

Waveform Windowing Example Sequence

Introduction

The purpose of this sequence is to demonstrate how SoundCheck's Windowing post-processing function can be applied to waveforms to remove measurement artifacts that might otherwise create false auto delay values and subsequent analysis errors.

The data used in this demo sequence came from a customer who was measuring the directivity of a hearing aid-type device by mounting the DUT on a HATS and rotating it on a turntable while using a short duration (12ms) log sweep. The DUT does not have a perfect seal in the HATS ear and has signal processing which produces a latency of around 35ms. When viewing the Recorded Time waveforms, we can see the leakage signal at ~2.5ms and the amplified signal at ~38ms. As the DUT approaches 180° the magnitude of the leakage into the HATS ear exceeds that of the amplified signal which creates false Record Delay values and subsequent analysis errors. By applying a window to the Recorded Time Waveform, we can remove the early-arrival leakage, calculate the true Record Delay values of the amplified signal, and get consistent analysis results at all angles of rotation.

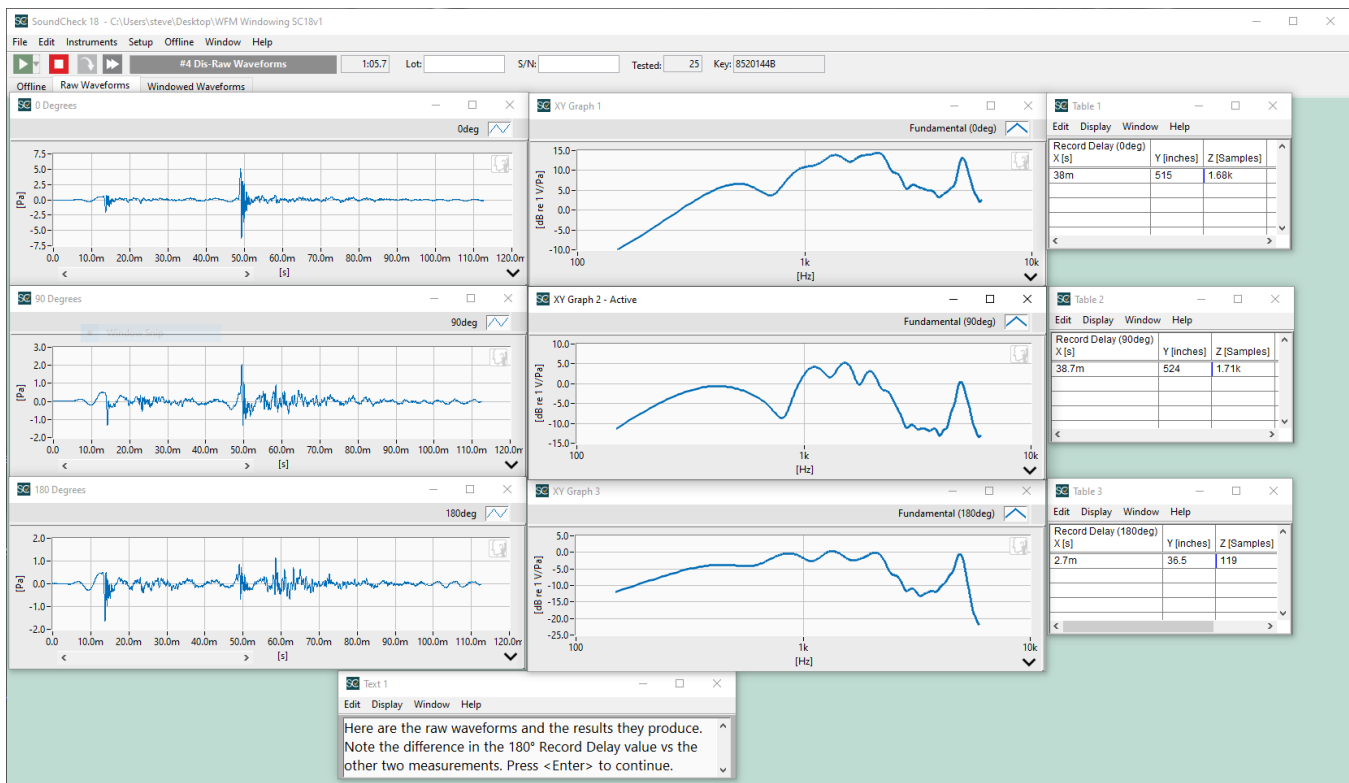


Figure 1 – Initial Display of *Waveform Windowing* Sequence showing windowed waveforms and results



Hardware Setup & Calibration

This sequence uses recall waveforms, so no hardware is required. Since this windowing technique can be used with a variety of different devices and hardware setups, it is up to the user to deploy the windowing in their own sequences using the appropriate calibrated hardware.

Software Requirements

- SoundCheck 18.0 or newer
- SoundCheck Plus (part number 1102)
- Time Selective Response (part number 2006)

System diagram

Not applicable

Sequence Logic

Type	Step Name	#	Out	In	
Sti	Mic Polar LogSweep	1	Source Speaker		
Rec	Recall waveforms	2			// Recalls 0°. 90°. 180° recorded time waveforms
Ana	TSR polar	3			// Batch analysis of recalled waveforms
Dis	Raw Waveforms	4			// Display raw waveforms and analysis results
Pos	Windowing	5			// Remove first 30 ms from recorded time waveforms
Ana	TSR polar	6			// Batch analysis of windowed recorded time waveforms
Dis	Windowed Waveforms	7			// Display windowed waveforms and analysis results

Further sequence development

Ways in which you could modify or further develop the sequence include:

- Adapt the windowing function to your own specific requirements. Examples include:
 - Removing early arrival signals from a waveform
 - Editing out excessive delay in a waveform