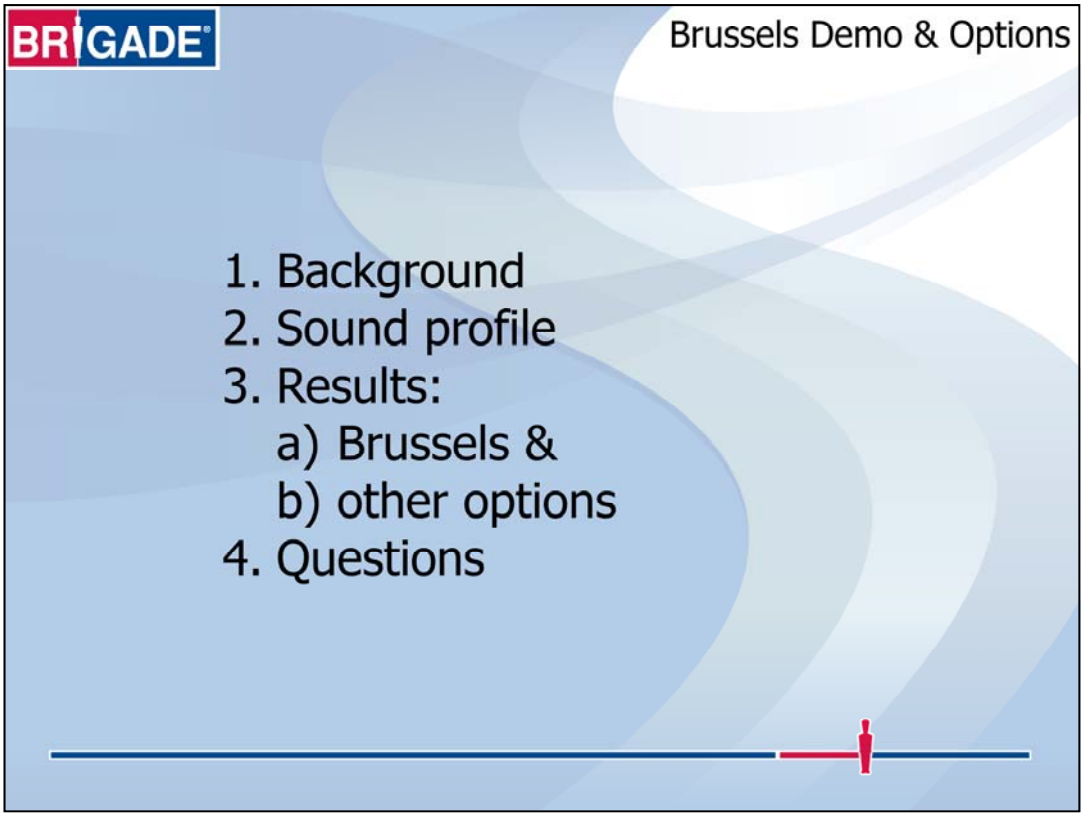
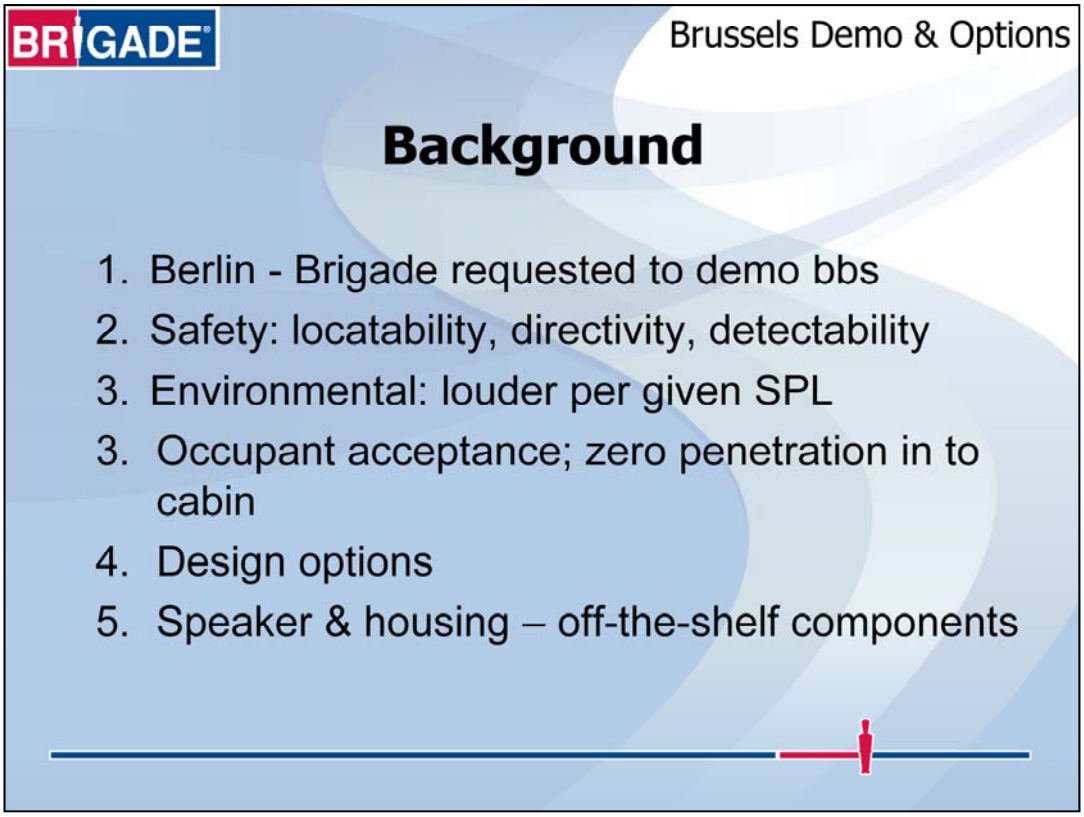
