The human ear/brain is capable of perceiving a ***fundamental*** even when ***no*** fundamental is actually present!!! This is the so-called ***missing fundamental effect***.

This effect is {again} a consequence of the non-linear response in/inside the human ear itself, and/or a non-linear response(s) in the human brain's ***processing*** of frequency information – whenever *e.g.* a ***quadratic*** non-linear response exists (in any system), if two signals *A* and *B* with frequencies f_A and f_B are input to that system, then sum and difference frequencies ($f_A + f_B$) and $|f_A - f_B|$ are produced! Thus, *e.g.* a 2nd harmonic $2f_1$ and a 3rd harmonic $3f_1$ can produce a "missing" fundamental from the difference frequency, $|3f_1 - 2f_1| = f_1$!!! For further details on distortion, read Physics 406 Lecture Notes on "Theory of Distortion I & II".

For some musical instruments – *e.g.* the trumpet, the oboe and/or the bassoon – the 2nd (or even 3rd and higher) harmonics can actually have a ***larger*** amplitude than that of the fundamental, however we perceive/hear the "note" that is played on the trumpet (and/or oboe, bassoon) as that of the fundamental!!!

The harmonic spectra – *aka* power spectral density functions $S_{pp}(f)\,vs.\,f$ and associated {time-averaged} relative phase harmonic phasor plots are shown below – *e.g.* for the steadily-played notes *A*4 (440.0 *Hz*) played on the oboe, and *F2* (87.3 *Hz*) played on the bassoon: