the base of the microphone. A special cable then splits the individual audio channels into 4 x Standard XLR 3F connectors identified numerically and by color.

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## DOES THE VR MICROPHONE NEED PHANTOM POWER?

Yes, the AMBEO VR Mic requires 4x 48v Phantom power (each capsule is a separate channel).

WHAT IS THE CORRECT POSITIONING OF THE VR MIC?

Attach the microphone to the suspension mount. The basket may point to the top (upright), downwards (upside down) or to the front (endfire). We recommend to use upright position.

In this position recording will deliver the best results as reflexions from the mic itself and from the ground will be minimal.

The direction of sound and video recording need to be same. This will allow easier post-production when matching audio and video signals. „FRONT" and the Sennheiser Logo mark the correct direction: Both indications should be visible when mounted to the suspension.
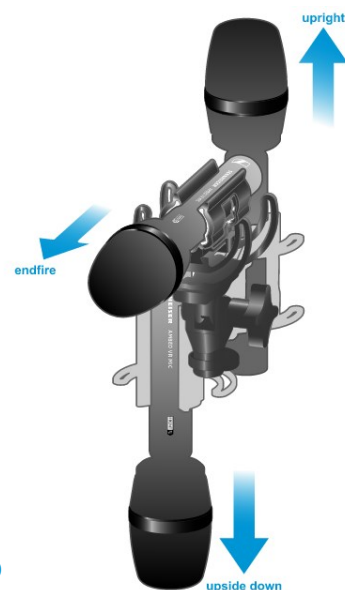
SUMMARY – AMBISONICS A TOOL TO CREATE NEW WORLDS OF SOUND

The AMBEO VR Mic works with Ambisonics, a multi-channel technique that lets you spherically capture the sound arriving from all directions, at a single point in space. For playback this representation is rendered binaurally, allowing you to virtually rotate the orientation of the perspective in all directions, horizontally and vertically. Ambisonics is also supported by all major post-production and playback tools on the market today, this makes Ambisonics the appropriate tool for Virtual Reality and other applications involving 3D sound.

RECOMMENDED ACCESSORIES FOR OUTSIDE USE

Rycote Special 80 Windjammer, for use over the foam windshield #055308

€26.00, $40.00, £23.00 (Nov. 2016)

Rycote BBG 25mm, for high wind conditions, #011003
€82.00, $135.00, £71.30 (Nov. 2016)

Rycote BBG Windjammer, #021801 €41.00, $68.00, £35.70 (Nov. 2016)

APPLICATION PICTURES

Most recommended set-up = upright

More e.g. on https://www.instagram.com/explore/tags/ambeo/