Date: 30th October 2020

Name: Jigar Rajpopat

Swept-Sine Analysis

Objective: Capture a room's Frequency response and Impulse response with and without 'Sonarworks Reference 4' enabled, and provide observations.

Signal Flow:

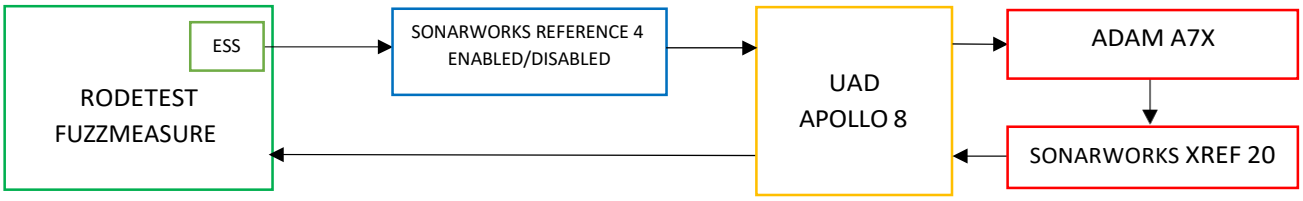
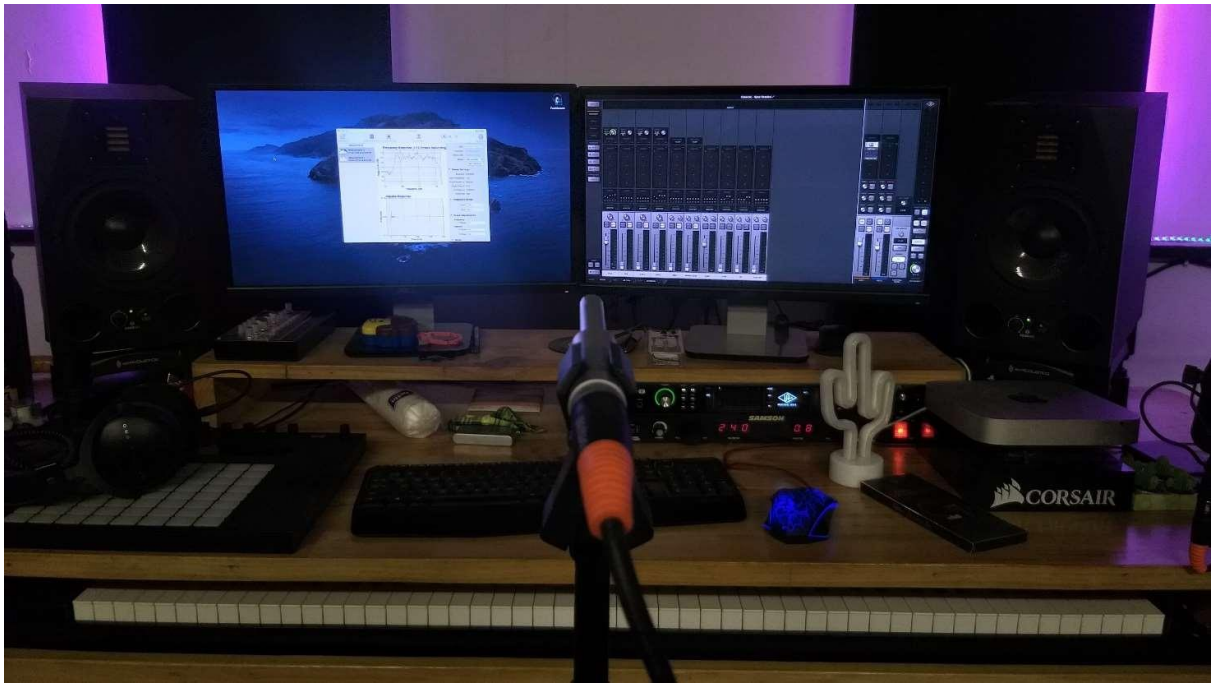


