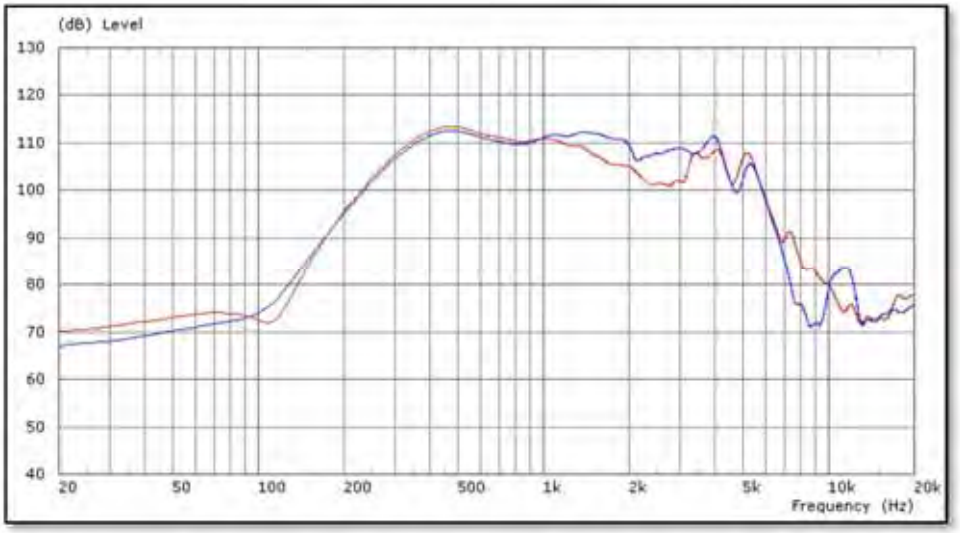
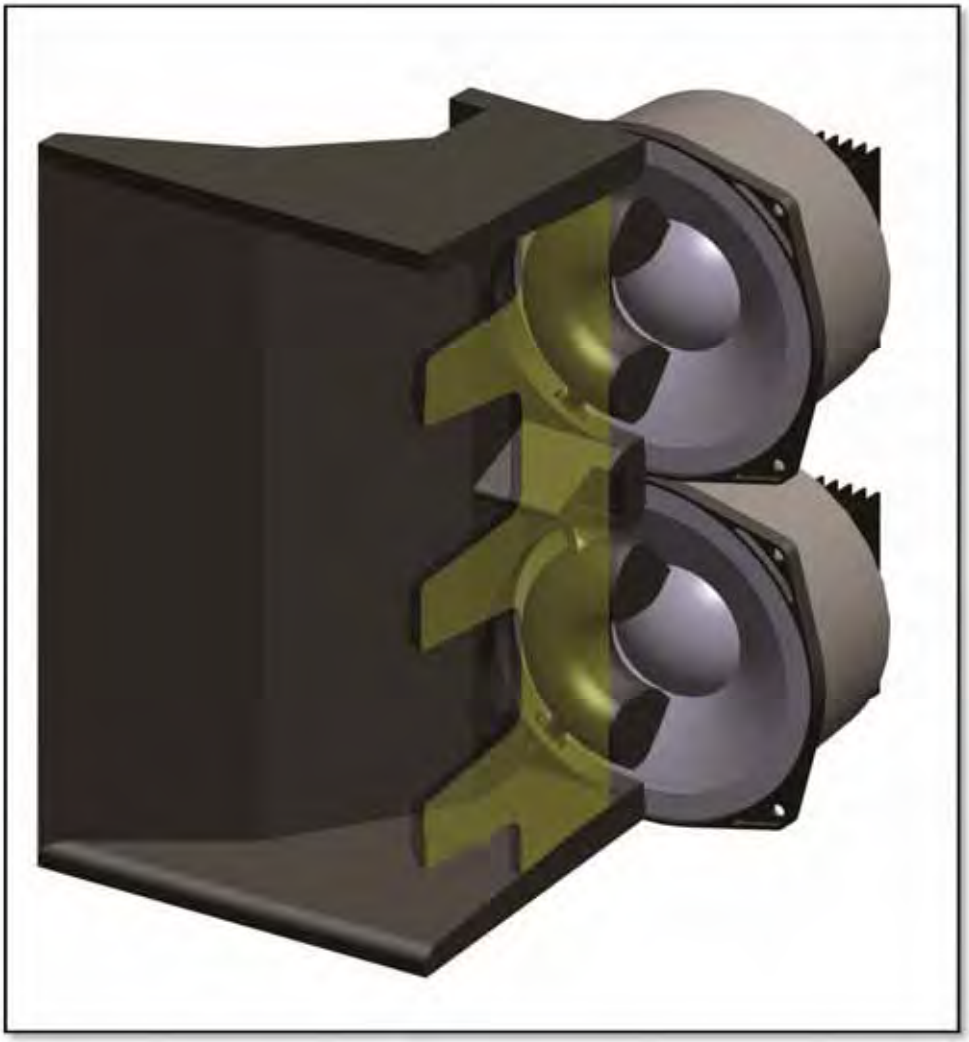
Mid-Range

