

Introduction

The perception of a direct sound in free field is dependent on the head proportions of each user:

- The size of the head affects how much a sound is delayed and dampened when arriving at the ear opposite to the source's direction.
- Additionally, shape and orientation of the ears affect how bright or dull a source sounds when coming from the front compared to the rear, due to the pinna reflection/obstruction.

These parameters greatly influence the accuracy of the perceived localization, and the extent of externalization.

The importance of precisely setting these parameters depends on the purpose of the binaural render: shared with other people, or best personal experience.

Shared with other people

L-Acoustics has defined average parameter values. These default settings provide consistent experience amongst most listeners.



Make sure to write down previously optimized settings for later use before resetting to the default settings.

Press the **Reset** buttons to load the default settings before sharing with other people.

Best personal experience

When creating or preparing content to be played through a real speaker system, it is possible to improve localization and externalization in the binaural mix by calibrating the head size and the ear angle parameters.

Calibration makes the mix respond better to the user's head proportions, ensuring that what is heard in binaural is closest to what the result on real speakers sounds.

The use of a head tracker further improves the personal experience; however, it has no impact on the way the calibration should be performed.

The following procedure helps finding values that provide better localization and externalization.

Calibration

Pre-requisite

- L-ISA Controller (latest version)
- A Digital Audio Workstation (DAW)
- A stereo track as a reference for equalizing the headphones outputs
- The L-ISA binaural calibration package, containing:
 - L-ISA session (L-ISA binaural calibration.lisa)
 - Voice track (L-ISA binaural calibration - Voice.wav)

Initial setup

Procedure

In the DAW:

1. Create a new session (48 kHz, 24bits).
2. Select the Audio Device:
 - If using the L-ISA Processor Hardware, select the external audio device that interfaces with it.
 - If using the L-ISA Processor Desktop, select the L-ISA Audio Bridge.
3. Import the reference stereo track and the voice sample, following this direct output routing:
 - Stereo track: Output 1-2
 - L-ISA binaural calibration - Voice.wav: Output 3
4. Create a loop matching the voice sample duration and launch the playback with all tracks unmuted.
 From now on until the end of the calibration process, there is no need to go back to the DAW. All the following actions are performed in the L-ISA Controller. For exclusive solo of a track, press (Alt) + (SOLO).

In L-ISA Controller:

5. Load the L-ISA binaural calibration.lisa session.
6. Connect to the L-ISA Processor.
7. Select the External Headphones as the Output in the Processor.
 There are five Snapshots in the L-ISA session:
 - Snapshot 1: objects at +0°
 - Snapshot 2: objects at +45°
 - Snapshot 3: objects at -90°
 - Snapshot 4: objects at +90°
 - Snapshot 5: objects at -91°
8. Solo the reference track (Objects 1 and 2).
9. Load Snapshot 1.
10. Adjust the monitoring EQ until the frequency response sounds correct.
 Refer to the **L-ISA Controller** help for more information on **Monitoring**.

Setting the Head size (Localization)

Procedure

1. Solo the voice track (object 3).
2. Load Snapshot 2.
3. Adjust the head size until the sound feels like it is coming from 45°, front right.

Setting the Ear angle adjustment (Externalization)

Procedure

1. Solo the voice track (object 3).
2. Go back and forth between Snapshots 3 and 4, then between Snapshots 4 and 5 (waiting for each snapshot cross-fade to complete):
 - Decrease the value:
 - If the trajectory seems to take a path above the head when passing through 0°, Soundscape centre.
 - If the object sounds muffled when passing through the 0°.
 - Increase the value:
 - If the object sounds overly muffled when passing through 180°, Soundscape rear centre.
 - If the object sounds brighter when passing through 0°.

What to do next

Depending on the head proportions, the user may not perceive much difference. In that case, it is recommended to stick to the default ear angle value. Avoid pushing the parameter too far because this could negatively impact the tonal balance of the mix.