Introduction to the Soundskrit Cricket Kit

Figure 1: Soundskrit Cricket Kit

The Cricket kit is an easy-to-use evaluation kit designed to demonstrate Soundskrit's speech-to-text-optimized speech isolation and noise reduction algorithms for smart glasses. It includes the Cricket, a glasses prototype with two orthogonal Soundskrit dipole microphones and an omnidirectional microphone, connected to Soundskrit's custom audio interface board, and a Windows-based GUI.

These microphone signals are used to isolate the voice of the wearer of the glasses and the voice from a person in front of the wearer. These two isolated speech signals can be fed into a speech-to-text or translation signal processing chain, to voice calls or other applications.

What's In the Box	
Cricket with audio interface, mounted on glasses	Glassed with attached microphones
Soundskrit PARDI audio interface	USB audio interface to connect the microphones to PC
Microphone cables	Cables to connect the Cricket microphone PCB with the audio interface
USB A to USB C Cable	Cable to connect the Soundskrit audio interface to your computer

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Quick Start Guide

Installation

To get started, connect the prototype to your PC using the included USB-C to USB-A cable.

Launch the installer file ‘Installer_Cricket_Soundskrit.msi’ which can be found at soundskrit.ca/cricket and follow the installation procedure. You may have to approve installation from an unknown publisher.

To start the software, search from the Windows start menu for ‘Soundskrit GUI Cricket’ or use the desktop shortcut generated by the installer.

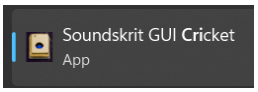


Figure 2: Soundskrit DOA GUI in Windows 11 start menu after installing the software.

Initial Configuration

In the interface, select *Options* and then *Audio/MIDI Settings…* in the top left:

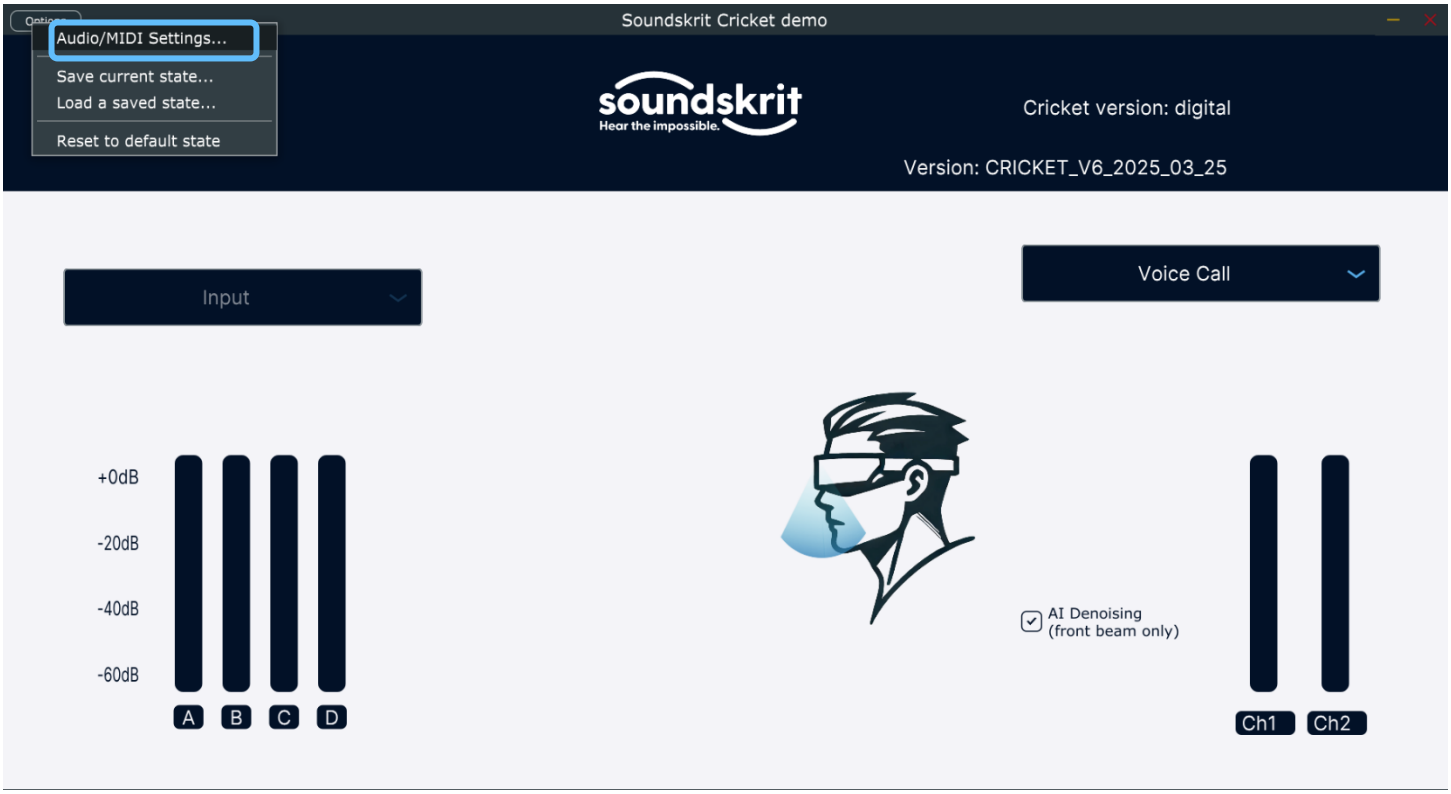


Figure 3: Options Menu in Soundskrit Cricket GUI

In the options menu, ensure that the following options are selected:

