

# Sound Lab TDS Enhancements for RT60

## Overview

An important issue in sound and acoustics is accurate reproduction of sound and the ability to reproduce speech without loss of intelligibility. An important tool in sound measurement is the ability to measure the time it takes for a signal of a particular frequency to be absorbed by the environment. The measurement of this absorption time is known as the RT60 time, which can be evaluated using different methods and different bandwidths. The RT60 time is an evaluation of how long previously produced signals take to decay to the point where they no longer interfere with newly produced sounds or speech.

Sound Lab's TDS module is a primary method for evaluating the RT60 time for a room. The advanced time and frequency filtering available in TDS can greatly improve the signal to noise ratio in the measurement and increase the accuracy of the measurement by lowering the apparent noise floor. However, there is still a great deal of work involved in processing the several dozen of frequency bands involved in doing a third octave RT60 measurement and making an octave measurement still involves entering all the parameters required in making each measurement.

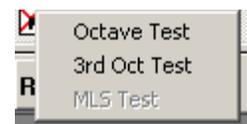
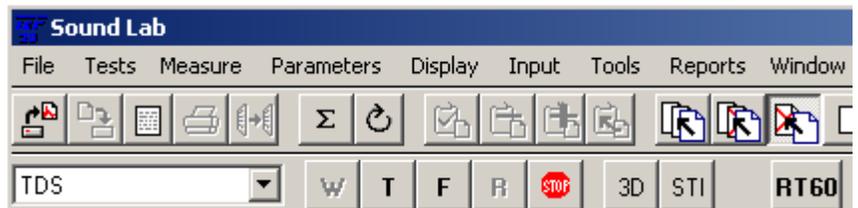
## Automating the process

The updated TDSE60 software contains several updates to enhance the RT60 measurement process. The first

important update is the automation of the RT60 measurement process. The measurement is started by clicking on the **RT60** button which is now present on the second toolbar. Clicking on this button causes a popup menu to display, which allows the user to select the type and method of the RT60 measurement.

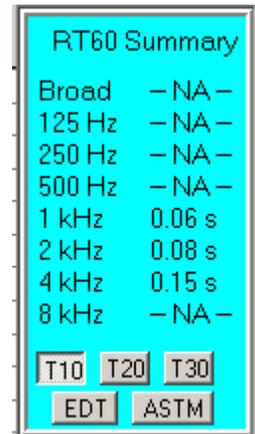
The measurement begins when the user clicks on one of these choices. The proper parameters and sweep time for each frequency band is automatically selected based on the choice and the results are collected and presented as an overlay, with each frequency band labeled and displayed in different colors. The Octave Test generates seven curves

from 125 Hz to 4 kHz and Broad Band. The 3<sup>rd</sup> Oct Test generates twenty two curves from 100 Hz to 10 kHz and Broad Band.



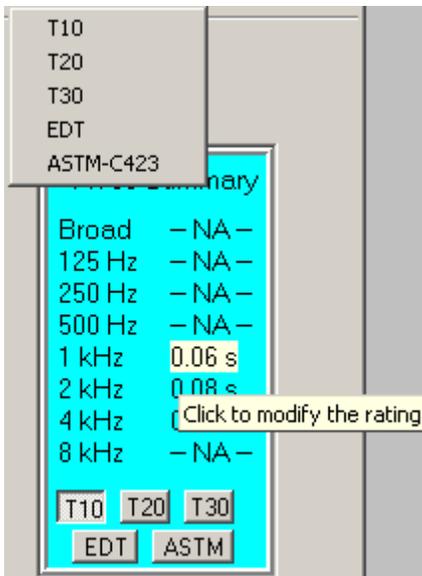
## Displaying the results

The results of the RT60 measurements can be displayed by pressing the **Summary** button. This causes a table to appear with all of the results of the RT60 sweeps. This table is filled out by processing all the ETC data gathered during the automated RT60 sweeps. The table displays N/A if a measurement was not made at that frequency or if there was no good data for that frequency using the current rating method. The current rating method is shown at the bottom of the form and is indicated by a depressed button. This example shows a partial RT60 set using a T10 rating.



Broad	- NA -
125 Hz	- NA -
250 Hz	- NA -
500 Hz	- NA -
1 kHz	0.06 s
2 kHz	0.08 s
4 kHz	0.15 s
8 kHz	- NA -

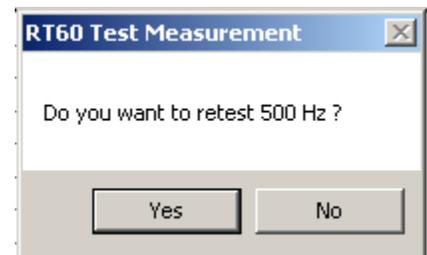
T10 T20 T30  
EDT ASTM



The RT60 rating type can be modified for all the measurements by clicking on one of the other buttons at the bottom of the form. Ratings of T10, T20, T30, EDT and ASTM-C423 are available. The rating for a single RT60 frequency can be changed by clicking on its time. A popup menu allows the user to select the new rating for only the selected frequency.

The test for a single RT60 frequency can be retested by clicking on the frequency. This is commonly done when a good set of measurements were made but one or more of them received a rating of N/A. A confirmation

dialog displays to allow you to confirm the retest. The previous data for that RT60 measurement is replaced by the new data. The summary chart is automatically displayed with the updated information.



## Conclusions

The ability to quickly make and reliably RT60 measurements is an important part of ensuring good sound in modern sound systems. The Sound Lab TDS platform is a proven method for making these measurements with its ability to reject noise that is not part of the measurement. The new enhancements to TDS have now automated and simplified the process of making RT60 measurements by allowing the user to perform many of the RT60 tasks by clicking on a single button at a huge savings of time and effort. A consolidated display gives the user all the answers in a single glance.