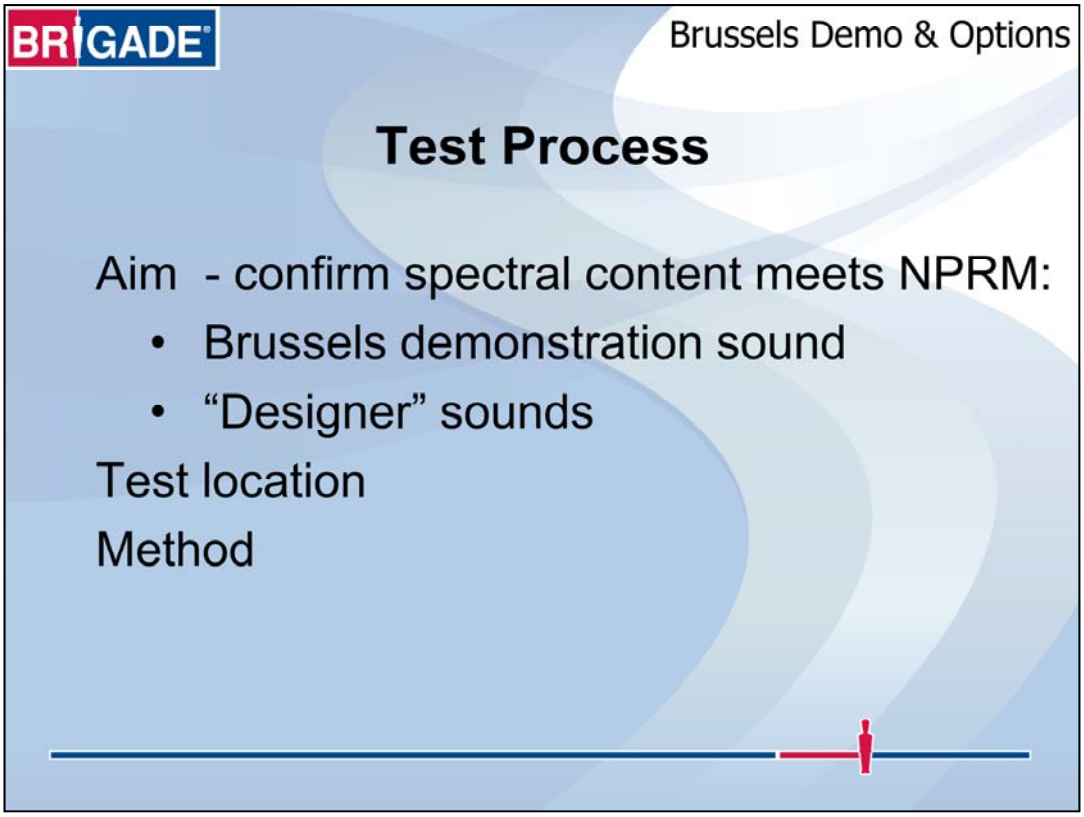