With so much design effort concentrated on the vertical performance of arrays, the horizontal dispersion can sometimes suffer – particularly in designs that use coaxial, co-entrant or cross-firing midrange arrangements. MLA has completely separate mid and HF horns and the horizontal off-axis response tracks the on-axis response exactly. Martin Audio has 30 years' experience developing cone-driven midrange horns, and this experience, together with BEM optimised horn geometry has been put to good use in the design of the MLA midrange section.

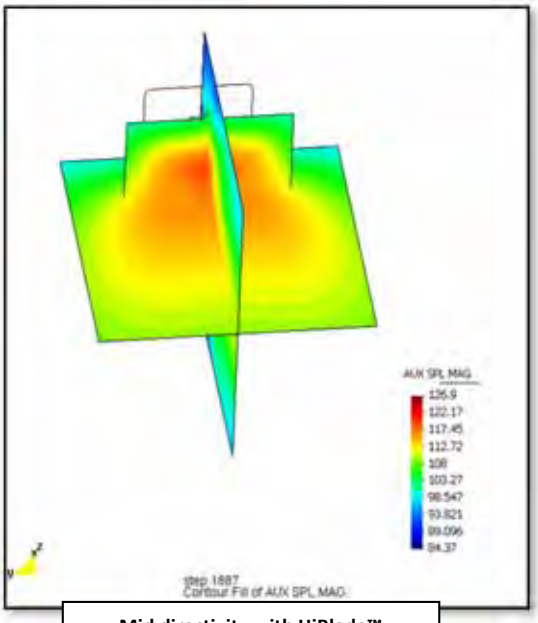
The mid horn of the MLA utilises 2 x 6.5"(165mm)/2"(50mm) voice coil neodymium drivers to produce 112dB @ 1m/2.83V - a huge gain on the typical efficiency of 102dB for cross-firing direct radiator designs. This is a result of painstaking acoustic and thermal design, utilising forced-air cooling and a thermally-conductive aluminium housing.

Generally, adding a horn to a cone loudspeaker increases its acoustic output in a non-uniform manner - with the greatest output in the lower part of the horn's operating band and output tailing off toward that of the cone itself at the upper end of the pass-band. In MLA's midrange horn, a patented*, toroidal phase-bung is placed between the driver cone and the throat of the horn. This counteracts the tendency of the horn's frequency and energy response to tilt downwards as the frequency rises.

