

PHY2010 HW 6.

1. Match the following acoustical concepts with their definitions

Liveness	a. First reflected sound arrives <20ms after direct
Shadows	b. Large reflected sounds which yield poor texture
Texture	c. Results from reflections off curved walls
Brilliance	d. Results from poor acoustical isolation from environment
Clarity	e. Intensity of reflected sound is high rel. to that of direct
Focusing	f. Temporal pattern of sounds; good is a smooth decay
Fullness	g. Reverb time of low end is shorter than normal
Blend	h. Physically measurable reverb time
External noise	i. Intensity of reflected sound is low rel. to that of direct
Intimacy	j. Regions with poor high end mix due to obstructions
Echoes	k. Quality of the mix of instruments throughout the audience

2. You're building a church with a "rectangular barn" sanctuary with sides 100ft × 50ft × 40ft. Choose the value closest to the "ideal" reverberation time: (Hint: You can "read" this off Figure 8-4 in the text.)

- a. 1.5 s b. 2.2 s
c. 1.0 s d. 1.9 s e. 1.7 s

3. Your home studio is 10ft x 12ft x 8ft. What are the frequencies of the five *lowest-frequency* room modes? (Use 1130 ft/s for the speed of sound.)

4. Chim E. Changa's Restaurant & Kiddie Fun Zone* features a large Romper Room which is 50 feet long, 25 feet wide and 12 feet high.

- a. The floor is made of tile ($a=0.08$) and walls and ceiling are made of plasterboard ($a=0.10$). If you also add in the absorption due to 50 children, with an absorption of 2.1 Sabins each, what is the reverb time in the Romper Room?
- b. In response to a class-action lawsuit from employees who claim hearing damage from the *deafening* reverberant noise of shrieking, bean-encrusted young'uns, the management has decided to add absorption in the form of acoustical board ($a=0.80$) on the ceiling, and curtains ($a=0.35$) along both long walls. What will the new reverberation time be?

*cf. "Kickin' It Old Skool," starring Jamie Kennedy