BRIGADE
Brussels Demo & Options
1. Background
2. Sound profile
3. Results:
a) Brussels &
b) other options
4. Questions



1. At the Berlin QRTV IWG meeting last Dec Brigade requested to demo bbs. With little time we focused on key:
2. Safety requirements; locatable sound & directivity with minimum
3. Environmental impact; sound that is louder for equal SPL. Also key is
3. Driver acceptance; ensuring minimal sound penetration in to cabin.
4. Design options for basic Brigade sound that allows sound to be tailored by model
5. Speaker & housing based on existing readily available components, not specifically developed for optimum performance

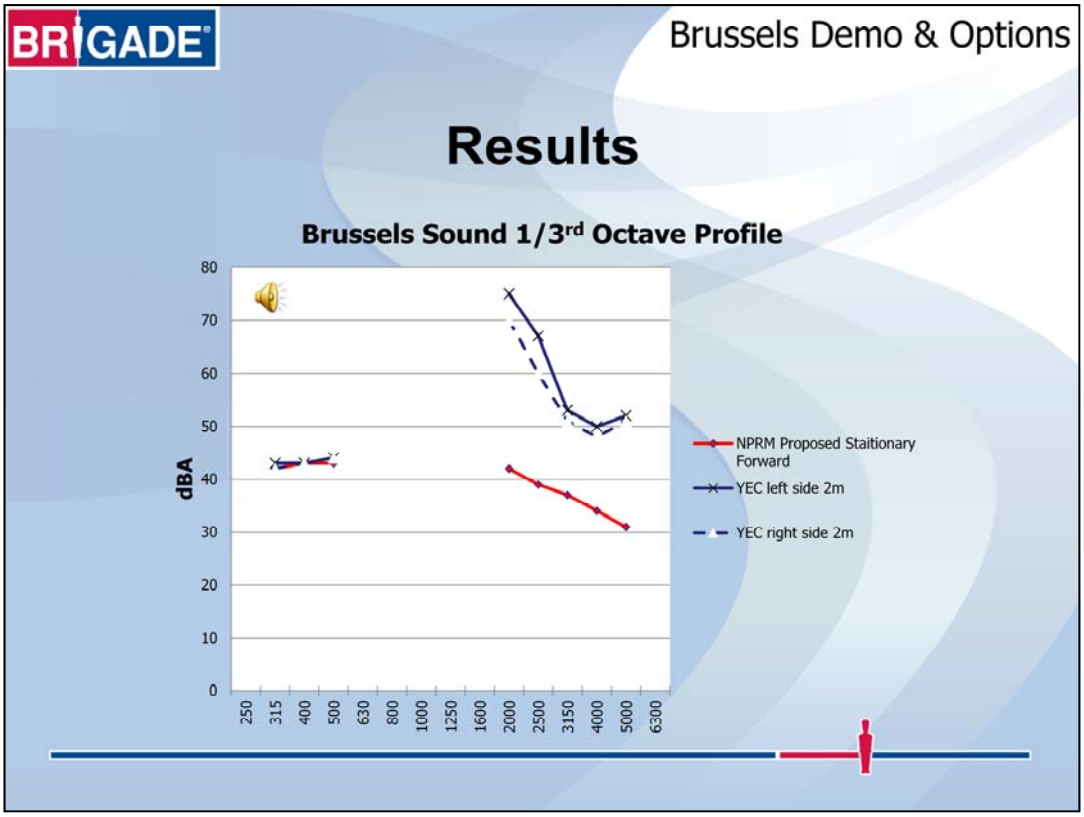
Note; due to time constraints the Brigade sound did not include pitch shifting