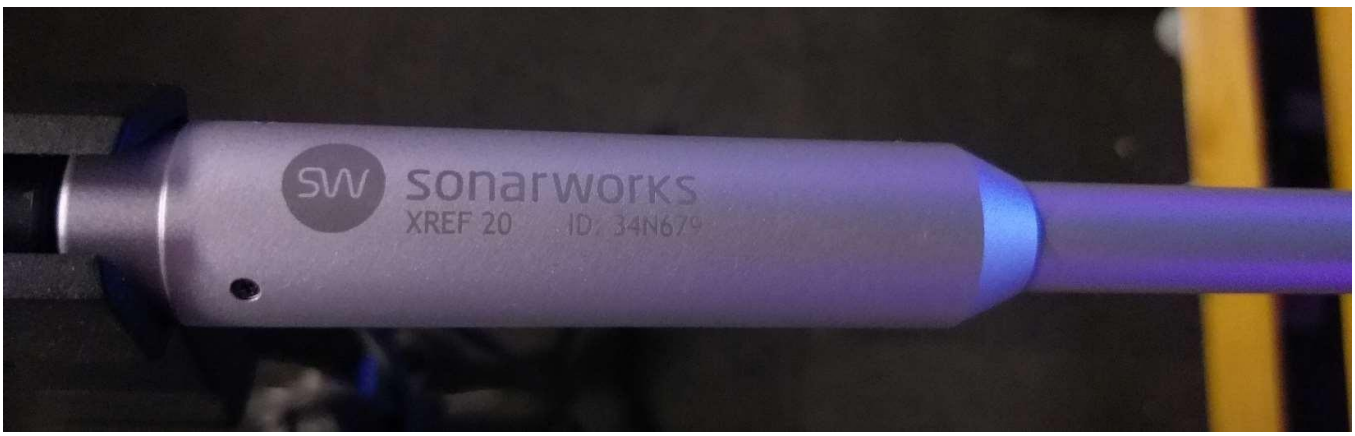
Fig. 1 (ESS – Exponential Swept Sine)

Specifications:

- Each set of measurements involved measuring with respect to the sweet spot with the mic facing these directions- Front, Front, Left,Right, Back, Up, Down.
- Duration of each sweep: 5 secs.
- One speaker at a time. (total 7x2x2 = 28 measurements)
- No clipping.

Pictures:





Observations:

Fig. 2- Left Speaker (With and Without Sonarworks Reference 4)