Option	Selection
Feedback loop	Mute audio input should not be selected
Audio device Type	Windows Audio
Output	Digital Audio Interface (Soundskrit 6ch 24bit)
Input	Digital Audio Interface (Soundskrit 6ch 24bit)
Active Input Channels	Input channel 1 + 2 Input channel 3 + 4
Sample Rate	48000 Hz
Audio buffer size	480 samples (10.0) ms
Active MIDI Inputs	Leave empty

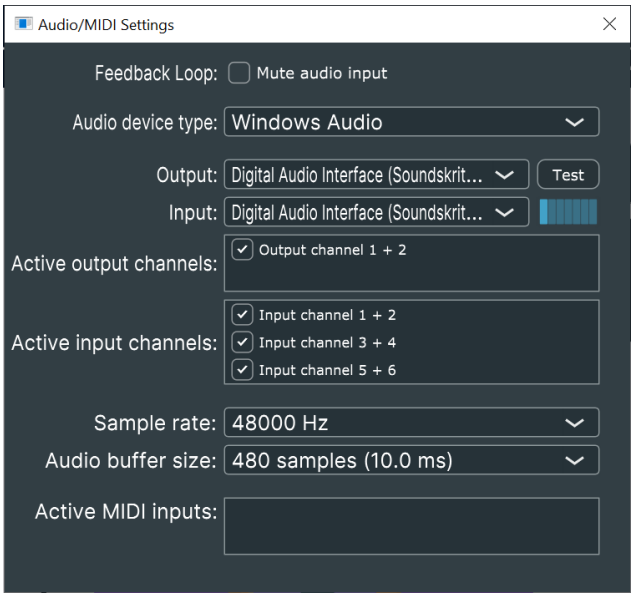


Figure 4: Properly configured options menu

Software Overview

In the bottom left, there are levels for each of the three microphones built into the prototype. The microphones labeled ‘Y’ and ‘Z’ are two orthogonal Soundskrit dipole microphones. Z is pointing downwards in the direction of the wearer’s mouth and Y is pointing forward. The microphone labeled ‘W’ is an omnidirectional microphone which records sound from all directions.

At this point, the blue levels should move if you clap or make noise.

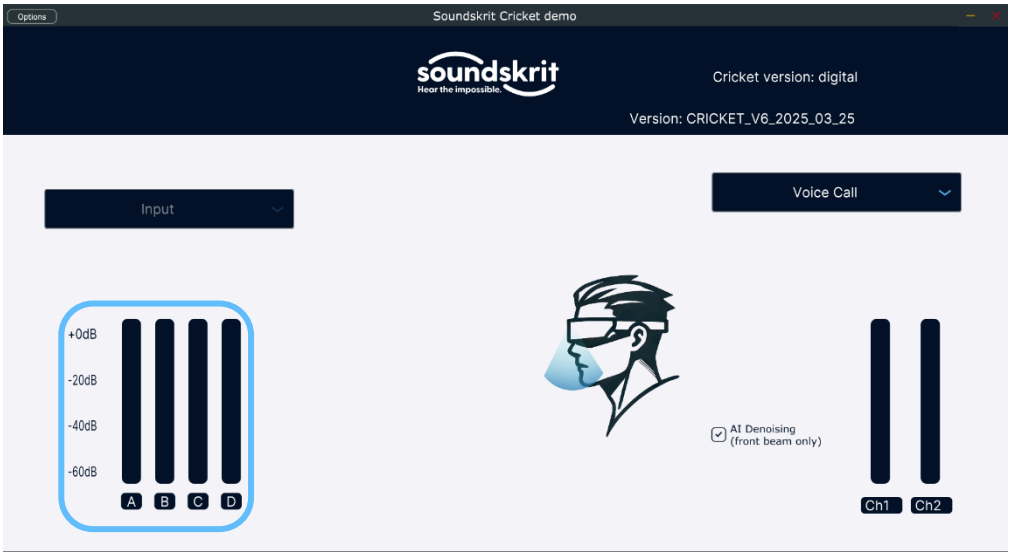


Figure 5: Input signal levels of the three microphones.

On the bottom right are the levels for the two output channels of the stereo output signal displayed.

