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Subject: Pipes, tapered pipes and Helmholtz resonators

Posted by [Wayne Parham](#) on Thu, 22 Sep 2005 17:57:19 GMT

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We've had some discussions here about bass-reflex, tuned pipes, tapered pipes and horns, specifically about their similarities and differences. So I've taken a moment to put together a list of references from authors other than those that normally contribute here.

[Acoustics and Vibration Animations](#), list of articles and demonstration by Dr. Daniel Russell

[Acoustic High-Pass, Low-Pass, and Band-Stop Filters](#), Daniel Russell discusses propagation of sound through ducts, transmission lines and acoustic filter chambers

[Superposition of Waves](#), shows the interaction of standing waves

[Radiation from a Baffled Piston](#), shows the effects of frequency on directivity

[Evanescent Modes in Waveguides](#), shows higher order modes in ducts driven above and below their cutoff frequency

[Mass-Spring Systems with Damping](#), shows how system damping affects resonance amplitude, which in turn affects response

[The Forced Harmonic Oscillator](#), shows systems driven below resonance, at resonance and above resonance

[Coupled Oscillators](#), shows two mass-spring systems, like the mechanical resonance of a loudspeaker and the acoustic resonance of the cabinet

[The Dynamic Vibration Absorber](#), shows how two tuned systems can be optimized for working together. Think speaker and box.

[Vibrational Modes of a Circular Membrane](#), shows cone flex breakup modes

[HyperPhysics - Resonance](#), several links on the subject

[HyperPhysics - Air Column Resonance](#), online calculator of open pipe, closed pipe and tapered pipe resonant modes

[HyperPhysics - Cavity Resonant Frequency](#), online calculator of Helmholtz resonant frequency

[Resonance, standing waves, & Eigentones](#), discussion of resonance and Q

[Musical Acoustics - Some Introductory Pages](#), several links about matters acoustic from the University of New South Wales

[Pipes and Harmonics](#), University of New South Wales, compares closed cylinder pipes, open cylinder pipes and closed conical pipes

[Helmholtz Resonance](#), University of New South Wales, describes Helmholtz resonance

[Sound Waves and Music](#), several online lessons from the Physics Classroom

[Resonance and Standing Waves](#), Physics Classroom

[Standing Waves and Resonance](#), describes standing waves in mechanical, electrical and acoustic transmission lines

[Resonata](#), a groovy applet

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