Testing was done at Brigade premises, quiet open space after hours

To ensure the results were not affected by ambient noise, the sounder's SPL was increased to 10 dBA over ambient. The 1/3rd octave readings were then adjusted by an amount equal to the NPRM pass level. This result was less than 2 dB above the SPL demonstrated in Brussels.

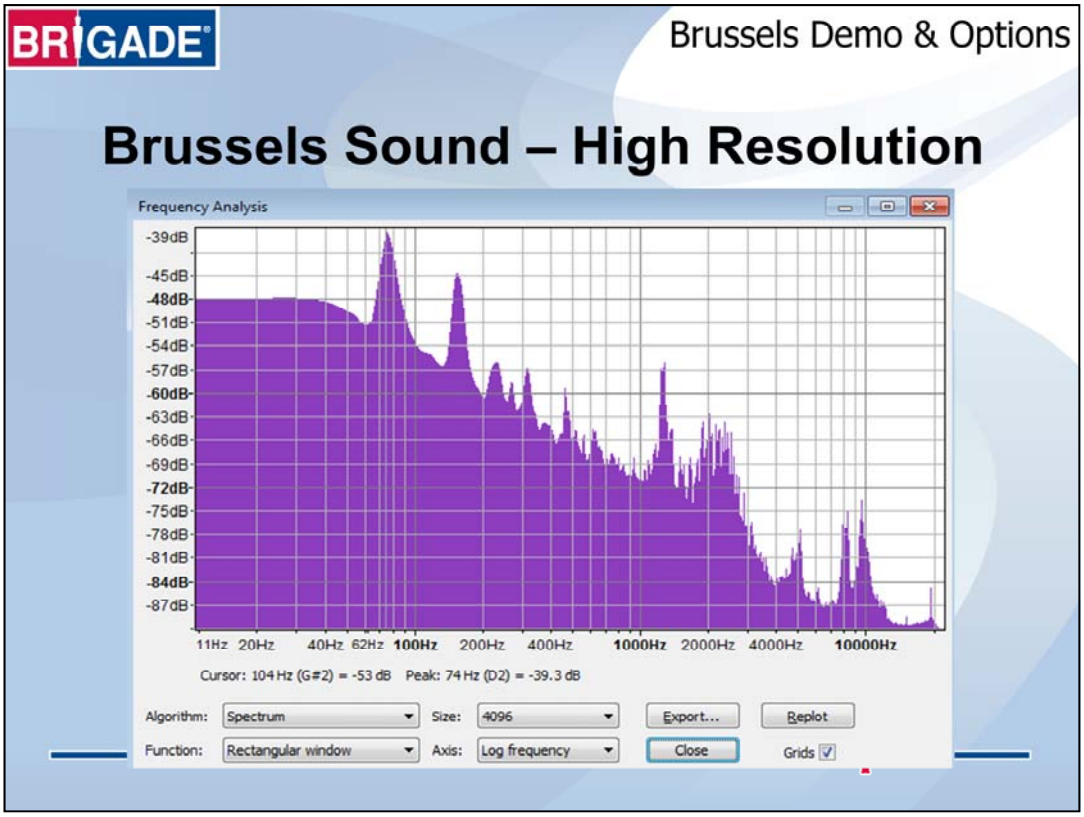
This method demonstrates that the Brigade sound meets the NPRM.



