

Preface

Welcome to the first edition of *Science of Sound Laboratory Manual*, an open educational resource (OER). The goal of this work is to support the lab portion of a general college physics course that focuses on sound, acoustics and audio. It covers a variety of topics including speed of sound, resonance, loudness, basic electricity (in association with loudspeakers and microphones) and the human voice. The following equipment should be available for each lab station: General purpose physics components including mass set, spring, stopwatch, meter stick/tape measure and an L-rod (hanger); electrical test gear including a digital oscilloscope, two sine wave generators, a voltmeter capable of reading dB, a DC power supply, two dynamic microphones such as the Shure SM-58 with mic pre-amps, PVC pipe, a pair of headphones and two raw frame loudspeakers (a 4" to 6" general purpose plus an 8" to 12" woofer). A purpose-built apparatus is required for the Tensioned String exercise along with different gauges of piano wire (long scale bass guitar strings can also be used) and a guitar pickup (a removable acoustic guitar pickup works well). A BNC switch box is handy for the Loudness exercise and is relatively easy to make. The Room Modes demo makes use of an SPL meter and a subwoofer or PA loudspeaker with amplifier. Finally, a personal computer running Windows is required for the final four exercises. These exercises make use of the *Sample Wrench* free audio editor and analyzer. It is available from my web site www.dissidents.com.

I cannot say enough about the emerging Open Educational Resource movement and I encourage budding authors to consider this route. While there are (generally) no royalties to be found, having complete control over your own work (versus the "work for hire" classification of typical contracts) is not to be undervalued. Neither should contributions to the profession nor the opportunity to work with colleagues be dismissed. Given the practical aspects of the society in which we live, I am not suggesting that people "work for free". Rather, because part of the mission of institutes of higher learning is to promote and disseminate formalized instruction and information, it is incumbent on those institutions to support their faculty in said quest, whether that be in the form of sabbaticals, release time, stipends or the like.

If you have any questions regarding this lab manual or my other OER works, or are interested in contributing to these projects, do not hesitate to contact me. Finally, please be aware that the most recent versions of all of my OER texts and manuals may be found at my MVCC web site as well as my mirror site: www.dissidents.com