

IX. Human Hearing Experiments – Psycho-Acoustics:

- 1. Frequency Response of Human Ear:**
 - Measure/Map Out w/ Function Generator + Speaker - how to quantify?
- 2. Phase Shift Sensitivity of Human Ear:**
 - PC-based LabWindows/CVI DAQ - two arbitrary waveform generators driving stereo system, or headphones.
- 3. Investigation(s) of Consonance & Dissonance:**
 - Use 2 function generators, several oscilloscopes, 4-channel audio-mixer, loudspeakers to investigate consonance/dissonance – sine waves, triangle & square waves.
 - Record consonant/dissonant signals/sounds & then analyze using MatLab Wav_Analysis software.

X. Room/Auditorium Acoustics:

- 1. Measure Acoustical Resonance Properties of Room/Auditorium as function of frequency at several locations. Use e.g. White Noise FG, Power Amp & PA Speaker, Reference Mic and HP Dynamic Signal Analyzer.**
- 2. Measure T-30/T-60 Reverberation Time(s) of Room/Auditorium as function of frequency. Use Same Equipment as Above.**

XI. Ultra-Sound Experiments:

- 1. Investigate the Phenomenon of Sonoluminescence/Standing Ultra-Sound Waves in Water.**
- 2. Build An Ultrasound Transducer Array, use Non-Linear Mixing Techniques to “Beam” a Narrow-Focus Audio Signal.**