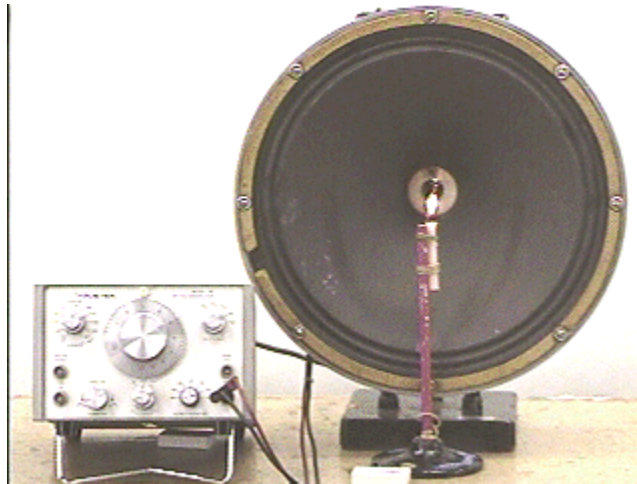


Question #242

A candle flame is positioned immediately in front of a loudspeaker, as seen in the photograph below. This view is "along the axis" of the loudspeaker.



An audio oscillator/amplifier connected to the loudspeaker is turned on at the resonant frequency of the loudspeaker, about 36 Hz, so that the loudspeaker produces a large sound wave. The input to the speaker is several watts of power, and its efficiency is over ten percent at its resonant frequency, so it is probably putting out nearly one watt of audio.

The question this week involves what the candle flame will do, if anything, when the audio input is turned up to a high level. In particular, will the flame move, and if so, how?

When the loudspeaker is operated at a large power level at its resonant frequency, the candle flame will:

- (a) oscillate in the direction along the axis of the sound wave as it leaves the speaker, forming a long bright line when viewed across the speaker axis (from left to right in the photograph above).
- (b) oscillate in the direction perpendicular to the axis of the sound wave as it leaves the speaker, forming a long bright line when viewed looking toward the speaker along its axis (the view in the picture above).
- (c) oscillate in both directions, forming a large bright region when viewed from any direction.
- (d) not move at all, because of the nature of the sound wave.

Click here for [Answer #242](#) after February 20, 2006.

[Question of the Week](#)

[Outreach Index Page](#)

[Lecture-Demonstration Home Page](#)



For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).