* Sound periods are measured in seconds, symbolized by the letter (T). The inverse of the period (t) is called Frequency.
* Frequency is the number of complete cycles (complete periods) a sound wave can propagate in a given amount of time. Frequency is measured in “cycles-per-second”, called Hertz, or (Hz).
* Wavelength is the term to describe the distance from a starting point of a wave, to the same point of the next wave. It is expressed by the Greek word “Lambda”, or “L”. This is a physical representation of amplitude versus time at a given instant.
* Phase is defined as how far along in its cycle a given waveform is.
* The pitch of a sound refers to whether it is perceived as high, like the sound of a violin, or low, like the sound of a cello or bass drum. Pitch is determined by frequency.
* Humans can hear Hz in a range from 20hz – 20,000hz. Above 20,000hz is referred to as ultrasonic, and frequencies below 20hz are referred to as infrasonic.
* The initial vibration of a sound is called the fundamental or the fundamental frequency. In a purely physics-based sense, the fundamental is the lowest pitch of a sound, and holds mostly true. Additionally, the fundamental frequency is the strongest pitch we hear.
* The decibel equal to one-tenth of a “bel”, a measuring unit named after alexander graham bell.
* Dbu: a voltage reference point. Originally designated as dBv. Reference pint is .775Vrms. Uses a 20 log equation.
* dBV: a different voltage reference point. Reference point is 1.000V rms
* dBm: an electrical power reference point, referenced to 1m@ into a 600-ohm load.
* dBW: an electrical power reference point, referenced to 1W
* dBr: an arbitrary reference level, which must be specified.
* dBFS: a voltage reference used when specifying digital audio converters, “FS” stands for “full scale,” which refers to the maximum voltage level possible before digital overload of the converter.
* dBPWL: an acoustic power reference point, rarely used.
* dBSPL: an acoustic pressure reference po9int, frequently used. Sound pressure is measured per unit area in a given location; measured in dynes per cm^2, or newtons per m^2. However, a 20 log equation is used.
* The human ear is a nonlinear device, that is, input and output amplitudes don’t necessarily have the same ration at all signal levels (that would be a linear device), and thus, it introduces harmonic distortion, usually when it is subjected to sound waves above a specific loudness.
* Harmonic distortion is the production of harmonics that do not exist in the original signal.
* Fletcher & munson are two researchers from the 1930’s, and were the first the measure and publish a set of curves showing the ear’s sensitivity to loudness versus frequency.
* The ear is most sensitive to sounds in the 3khz to 4 khz area; thus frequencies above and below 3-4 khz must be somewhat louder in order to be perceived as loud, called the Fletcher-Munson equal-loudness contours.
* Beats- two tones separated only slightly (30 khz or so), and have approximately the same amplitude will produce beats, literally; pulses alternating between two frequencies.
* Combination tones – the sound two loud tones, that differ by more than 50 hz, will be intepereted by the ear as a complex set of tones, including the two originals, and an additional set of tones that are equalto the sum and difference of the two original tones.
* Masking- the phenomenon which prevents the ear from hearing softer sounds underneath loud tones.
* Binaural localization- the ability to use our two ears to determine from where a sound source appears
* Inter-aural intensity differences- middle and high frequency sounds originating from the human’s left side will reach the left ear at a higher intensity level than the right ear, causing a difference in intensities at each ear.
* Inter-aural arrive-time differences- while inter-aural intensity differences are one clue in determining a sound’s point-source for mid-to high-frequency sounds, low frequencies, with their large wavelengths, are not as easily discriminated using inter-aural intensity differences. At lower frequencies, instead, the ear uses time delay—the short, but significant delay between the left and right ears, to calculate which sound arrived first.
* Pinnae of the ears- while inter0aural intensity and arrive-time differences gives us lateral cues, telling us left-to-right information, the pinnae, however, use the shape of the ears and the strange bumps and ridges to reflect the sound into the ear.