Using the software

In the top right side of the GUI is a dropdown menu allowing you to select which processing mode to use.

Translation / Transcription

Coming soon.

Voice Call

This mode feeds the wearer's voice to both channels of the output, otherwise the processing is the same as above. This mode can be used when only the wearer's voice is required.

Due to the high level of noise reduction, speech from the wearer is still very clear even in high-noise environments.

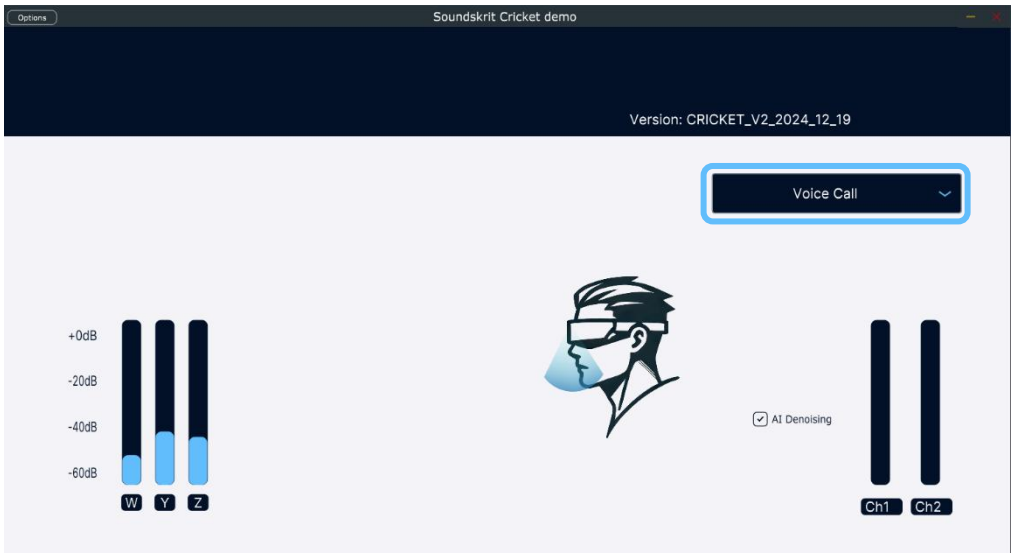


Figure 6: Voice call mode capturing the wearer's voice.

Front Pickup

This mode feeds the speech in front of the wearer of the prototype to both output channels, otherwise the processing is the same as in the translation mode above. It can be used when only speech coming from the front is required.

