

# HOW TO READ AN AUDIOGRAM

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The audiogram (or hearing test) is really just a graph of an individual's hearing. It shows how much intensity (or loudness) it takes for that person to hear each frequency (or pitch). Frequency is expressed in cycles per second, or more commonly, Hertz (Hz).

The human ear is responsive to frequencies ranging from 20 to 20,000 cycles per second. On industrial audiograms, 6 frequencies are usually tested: 500Hz, 1000Hz, 2000Hz, 3000Hz, 4000Hz, and 6000Hz. If you look on the audiogram graph, you will see the frequencies across the graph horizontally, from the lowest "pitch" (500 Hz) to the highest "pitch" (6000Hz or 8000Hz).

The decibel range tested on most audiograms is from 0dB to 90 or 100dB. Some audiograms will show a low range of -5 or -10, and go to 110dB. The decibel range goes down the graph vertically. The higher the numerical decibel reading at each frequency the more sound is needed for that person to be able to barely perceive that sound.

If the readings (or thresholds) tend to be fairly flat or horizontal all the way across the graph, this means that the person hears most sounds fairly evenly, although there may be some hearing loss present. If there appears to be a more sloping type of curve -- like a ski slope -- then the person hears sounds unevenly, ie: some better than others. Most people with hearing losses usually hear low frequency (pitch) sounds better than high frequency sounds.

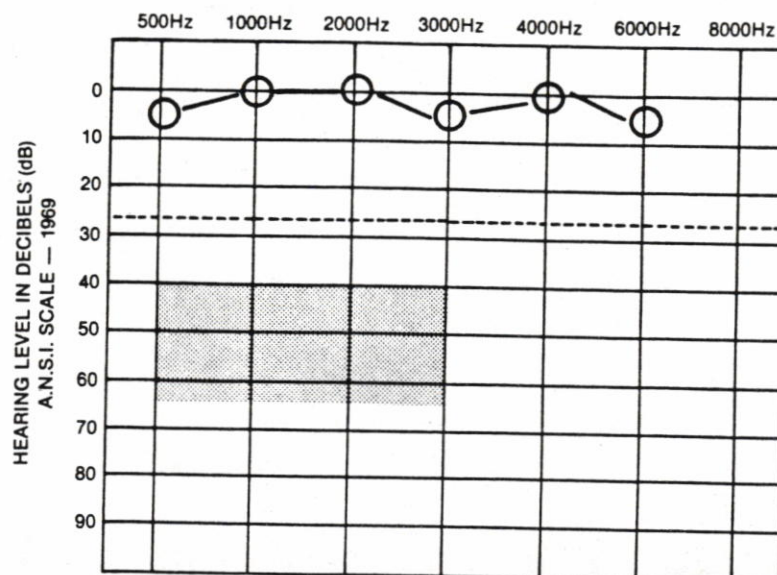
Speech is composed of many frequencies, but the ones that appear to be most important are those from 500Hz to 3000Hz. Studies done with people with hearing losses have shown that when hearing loss occurs in this area, the person will begin to notice difficulty in communication.

The sounds most affected by noise exposure over a long period of time are the higher frequencies -- 3000Hz, 4000Hz and 6000Hz. A "typical" noise induced hearing loss begins by showing a hearing loss at 4000Hz, with the other frequencies within the normal range. As the hearing loss progresses, the frequencies adjacent to 4000Hz are also affected.

Vowels tend to be low frequency sounds (easy to hear, but they do not give us very much information); and consonants tend to be high frequency sounds (harder to hear -- less power -- but without them, it is difficult to understand speech). This is partly the reason that a person with a high frequency hearing loss may have trouble distinguishing what is being said, especially if there is a large amount of background noise.