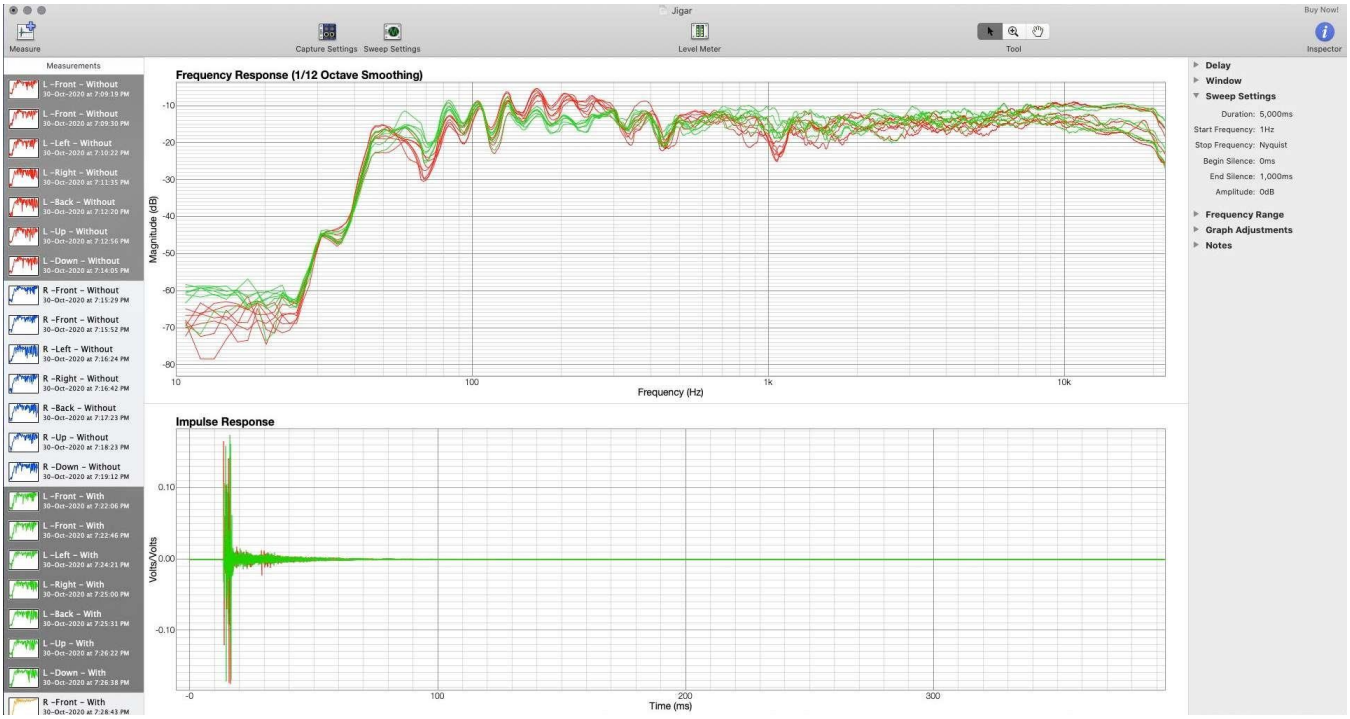
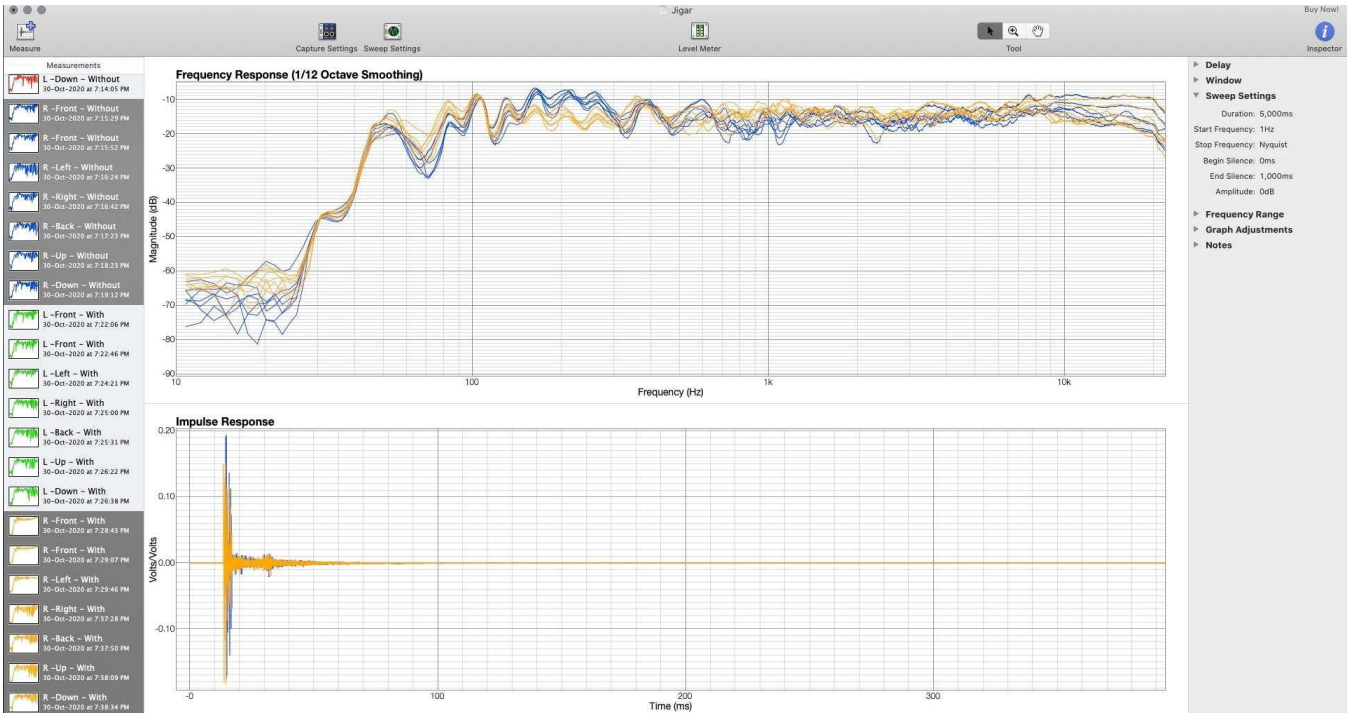


Fig. 3- Right Speaker (With and Without Sonarworks Reference 4)



From Fig. 2 and 3, we can see that there's unwanted room contribution to the frequency responses obtained with Sonarworks Reference 4 disabled, particularly from 150 Hz to 300 Hz (standing waves, most probably), and around the 1K Hz range. Frequency responses obtained with Sonarworks Reference 4 enabled, however, have relatively flat frequency responses from 80 Hz. It corrects the boost (150 Hz-300 Hz) and dip (around 1K). For the impulse response, the extra processing needed by Sonarworks Reference 4 was addressed by changing the buffer size in Sonarworks Reference 4 Systemwide so that the graph looks similar with respect to the X-axis in both the cases.