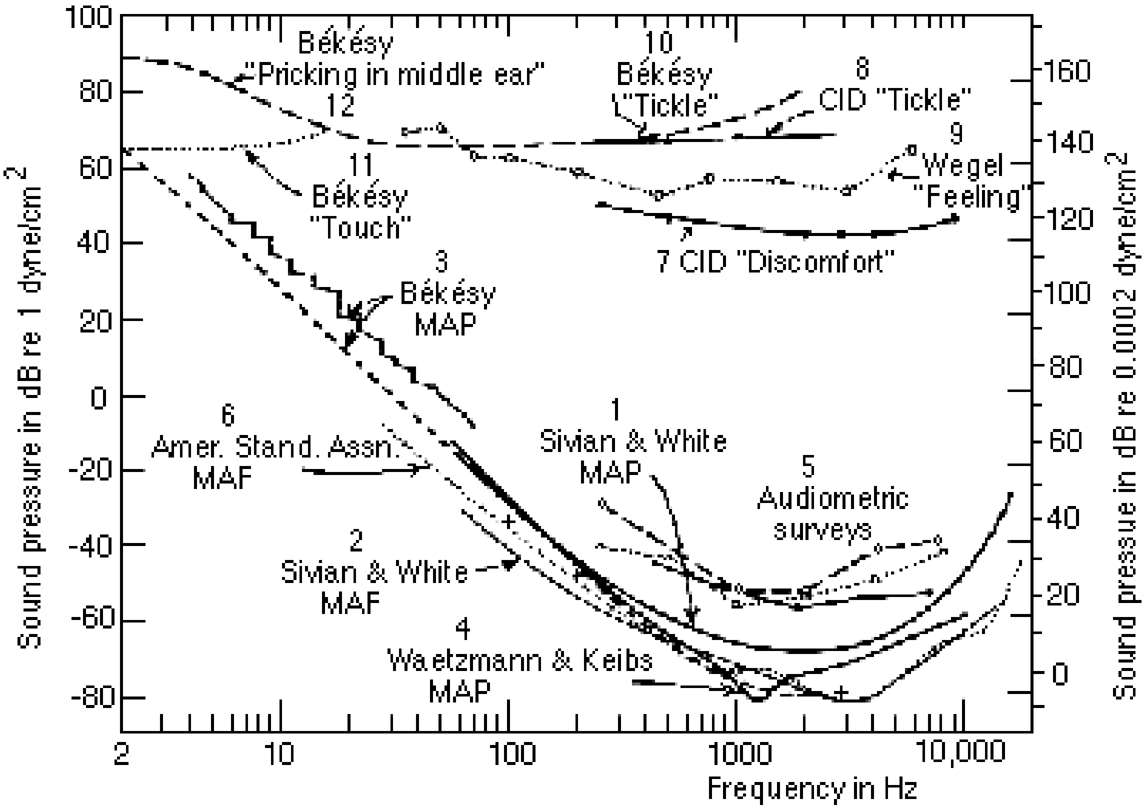

The so-called minimum audible pressure (MAP) (*aka* the reference pressure), is defined at f = 1 *KHz* and is:

$$p_{o\,rms}\left(f = 1\,KHz\right) \simeq 2\times 10^{-5}\ RMS\ Newtons/m^2 = 2\times 10^{-5}\ RMS\ Pascals$$

In the above figure, note that the ***dyne*** is a *cgs* (*cm-gm-sec*) unit of force, hence the SI/*mks* ⇔ *cgs* units conversion factor: 1 *Newton* = 10^5 *dynes*.

Recalling that $p_{atm} \simeq 10^5\,Pascals$, we see that humans are able to hear/detect pressure variations of order ~ 1 part in 10^{10} of atmospheric pressure!!!

The corresponding minimum audible longitudinal particle velocity $u_{o\,rms}$ (*aka* the reference particle velocity) and minimum audible longitudinal particle displacement $\xi_{o\,rms}$ (*aka* the reference particle displacement) at f = 1 *KHz* are:

$$u_{o\,rms}\left(f = 1\,KHz\right) \simeq 4.8\times 10^{-8}\ RMS\ m/s \quad \text{and:} \quad \xi_{o\,rms}\left(f = 1\,KHz\right) \simeq 7.7\times 10^{-12}\,RMS\ m$$

The latter should be compared *e.g.* with size of an atom, which is typically on the order of a few Angstroms, *i.e.* $d_{atom} \sim few\times 10^{-10}\,m \gg \xi_{o\,rms} \sim 8\times 10^{-12}\,m$, a factor of ~ 100× !!!