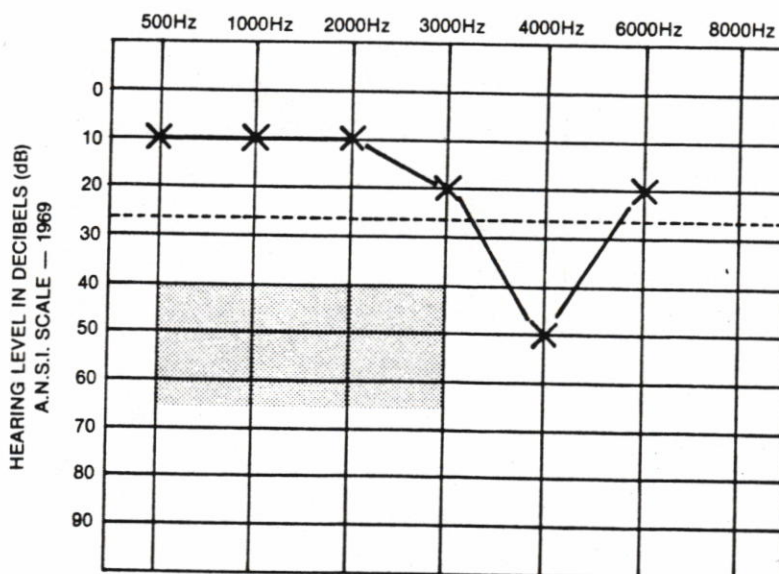
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# EXAMPLES OF TYPICAL AUDIOGRAMS



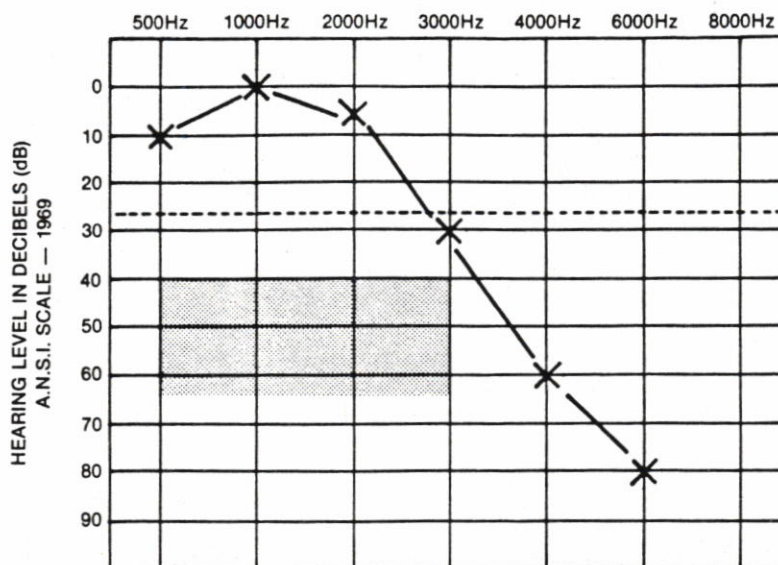
**HEARING WITHIN THE NORMAL RANGE:** Able to hear most sounds and speech under most conditions.

O = right ear

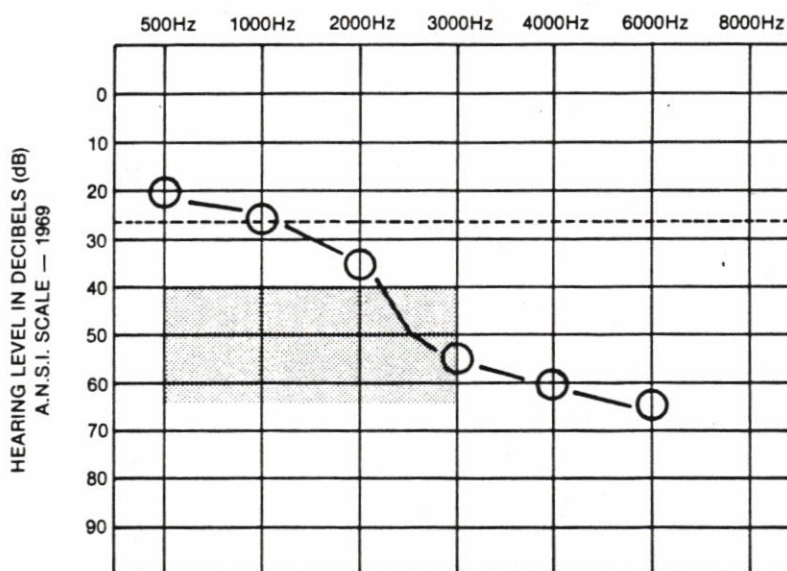


**TYPICAL NOISE INDUCED HEARING LOSS:** This is an example of a "typical" beginning of a noise-induced hearing loss. Generally, most people are not aware of any hearing loss at this time. The high frequency "notch" at 4000Hz indicates hearing quite good thru much of the speech range, with a drop at 4000Hz. The hearing thresholds improve again at 6000Hz.