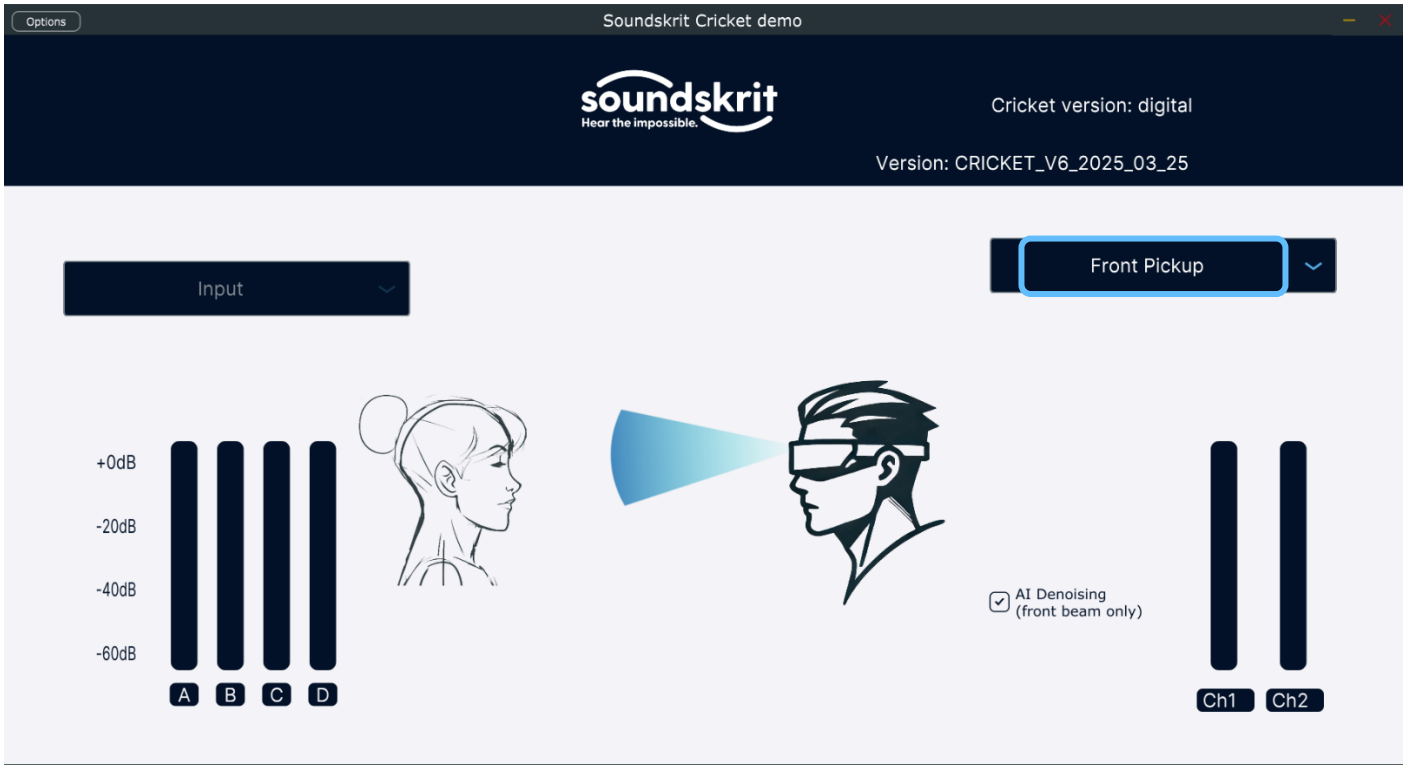


Figure 7: Front Pickup mode capturing speech from in front of the wearer.

Recording Audio with the Cricket

To record audio with the Cricket demo kit, we recommend installing Audacity. Audacity is a trusted, free to use, multiplatform suite of tools for recording and working with audio files.

Once you have installed Audacity, we need to configure the software for use with the Soundskrit's audio interface. Configure the settings as listed below:

Audio Host	Windows WASAPI
Input[1]	*Digital Audio Interface (Soundskrit 6Ch 24bit) Loopback* – Ensure the loopback version of the driver is selected
Output	Your listening device
Channels	2 (Stereo) Recording Channels

[1]Audacity has two versions of each input option, the regular and the loopback, to use our software correctly the loopback mode must be selected. If this is configured correctly, there will be two recording channels listed, while the non-loopback will allow up to 6. Loopback is typically the first of the two versions.

