

Singing Tubes



Purpose: Demonstrates standing-wave resonance and beats.

Heaters cause hot air to rise in the tubes which oscillates at each tube's resonance frequency. Very dramatic! The pitch is slightly varied by adjusting the glass tube upwards or downwards. In this manner, the tubes may be tuned to produce loud beats. Positioning the tubes so that the heaters are about $1/5$ of the way from the bottom appears to produce the loudest sound.

Note: The emission of sound from the tube is brought about by the cooling effect of air rising through the heater elements. Small variations in this upward air current produce a corresponding variation in the cooling effect on the wires in the grids. Impulses are set up and, through the resonant response of the tube, reinforced until a strong sound wave is produced.

Extra Equipment Needed: None

Location: Shelf E1