

CHAPTER OVERVIEW

3.9: The Ear and Perception

According to what we have learned so far, the fundamental frequency of vibrations in the air is the biggest factor in determining the perceived pitch of a note and the energy per second per square meter (intensity) determines how loud the sound is. We also know that our perceptions do not perfectly match frequencies and intensities measured by laboratory instruments. In this chapter we look at how the ear turns vibrations into the perception of sound. Some of the exact details of this process are still not completely understood but the general picture of how we hear is fairly well established. Once again we will see that the human hearing mechanism gives us experiences that do not correspond exactly to laboratory measurements.

Key Terms:

Pinna, middle ear, inner ear, cochlea, timpanic membrane, ossicles, cochlea, semicircular canals, vestibular nerve, auditory nerve, inner hair cells, outer hair cells, place theory of hearing, timing theory of hearing, missing fundamental, auditory illusions, attack frequencies, critical bands, conductive hearing loss, otoacoustic emission, sensorineural hearing loss, presbycusis.

3.9.1: The Ear and Perception

3.9.1.1: Structure of the Ear

3.9.1.2: The Place Theory of Hearing

3.9.1.3: The Temporal Theory of Hearing

3.9.1.4: Hearing Loss

3.9.1.5: The Missing Fundamental

3.9.1.6: Missing Fundamental Simulation

3.9.2: Beats

3.9.2.1: Other Combination Tones

3.9.2.2: Beats and Critical Bands Simulation

3.9.2.3: Other Interesting Auditory Phenomena

3.9.2.4: Animal Hearing

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