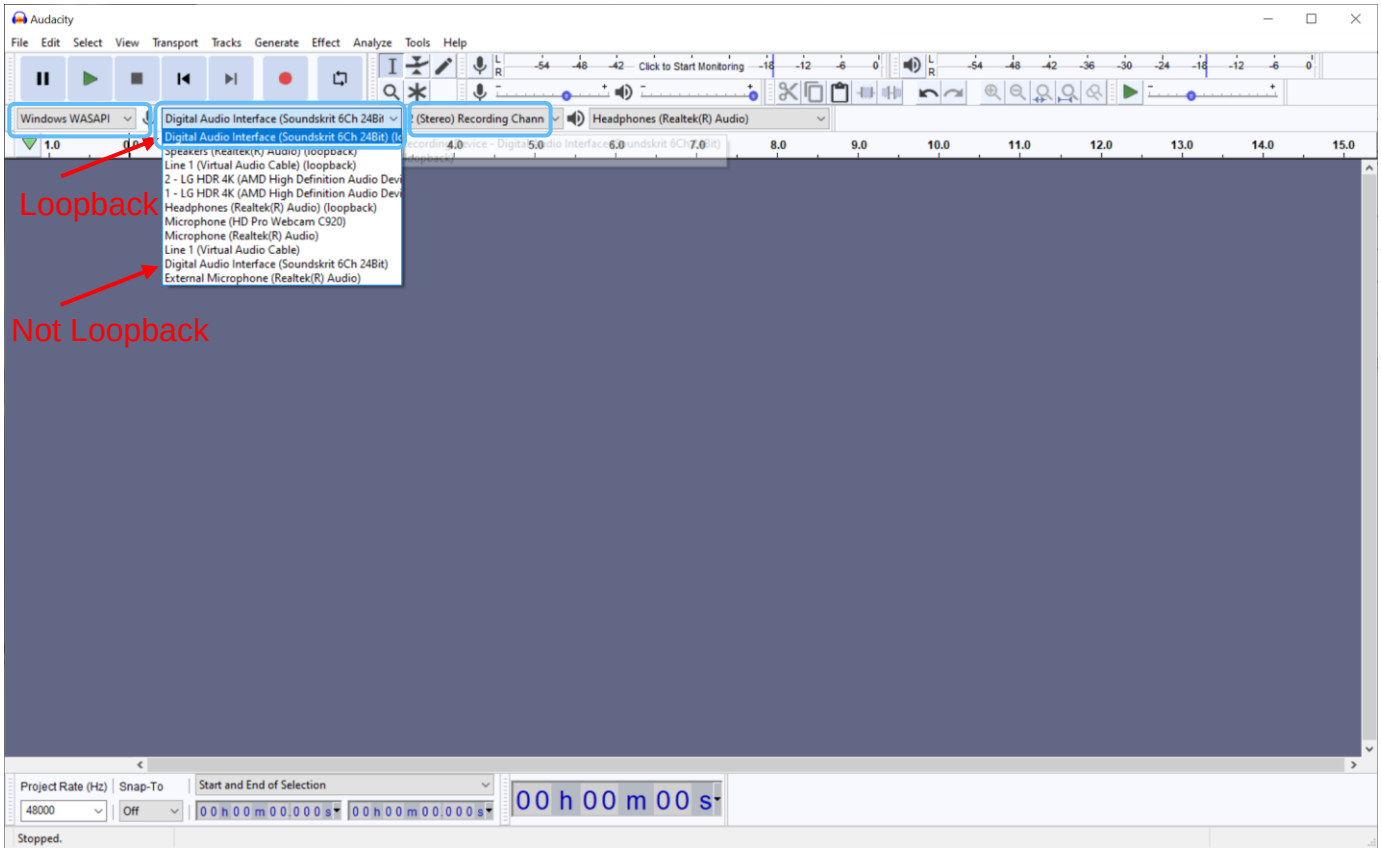


Figure 8: Properly Configured Audacity

To take a recording, press the *record* button and the *stop* button to stop.

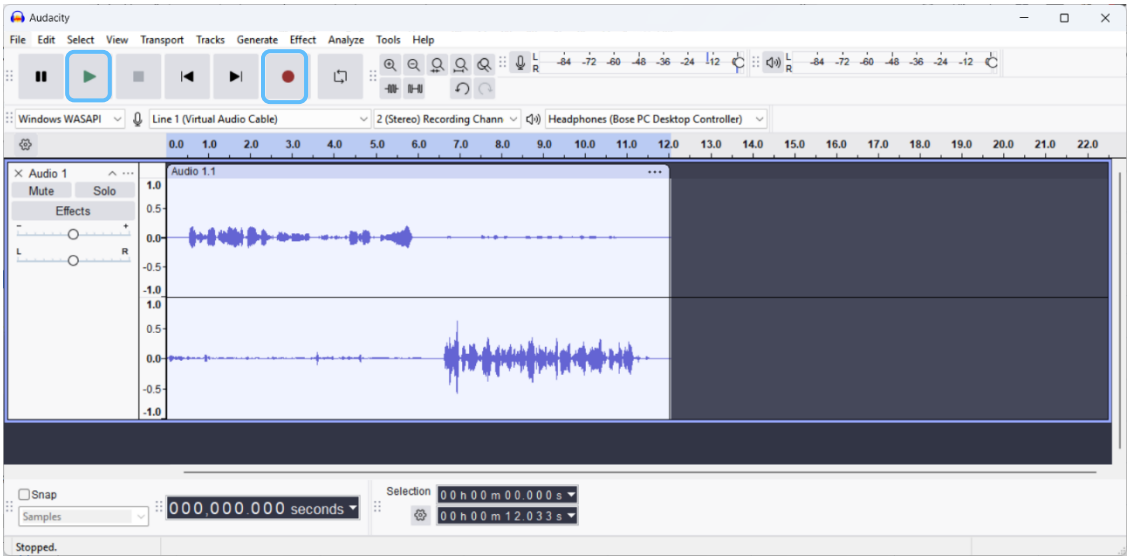


Figure 9: Recording in Audacity.

To listen to only one of the two signals, we need to split the stereo track to listen to them independently. To do this, right click *Audio Track* and select *Split Stereo To Mono.*

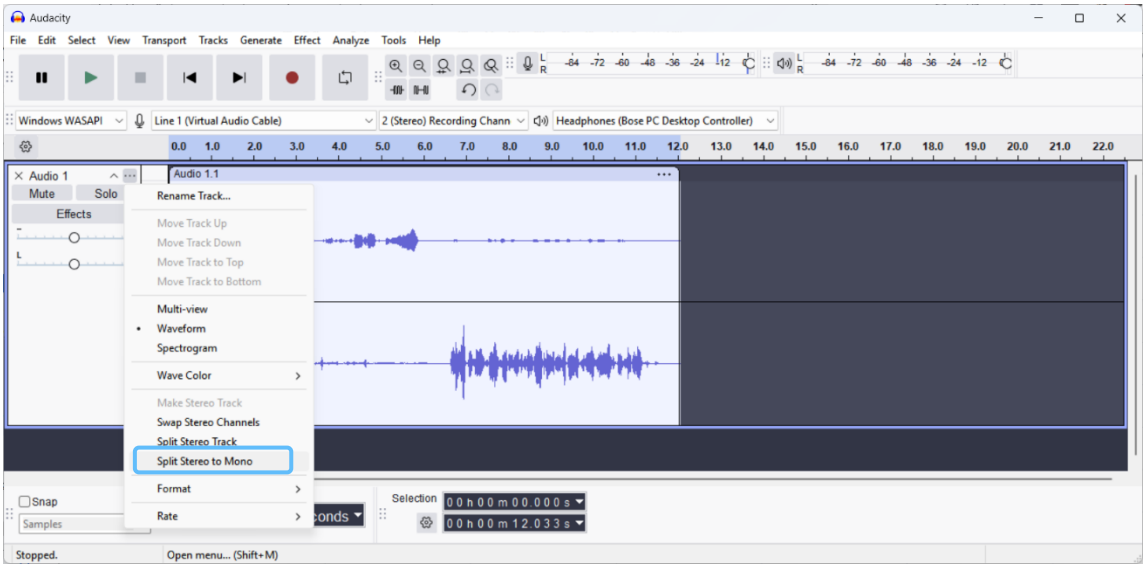


Figure 10: Splitting stereo to mono.

