

GL60

REVERBERATION TIME ANALYZER

The Model GL60 measures the reverberation time; the measure of how long sound takes to decay by 60 decibels (dB) in a room.

What Is Reverb Time: Reverb time is defined as the time that a sound, once stopped, takes to decay by 60dB. A sound played in a room will bounce off the walls. If the walls do not absorb any sound, the volume in the room will continue to increase as long as sound is being added. Even if the sound were shut off, the volume would not drop because there would be no place for the sound to go. In any real room, the walls absorb sound. The more they absorb, the faster the volume will drop off after the sound is stopped. Certain materials, such as rugs, absorb a lot of sound. Materials such as plaster and glass absorb almost none. The absorption also varies with the frequency of sound. Large rooms have a much greater volume inside for the amount of wall surface, so they tend to have more reverb than small rooms. Reverb time is our method of comparing the amount of bouncing sound (reverberation) in different rooms. (Echo is considered to be the result of a single bounce.)



GENERAL CONCEPTS:

RT60 is a measurement of how long it would take a sound to decay 60dB in a large room. There is great debate as to the value of RT60 in small rooms, or in rooms with an RT of less than 1 second as they are not statistically reverberant. Long RT60 times tends to make it more difficult to understand speech in a room, but may be pleasing for some forms of music. Additionally, in most rooms RT60 times will be longer at the lower frequencies. Gold Line RT60 measurements show both octave band and broadband RT60. In general the octave band information is by far the more useful. RT60 is a powerful tool for predicting intelligibility, and for the selection of type and requirements for acoustical materials. RT60 information also provide guidelines for determining where High Q (directivity) loudspeakers will be essential to maintain intelligibility of speech.

COMMON PROBLEMS:

Because RT60 is a measurement of the sound as it decays, it is essential to have sufficient signal to noise. Especially in the 120Hz Octave band, it is common to have excessive levels of noise from the HVAC system. Accordingly, HVAC should be turned off whenever feasible while making the measurements. The quieter it is in the room, the easier it will be to measure the decay, and to get good data. Also, before making RT60 measurements, you should first measure the frequency response of the sound system. If the loudspeakers cannot produce 125Hz, then obviously it will not be possible to make RT60 measurements at 125Hz. Occasionally, sound systems are also unable to produce 8 kHz with the same results. In many cases you will find that in order to suppress feedback, a prior operator has set the EQ so that there is little or no energy to measure in one of the RT octaves. Setting the EQ temporarily back to flat will typically allow the measurement to be made.

MAKING AN RT60 MEASUREMENT WITHOUT A COMPUTER:

Gold Line model DSP30 along with Model PN3B Pink Noise/Tone generator will allow you to make RT60 measurements without the use of your computer. You can capture the measurements to non volatile memory and download to your computer at a later date.

GENERAL RULES WHEN MAKING RT60 MEASUREMENTS WITH A GOLD LINE DSP ANALYZER:

To obtain valid RT60 measurements it is important to suppress, whenever possible, noise caused by heating or air-conditioning systems, fans, or other foreign noise that could interfere with the measurement. Measurements are best taken when traffic noise or activity is at a minimum. Measurements of RT60 require a sound level of at least 21dB ABOVE the AMBIENT SOUND. It is therefore necessary for the triggering sound source to be a minimum of 21dB above the ambient sound at each of the measured frequencies.

USE OF THE PN3B GATED NOISE GENERATOR:

We recommend Gold Line model PN3B gated pink noise/1kHz tone generator as the preferred triggering "GATE" noise source.

Switch the PN3B to the "PINK NOISE" position and connect the "GATE OUT" of the DSP Analyzer to the "GATE IN" of the PN3B (the correct cable is provided with the PN3B). The PN3B is powered by a user supplied 9V battery inside of the cover at the base.

FEATURES:

- Stand alone RT60 meter with built-in microphone.
- Quickly check sound system performance.
- Select speaker locations.
- Determine microphone placements.
- Determine at what distance a speaker will reinforce sound.
- Battery operated.

SPECIFICATIONS:

MICROPHONE: Built-in omnidirectional electret condenser.

MEASUREMENT FREQUENCIES (Hz): 125, 250, 500, 1k, 2k, 4k.

MEASUREMENT RANGE: 0.01s - 9.99s in 0.01s increments.

DISPLAY: 3 Digit LCD

SELECTABLE INPUT ATTENUATOR: -30dB, -15dB, 0dB.

POWER REQUIREMENTS: 2 - 9V Batteries. Alkaline recommended.

SIZE (W x H x D): 5" x 5" x 2¼"

WEIGHT: 1 lb

CASE & REAR PANEL MATERIAL: High impact ABS.

FRONT PANEL MATERIAL: Painted Aluminum.