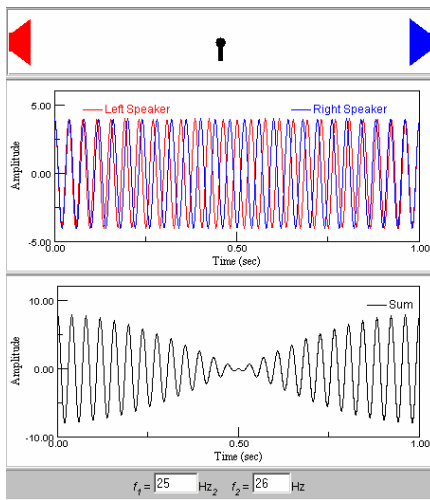


Worksheet for Exploration 18.3: A Microphone between Two Loudspeakers



A microphone is placed between two loudspeakers (**position is given in centimeters and time is given in seconds**). The speakers are connected to two sources of sound that have variable frequencies, f_1 and f_2 . The graph shows the sound waves arriving at the microphone, as a function of time, from each speaker and also shows the sum of the two waves. Change the frequency of either sound source ($25 \text{ Hz} < f_1, f_2 < 30 \text{ Hz}$), and watch the changing interference between the two sound waves. Study the phenomenon of beats and verify that the beat frequency is correct. [Restart](#).

- What happens as the two frequencies get closer together?
- What happens as the two frequencies get farther apart?
- Does it matter which speaker has the higher frequency?
- What happens if the two frequencies are identical?
 - Consider what the implications are for the phases of the two speakers must be to give the result that you observe.

Remember that it is the **difference** between the two sound frequencies that determines the beat frequency.