Once you have split the stereo track, you can listen to either track by selecting *solo* and pressing the space bar or play button. In Audacity, the top track corresponds to channel 1 in our software and the bottom track to channel 2 in our software.

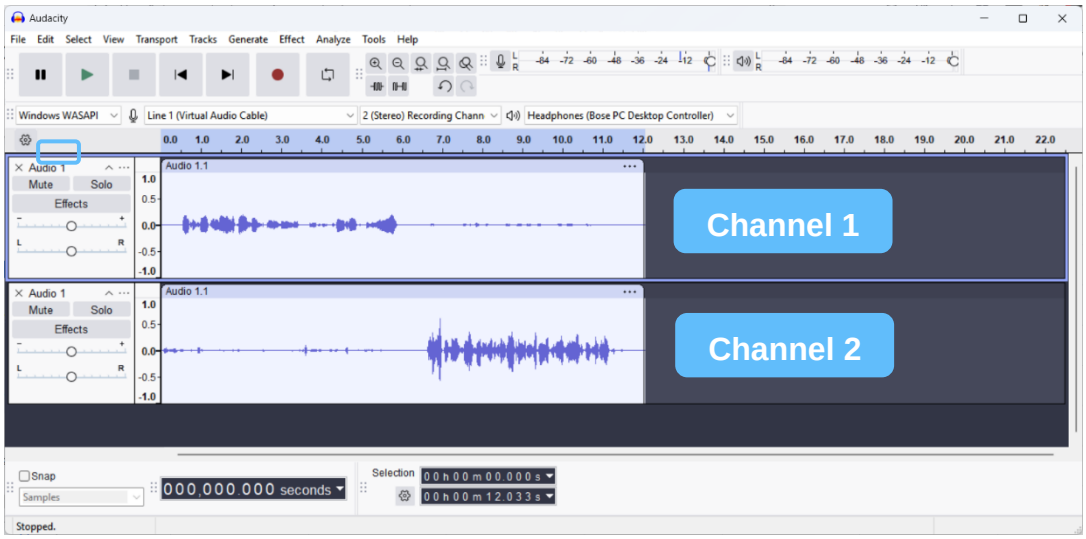


Figure 11: Playing back individual tracks.

System Overview

Hardware

The Soundskrit Cricket consists of glasses with a PCB clipped to the left side of the glasses. The PCB holds two Soundskrit dipole microphones, one facing forward (Y) and one facing downward (Z), and an omnidirectional microphone (W).

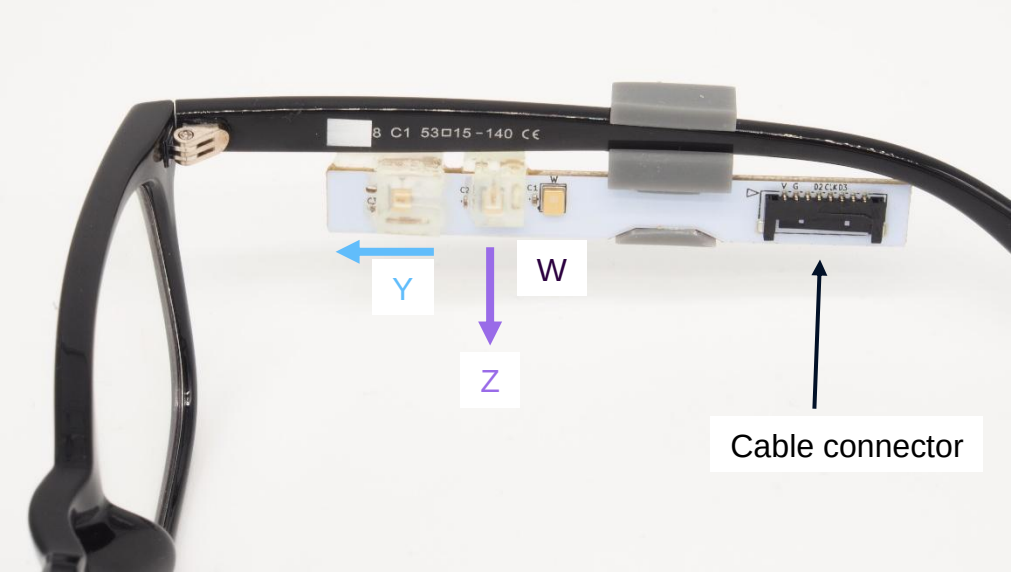


Figure 13: Each microphone module holds a forward-facing dipole microphone (Y), a downward-facing dipole microphone (Z) and an omnidirectional microphone (W). At the back of the module is a connector for the cable to the audio interface.

