HELMSIDE ACOUSTICS
88 Bleaswood Road, Oxenholme, Kendal, Cumbria LA9 7EZ UK
tel/fax: +44 (0)1539 735893 e-mail: info@helmside-acoustics.co.uk

Technical Terms

You may have heard some of these terms and wondered "what does that mean?"
Hopefully you can find the answer here.

Decibel (dB)
A means of expressing sound pressure level as a ratio of the measured level to a reference level (almost always $2x10^{-5}Pa$) in Pascals
Sound Pressure Level in dB is: $20x\log_{10}(P/P_{ref})$.

Frequency Weighting
Human hearing does not respond equally to different frequencies of sound.
That is to say, a low frequency bass tone would sound subjectively quieter than a high frequency tone played at the same sound pressure level.

Sound level meters and other instruments can filter the signal to approximately mimic this characteristic of human hearing when the circumstances dictate.
Measurements taken with the filters switched on are labelled **dBA or dB(A)**.
It doesn't stop there though - the frequency response of the human ear shifts as the overall sound pressure level increases or decreases.
To take account of these different frequency responses, different filters were devised. So you may see **dB(B)** or **dB(C)** measurements, just different weightings applied to the measurements.

$L_{eq,T}$ (dB)
The equivalent continuous sound pressure level (in decibels). The continuous sound pressure level, over a time period T, which is equivalent in energy to a varying sound pressure level measured over the same time period. This measurement can be frequency weighted, so you may see an additional label in the figure.
E.g. an A-weighted L_{eq} measurement of 55 decibels, taken over a five minute period, and expressed in decibels will be written:

$$L_{Aeq,\ 5min} = 55dB.$$

Or the "A" may appear somewhere else: $L_{eq,\ 5min} = 55dBA$. Just to keep you on your toes!

L_{90}, L_{10}, etc
$L_{90,T}$ is a simple statistic related to the sound pressure level measured over a time period, T. It is the sound pressure level which is exceeded for 90% of the measurement period. Similarly $L_{10,T}$ is the level exceeded for 10% of the measurement period. $L_{90,T}$ is often used as a representation of background noise level. And, of course, if it's an A-weighted measurement, the "A" can appear here: $L_{A90,T}$.

HELMSIDE ACOUSTICS
88 Bleaswood Road, Oxenholme, Kendal, Cumbria LA9 7EZ UK
tel/fax: +44 (0)1539 735893 e-mail: info@helmside-acoustics.co.uk

Technical Terms – continued.

Octave frequency bands

The frequency range of human hearing nominally spans from 20Hz (Hertz, or cycles per second) to 20,000Hz (20kHz). Measurements can be made which just record the result of the overall sound level, but to obtain a more detailed view of the sound spectrum the frequency range is split into sub-ranges called octave bands, so that when a measurement of sound is made, the contribution to the overall level from different frequency ranges can be seen. An octave is defined as the ratio of 2:1, hence one octave band centre frequency is double the frequency of the previous and half the frequency of the next.

The octave frequency bands are:

OBCF (Hz)	Upper and Lower frequencies (Hz)
	45
63.5	
	90
125	
	177
250	
	354
500	
	707
1000	
	1414
2000	
	2828
4000	
	5657
8000	
	11314
16000	
	22627

The octave band centre frequencies are listed in the left-hand column of the table. The frequencies which are at the upper and lower limits of a particular band are to be found in the right-hand column. E.g. The octave band centred on 500Hz covers the frequency range from 354Hz to 707Hz. The octave band centred on 1000Hz covers the frequency range from 707Hz to 1414Hz.