# Description

The augmented stethoscope can play an audio file stored within the on-board memory of the Teensy Audio Board.

# Methodology

The following steps will guide the user in the process of storing a short audio clip into the on-board memory of the Teensy Audio Board;

1. Download [Audacity](http://www.audacityteam.org/download/)®

Note: Audacity® is a free, open-source, cross-platform audio software for multi-track recording and editing. Audacity® can be used for audio file conversion, editing and analysis.

1. **if audio file is in .RAW format**, open Audacity® and import sound file;
   1. Import sound file
      1. *File > Import > Raw Data…*
   2. Enter the Raw Data Import parameter on the pop-up window

Note: Parameters such as **encoding**, **byte order**, **channels**, and **sample rate** of the file must be known

1. **if audio file needs editing,** select and trim the audio clip/region of interest by;
   1. Press the “Selection Tool” button
   2. Select audio clip/region of interest
   3. Press the “Trim Audio” button

Note: The “Trim Audio” function will eliminate everything by the selected audio clip/region of interest

* 1. Press the “Time Shift” button and slide the clip to time 0.0

Note: This step is not necessary, but may reduce concerns of storing null data

* 1. Export audio clip/region of interest as an audio file
     1. *File > Export Audio…*
     2. Save as a .WAV file with the same **encoding** used for importing the raw signal

1. Access and extract [wav2sketch](https://www.pjrc.com/teensy/td_libs_AudioPlayMemory.html) application from the *Augmented Stethoscope* GitHub repository
   1. *C:\...\...\Gits\AugmentedStethoscope\Software\Windows\wav2sketch*

Note;

* The path shown above will vary depend on the user’s computer and cloning parameters
* wav2sketch is a script developed by the PJRC team (builders of the Teensy and Teensy Audio Board)
* The wav2sketch application will be found in a compressed folder within the repository

1. **if you are not using the Augmented Stethoscope repo,** download the [wav2sketch](https://www.pjrc.com/teensy/td_libs_AudioPlayMemory.html) application from the PJRC website
2. Move .WAV file of the audio clip/region of interest into the directory of the wav2sketch application
3. Using the windows command prompt (cmd), move to the wav2sketch directory
   1. *cd C:\...\...\Gits\AugmentedStethoscope\Software\Windows\wav2sketch*
4. Execute the wav2sketch application using the command prompt (cmd)
   1. *wav2sketch.exe*
5. Integrate file in the Stethoscope code by;
   1. Moving .h and .cpp versions of the audio clip/region of interest to the directory of the main Stethoscope Arduino code
      1. *C:\...\...\Gits\AugmentedStethoscope\Software\Arduino\Stethoscope*
   2. Modify the Stethoscope code by adding;
      1. *#include name\_of\_audio\_clip.h*

Note: The include function ensures that the compiler knows to read for the header/.h file

* + 1. *AudioPlayMemory.play( name\_of\_audio\_clip\_array )*

Note: This is the function call for playing the audio clip/region of interest

               ....and in the '// GUItool: begin automatically generated code':

                    AudioPlayMemory          playMem\_heartSoundSamp;                                //xy=154,398