These three microphones are used to create beamformers directed toward the mouth of the wearer, and one facing forward to pick up speech from someone standing in front of the wearer.

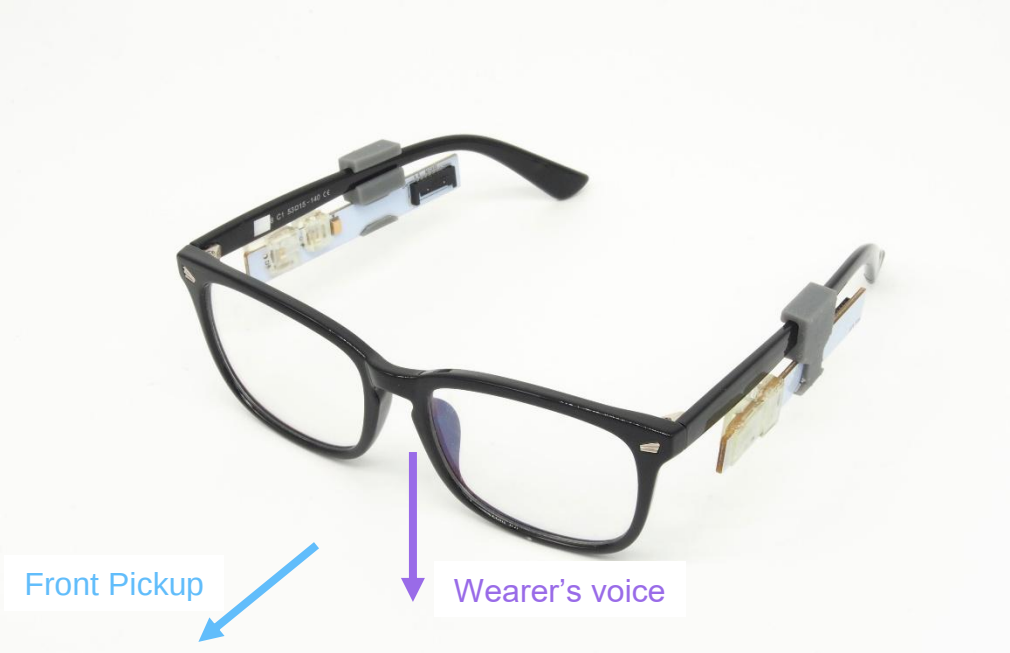


Figure 14: Cricket glasses with microphone modules on each side. Only the left module is used currently in the GUI. The arrows show the beam directions outputted from the GUI: The wearer's voice and front speech pickup.

The PCB is connected with a Molex connector to the Soundskrit PARDI audio interface.

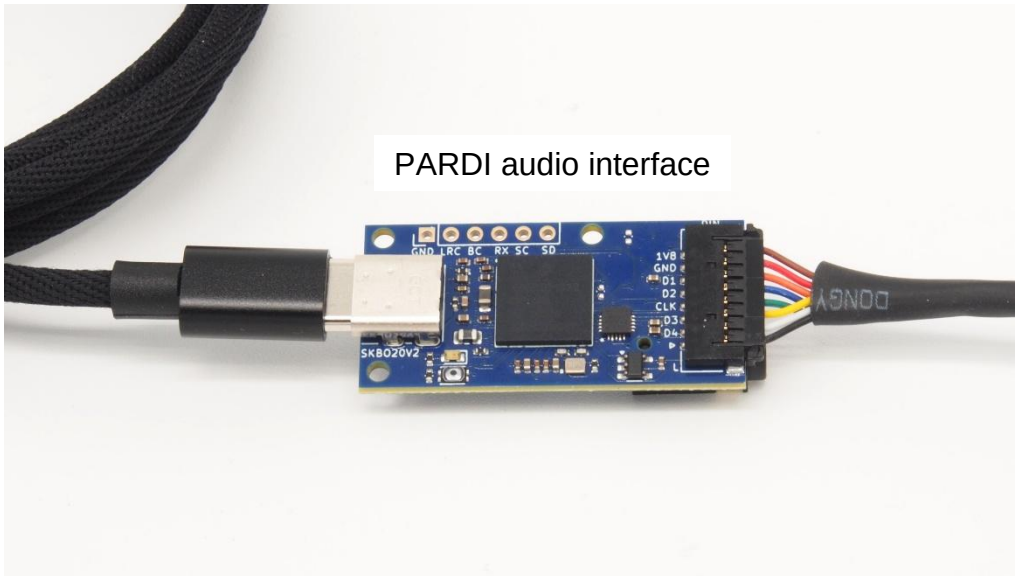


Figure 15: Connection of the Soundskrit multichannel audio interface.