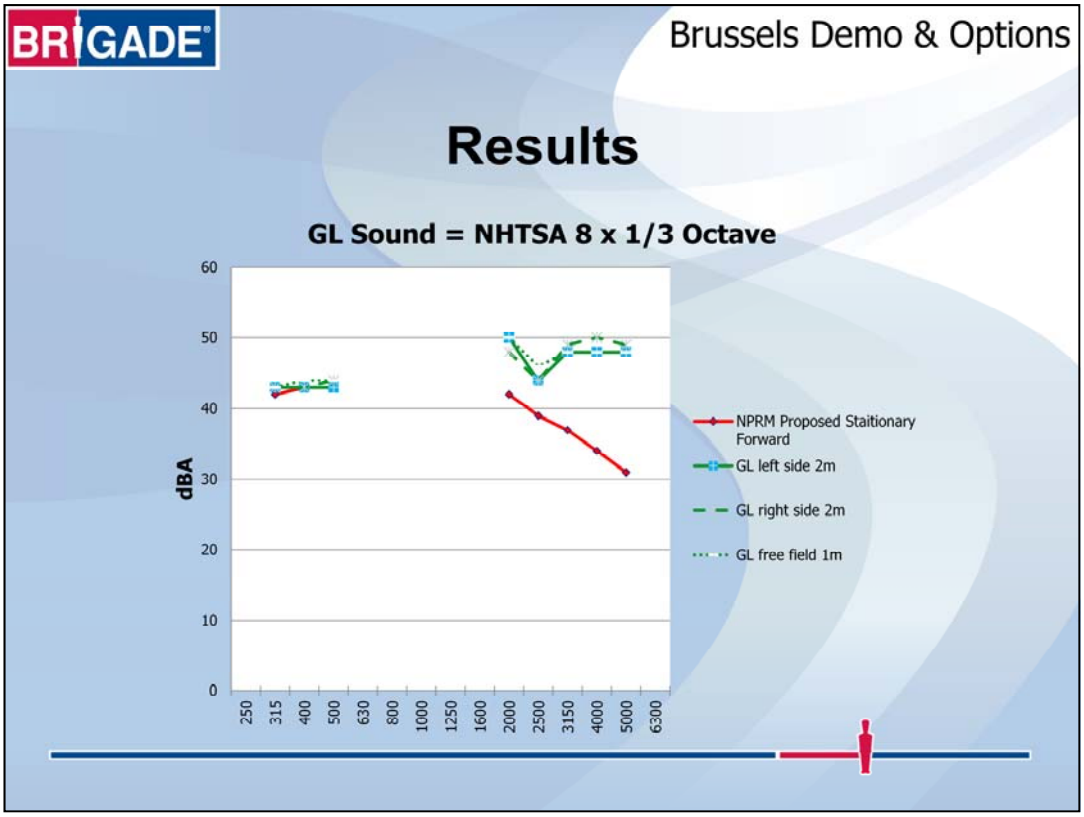
Given the time constraints a readily available backup alarm speaker was selected. A better low frequency response would have given a more even frequency profile.

Comments during and after the demonstration were:

1) An effective warning
2) Inaudible in the cabin
3) Excellent directivity
4) Readily locatable/detectable
5) Acceptable to bystanders