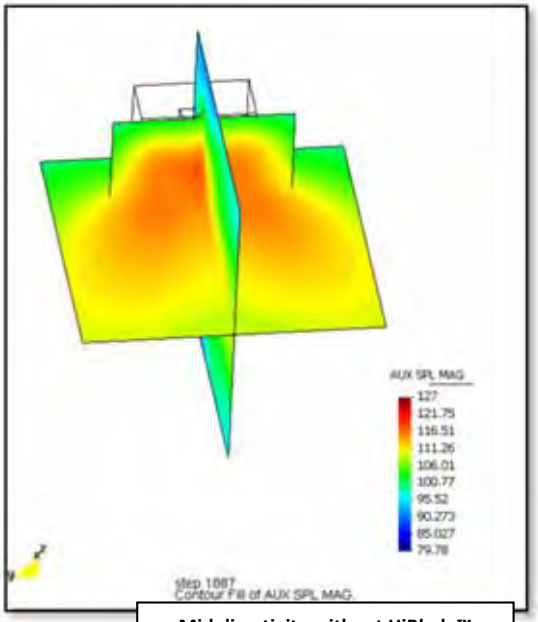




Another feature of MLA's midrange horn is the HiBlade™ device, which modifies the wave-propagation in the horn throat.

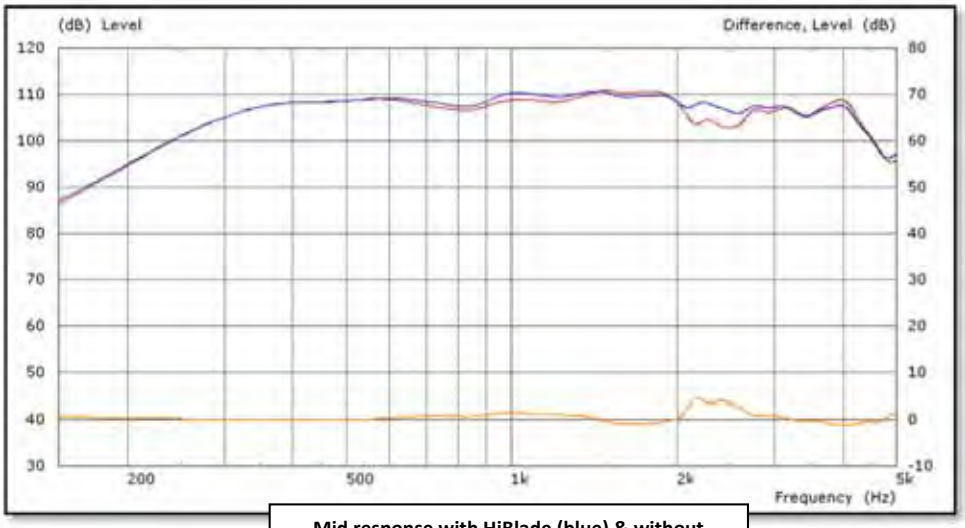


Mid directivity with HiBlade™



Mid directivity without HiBlade™

This further inc e frequency response ar to the 4kHz crossover point. This is high for a midrange horn and is key to enabling the use of 1"compression drivers for reproduction of high frequencies. MLA's 6.5"cone/1"compression driver combination replaces the more traditionally used large format compression driver and has less distortion, as well as having a much more extended HF response.



Mid response with HiBlade (blue) & without

* US Patent 6950530

High Frequency

MLA's HF section utilises 3 x 1"(25mm) exit neodymium compression drivers which feed separate, diffraction slot horns for true 90° horizontal constant directivity. In the vertical plane, MLA makes significant advances over previous thinking by adopting new vertical wavefront criteria.

Early proponents of touring line arrays strongly advocated a flat wavefront from each individual HF element. However, our sophisticated in-house BEM (Boundary Element Method) modelling techniques have shown that slightly curved wavefronts deliver much more consistent SPL's to the audience in real-world use where the array is curved.

BEM models of a conventional horn show that the waveform expands as its travels down the horn to produce a convex vertical wavefront which would generally be too curved for an ideal array element. Placing a kite shaped "wedge"part-way down the horn* introduces a concavity in the waveform which compensates for this.