The audio interface connects via a USB-C cable to a PC.

Additional Support

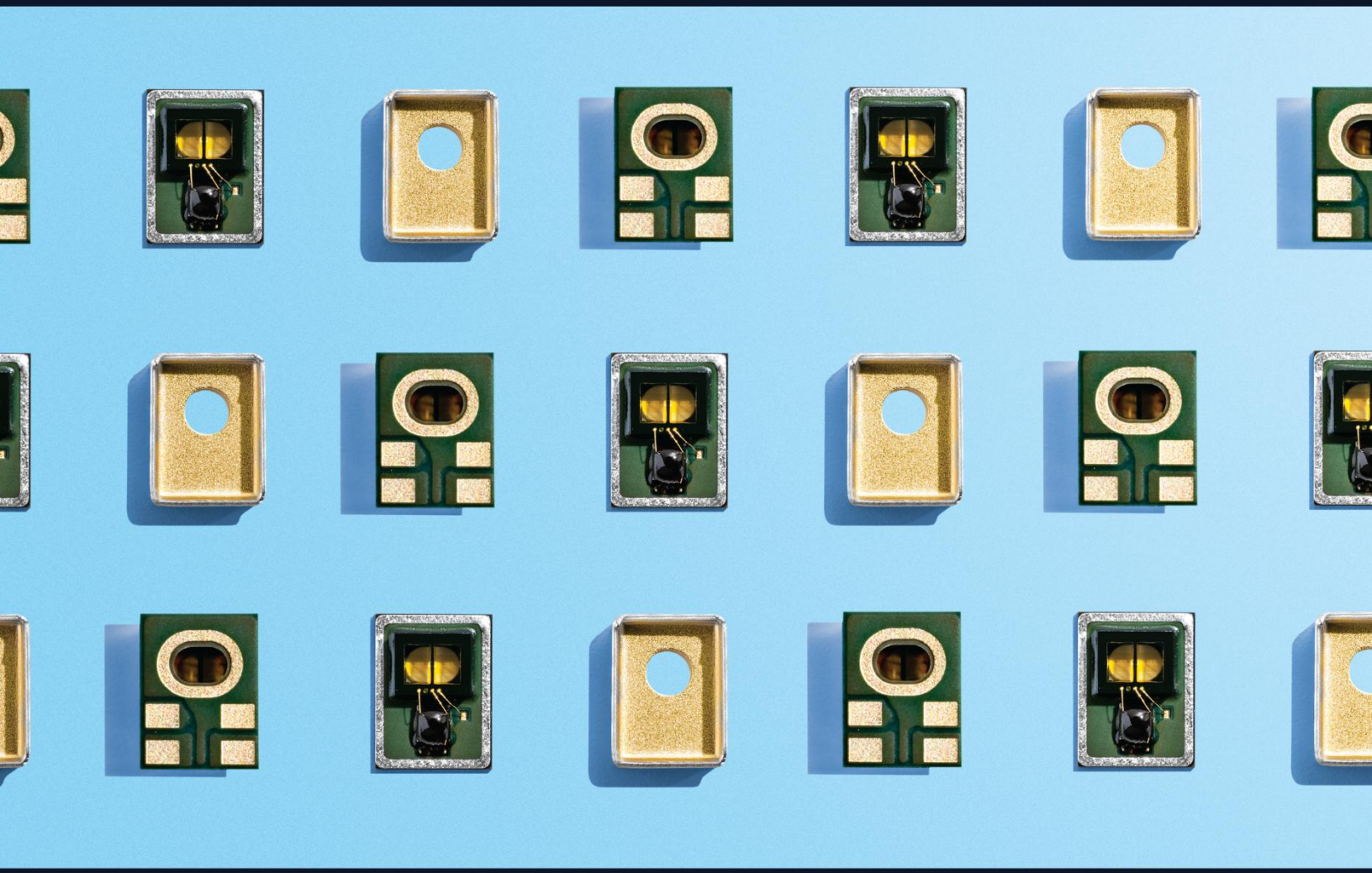
For further information on Soundskrit's products, visit our website at http://www.soundskrit.ca where you can find more application notes, datasheets, and purchasing information. If you have any questions or need technical support, please reach out to applications@soundskrit.ca.

Revision History

Revision Label	Revision Date	Sections Revised
-	January 2025	Initial release
A	March 2025	Update features, screenshots, restructuring

Soundskrit developed the first high-performance directional MEMS microphone on the market, leveraging years of research in bio-inspired MEMS based on how spiders and other insects in nature hear. In combination with Soundskrit's in-house audio processing algorithms, directional microphones can be used to capture and isolate any sound in an environment with a fraction of the size, power, and computation of traditional omnidirectional-based microphone arrays.

Soundskrit was founded in 2019 and is headquartered in Montreal, Quebec with an R&D facility in Ann Arbor, Michigan.



soundskrit
Hear the impossible.