X = left ear

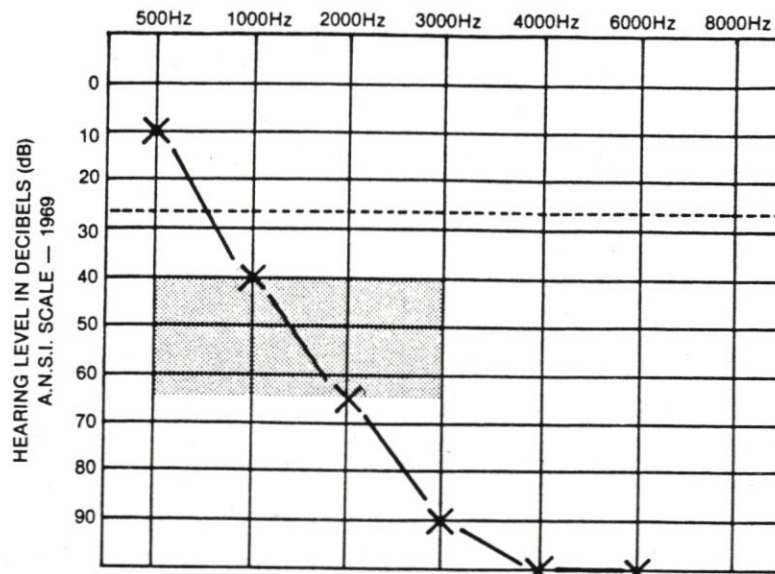


**MILD HIGH FREQUENCY HEARING LOSS:** Person may have some problems hearing speech with the presence of background noise. Usually few difficulties in hearing and understanding under quiet conditions and with small groups of people. Certain environmental sounds, such as crickets, some bells, watch ticks, etc., may not be heard. The phone is not normally a problem. Tinnitus, or ringing in the ears may be present.

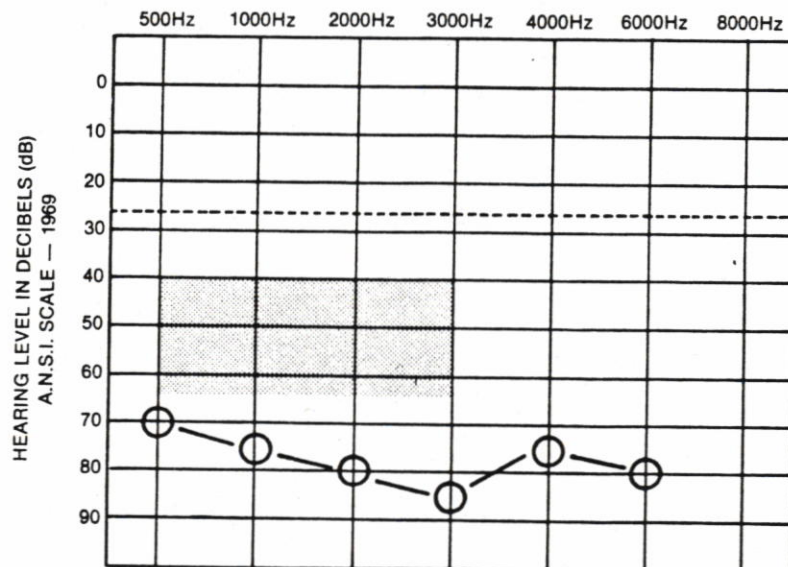


**MODERATE LOSS:** Has trouble hearing speech, unless there are good listening conditions. Hearing over the telephone may be difficult. Does not hear some environmental sounds at all. May have tinnitus. Should wear hearing aid, possibly 2 aids if loss is fairly equal in both ears.





**MODERATE TO SEVERE HEARING LOSS:** Has trouble hearing loud speech, even under good listening conditions. Hearing over the telephone may always be difficult. Does not hear many environmental sounds. May have tinnitus. Should wear hearing aid, possibly 2 aids if loss is fairly equal in both ears.



**SEVERE HEARING LOSS:** Has great difficulty in all communications. Should be referred for medical examination if diagnosis has not been made and should wear hearing aid.