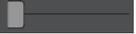# Instruction for use – RAAC via smartphone

For the room acoustic analysis, you will need the following equipment:

- a smartphone with internet connection and a multitrack sound recording software (such as: https://ntrack.com/ios.php),
- an AUX cable and
- a speaker.

Step 1: Prepare the recording device - smartphone

1. Firstly, download the multitrack recording software on your phone. For the purpose of this instruction manual a *n-Track Studio Multitrack Recorder* was used. The recording process may differ when using another type of software.

2. Download the sound sample (RAAC_sample.wav) provided on the RAAC website (www.raac.com/sample) on your smartphone and import it into the multitrack recording software (n-Track). To do this, you open the n-Track app, tap the "Menu" icon and select "Import Audio File".

3. Now add a new blank audio track by tapping on the "Add a blank track" icon and select »Add Audio track«. Check if the added audio track is armed ( ).

4. Check if the sampling frequency and the recording format are correctly selected. Tap the "Menu" icon and select "Settings". Make sure that the "Sampling frequency" is set to 48000 Hz and the "Rec format" to 16 bit.

5. Assign the left input channel to the sound sample (RAAC_sample.wav) by selecting the track with the sound sample file, tapping on the "Mixer" icon and selecting the left input channel ( ). Assign the right input channel to the new audio track the same way ( ).
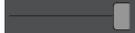
6. Connect the smartphone to the speaker using the AUX cable and turn on the speaker at low volume.

Step 2: Acoustic measurement

1. Prepare the room for acoustic measurements. Close all the doors and windows, turn off all the sound sources and place the speaker into the room. Some basic directions about placement of the source (speaker) and receiver (smartphone) as well as other measurement advice is described below.
2. Play the sound sample and adjust the volume of the speakers so that the volume is higher than 60 dB(A) – like louder television.
3. To begin the measurement, push the "Record" button ( ). Stop recording a few seconds after the sound sample finishes. You should now have a sound recording on the second audio track, similar to figure 1. To save the recording tap on the "Menu" icon and select "Save Song". Choose the "Audio mixdown 16 bit (wav)" format and save the recording.

4. Repeat the measurement procedure (previous step) a few times with different measurement positions to achieve greater accuracy.
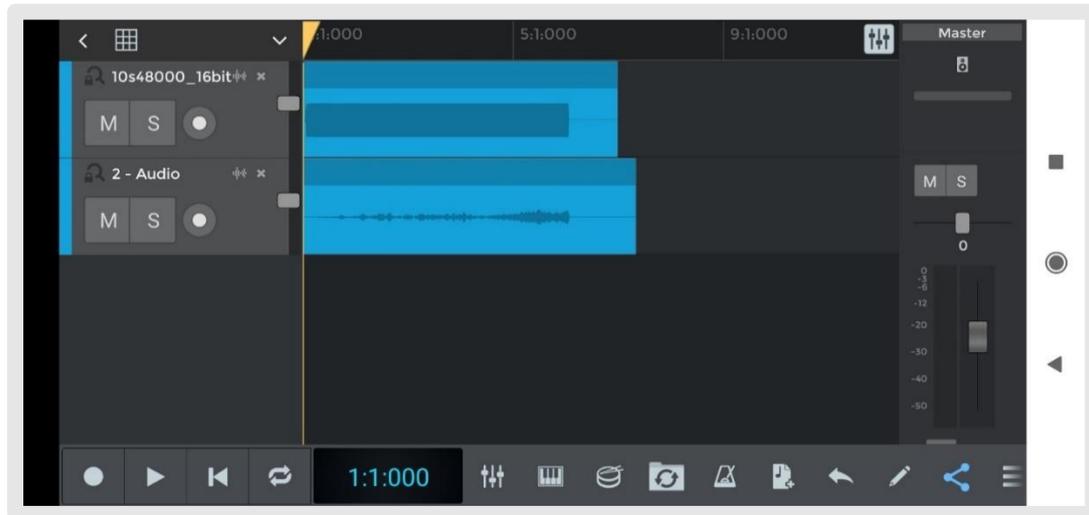
Step 3.: Upload the recordings and download the report

1. Upload the folder containing the recordings to the RAAC website (www.raac.com/upload).
2. Follow the instructions on the website. Input the name of the recordings folder. Project name and Username. Choose wether you wiss to include both the octave band analysis and the third octave band analysis by inputing "y" for yes or "n" for no.
3. Tap on start.
4. Download the report.

Directions for measurements
- More measurements you make, more precise the result. Typically, at least 12 measurement combinations with at least two different source positions are performed. An example is shown in figure 1.
- The distance between the source and the receiver should be at least 1 m. The distance between a reflecting surface (floor, wall...) and the receiver positions as well as the source positions should also be at least 1 m.
- Max. two persons in a room during measurements
- All sound sources (radio, laud ventilation etc.) should be turned off at the time of the measurements so that the background noise is as low as possible.
- Close all the windows and doors leading to adjacent rooms. Otherwise the room should be in the state that is usually used in (no need to move or remove any furniture, equipment or other elements).