



TECH NOTE series

Acoustics:

Identifying Reflective Surfaces

(with the Terrasonde Audio Toolbox)

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This tech note describes a procedure in which to accurately identify sources of axial (a.k.a. first order) reflections at a listening position within a room. This can be done in less than half the time of traditional methods; which usually involve data collection and post-processing. It requires the fabrication of a microphone/laser “test jig” and works very well.

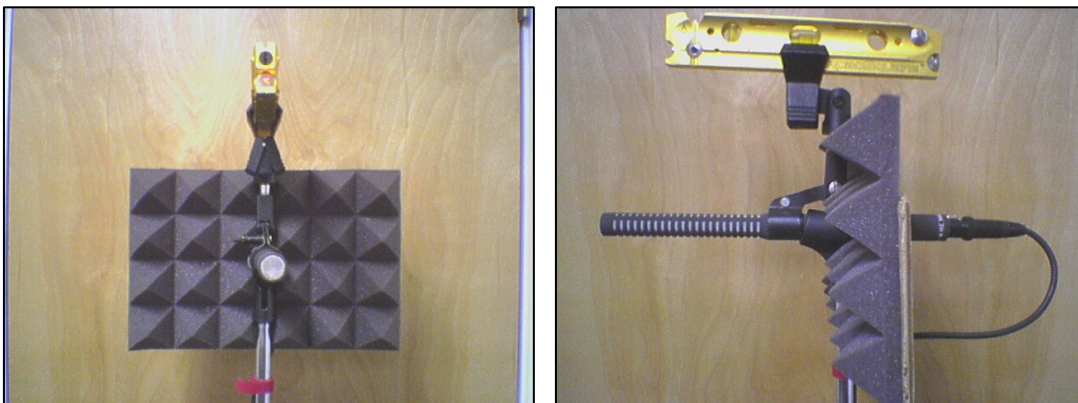
Tools Required:

- Terrasonde Audio Toolbox (with Contractor’s firmware)
- Super-directional “shotgun” type microphone (with preamp if needed)
- Laser (mounted to microphone)
- Small absorptive material (Auralex foam, Sonex, etc.)

In performing the measurement, use a steady-timed, repeating pulse centered at 4 kHz as a noise source. This allows for the reflection to be seen more clearly in the ETG display without the modal response of the room skewing the measurement. A good way to achieve this is placing an equalization filter between the ATB’s output and the loudspeaker’s amplifier; then, filter out everything except the 4 kHz octave band. You could also produce a CD with a track that can be looped.

The microphone/laser probe is placed in the listening position.

Examples of the microphone/laser test probe (McGyver would be proud!):



Preparation:

STEP 1: Set ATB to Acoustic Analysis / Energy-Time Graph

STEP 2: Set ETG _mode_ to feet (ft)

STEP 3: Set ETG _trigger_ to source. Default is external (ext). Use internal (int) if using a CD loop, starter pistol, etc.

STEP 4: Set ETG `_resolution_` to slightly larger than the room's longest dimension (i.e. if the room's longest dimension is 50', then the ETG should be set to 60)

STEP 5: Set ETG `_input_` to external (ExtL, Ext, or ExtH)

STEP 6: Set ETG `_filter_` to 4 kHz 1/3-octave band-limited (t 4k)

STEP 7: Place Microphone / Laser setup (see figure 1) at the listening position (approx. 3 – 5' from floor)

Performing the Measurement:

STEP 1: Start the ETG internal pulse source (or external source)

STEP 2: Observe the display and identify the initial direct sound and zoom in closer to it

STEP 3: Using the zoom function, adjust the display so that you can identify the first reflection after the direct sound

STEP 4: While observing the first reflection, adjust the aiming of the microphone both horizontally and vertically. You should observe a point where the reflection's amplitude reaches its highest point.

STEP 5: Turn on the laser (if it's not already on), find the dot, and place a small piece of tape (or Post-It Note) on the surface; you've now identified the source of the reflection.

Repeat this process for the next few reflections.

Once you've identified the several reflection surfaces, you now can treat them with the appropriate acoustic material; and start mixing that next grammy-winning project!