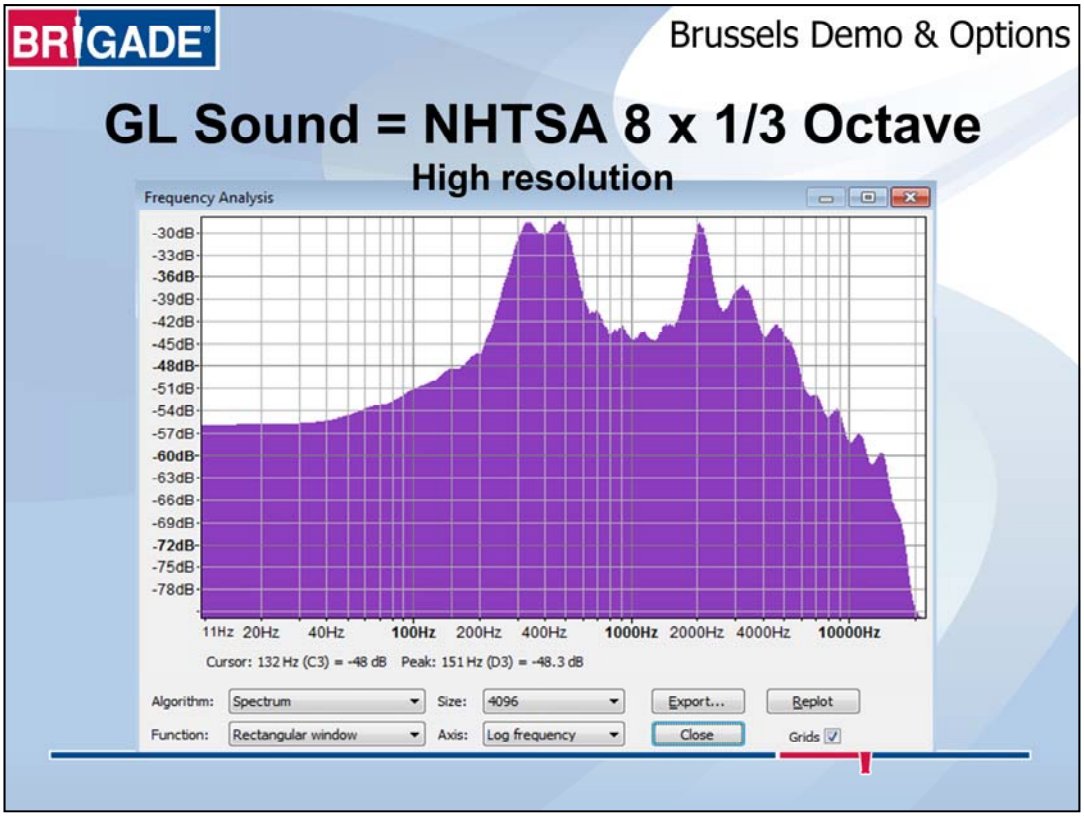


High resolution of the Brussels sounder

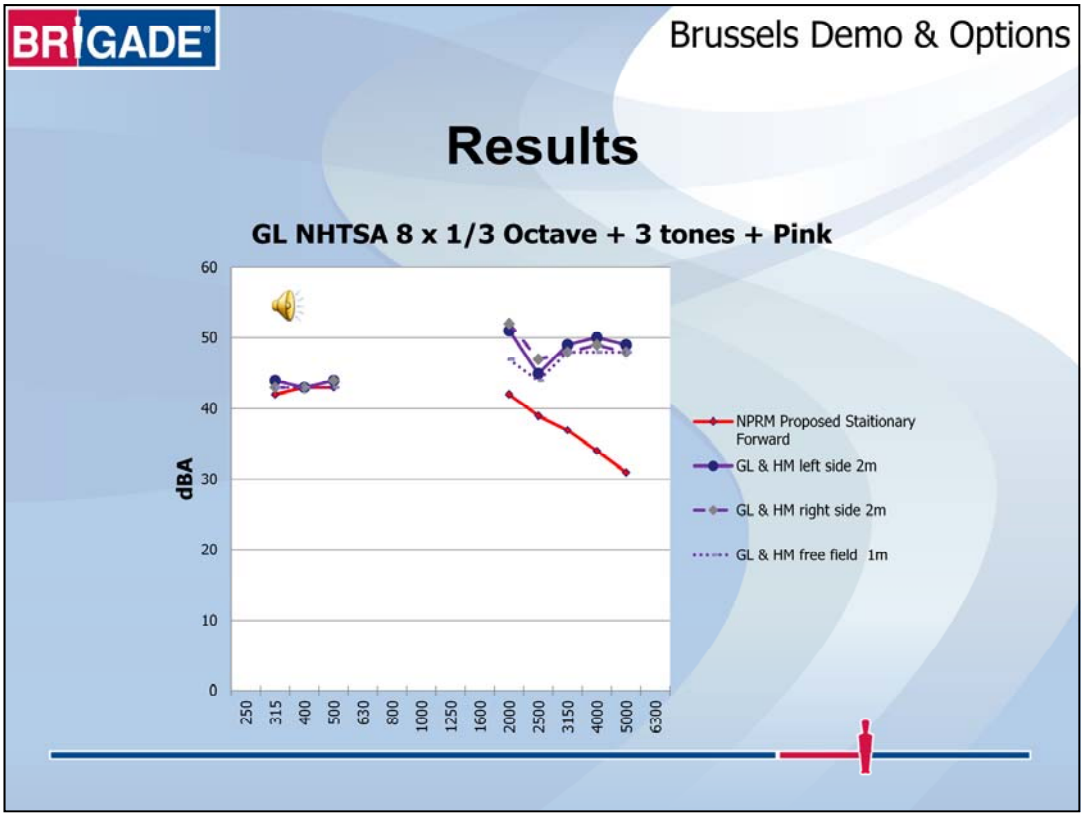


Designer sound made by Prof. Geoff Leventhall (GL Sound); a broadband sound with only NPRM 8 x 1/3rd octave bands

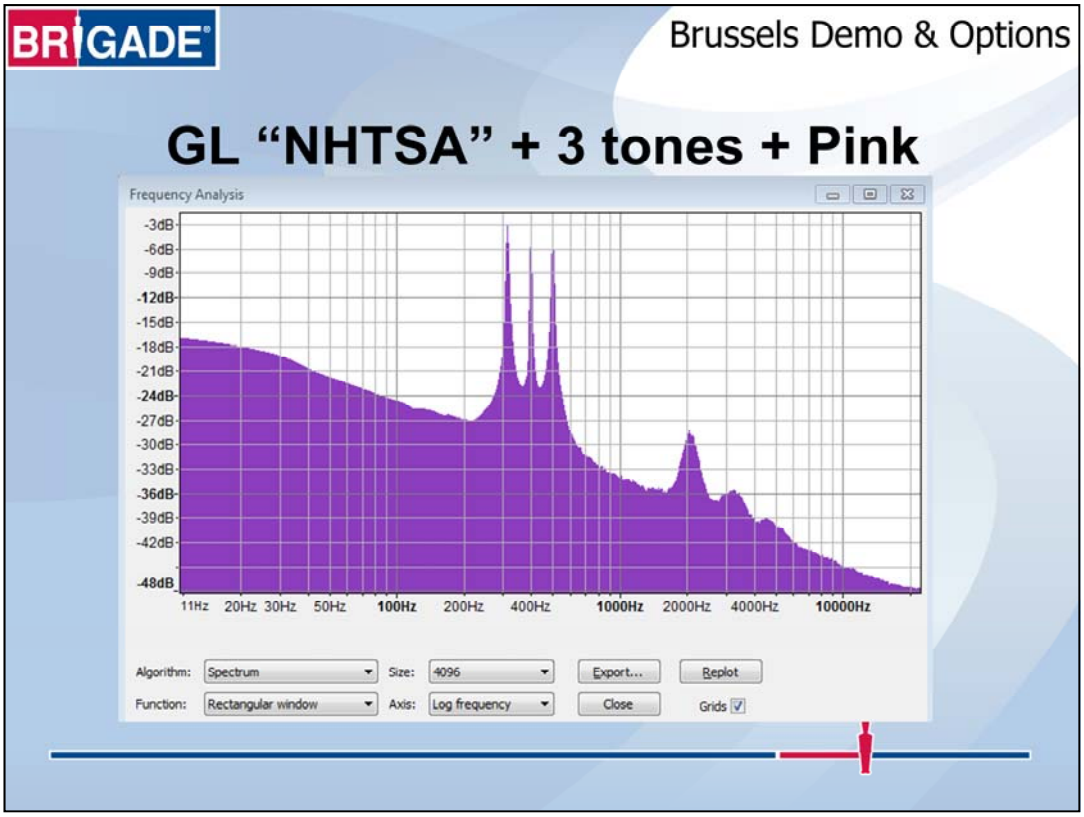
Good frequency distribution even with low frequency response speaker



High frequency resolution of Prof. Geoff Leventhall's sound



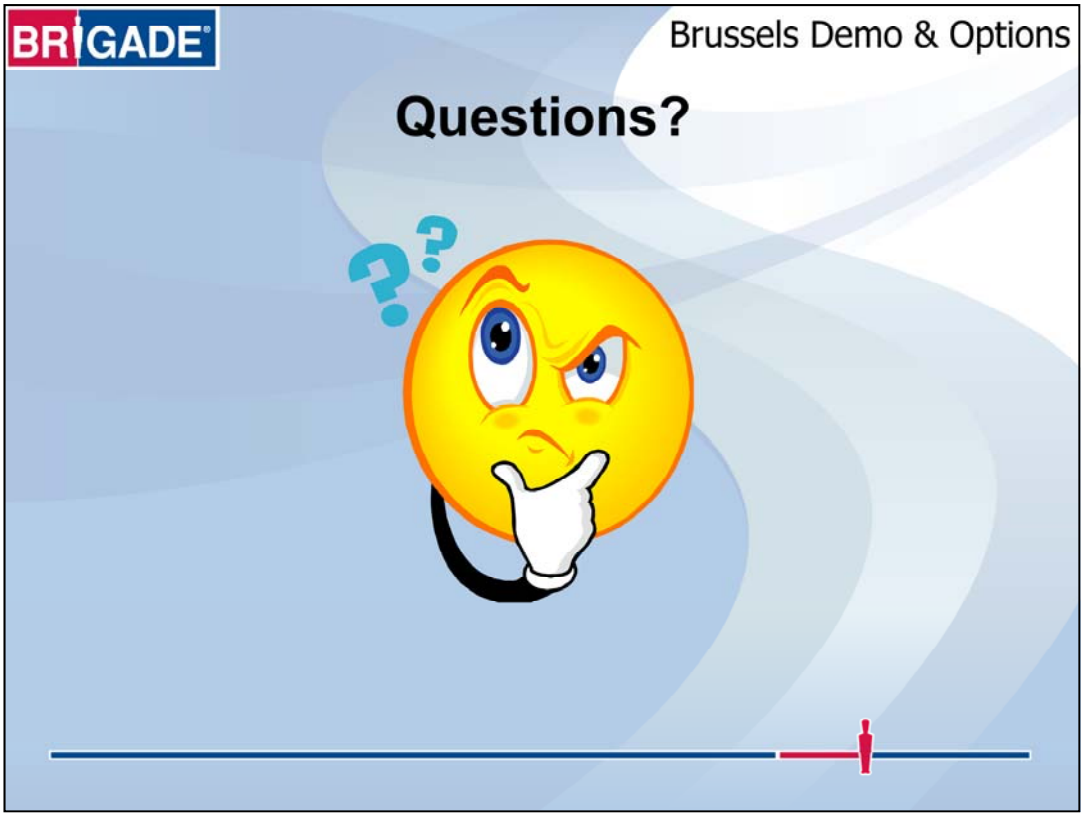
Prof. Geoff Leventhall's sound plus; pink sound & 3 tones at 315, 400 & 500 Hz



High resolution of above composite sound.

Summary

1. NPRM requirements achieved
2. Safest frequency spectrums for locatability, directivity, detectability
3. Best frequency spectrum for attenuation, vehicle occupants and community
4. Scope for designer sound


BRIGADE
Brussels Demo & Options
Questions?