

## ASPECT® SERIES ENGINEERING INFORMATION

**The Aspect® series is a range of high performance modular loudspeaker enclosures designed for use across a wide spectrum of sound reinforcement activities, easily scaleable to specific acoustical and venue requirements ranging from large scale indoor or outdoor concerts to corporate events, theatre shows and nightclub applications.**

The aim of any sound reinforcement system is to distribute sound evenly, with consistent frequency response and in a predictable way, across all seats of an auditorium or listening area. An optimum method of attaining this goal is through the correct application of point source arrays to create a segment of a spherical wavefront. Not only does this approach provide an exceptionally well defined and coherent acoustic source, but it also allows for considerable flexibility when assembling arrays in both horizontal and vertical dimensions.

In practice, the dispersion characteristics of a typical sound system are less than ideal because of the tendency for conventional high frequency exponential horns to 'beam' with increasing frequency. When arraying such horns, interference between adjacent sources is inevitable due to the variable curvature of the wavefront caused by the horn's geometry, and this results in undesirable comb filtering effects.

Turbosound engineers, through intensive research and the subsequent implementation of innovative and patented Polyhorn™ designs, have identified and overcome these deficiencies and implemented solutions in the Turbosound Aspect® series. Fundamental to the Polyhorn™ designs—and applied in both mid and high frequency bands—is the principle of dividing an exponential horn flare into a multiplicity of tapered waveguides. A further requirement is that all path lengths from the diaphragm surface to horn mouth are identical, and consequently

guarantees uniformity of phase of the wavefront at the horn mouth. The Polyhorn™ design effectively locates the acoustic centre well behind the motor system, forming a virtual point source whose radius coincides with the array curvature without requiring an excessively deep enclosure.

The **TA-500** is a trapezoidal three-way enclosure designed for ground-stacked touring and fixed installation applications. It houses high frequency, mid frequency and low frequency elements arranged in a vertical orientation, covering the frequency range from 60Hz to 20kHz.

The top section of the enclosure is dedicated to handling the high frequency band above 5kHz, being reproduced by a custom designed HF driver loaded by a high frequency Polyhorn™ device. The HF driver combines highly innovative patented (and patent applied for) design features to ensure exceptional high frequency performance and long term reliability. High-mid frequencies from 250Hz to 4kHz are handled by a custom designed 10" drive unit on a further Polyhorn™ device optimised for mid frequencies. A single 15" low-mid frequency driver loaded with a TurboBass™ device covers the remaining frequency range below 250Hz.

The TA-500 includes a passive crossover network between the MF and HF drive units for bi-amped operation. It can be bypassed for full tri-amped operation by moving an internal jumper located inside the connector panel, the status of which is visible externally.

A key feature of the Polyhorn™ designs is the very sharp cut-off at the edges of the coverage pattern, which all but eliminates the comb filtering effects commonly experienced between adjacent sources when arraying conventional horn designs. This makes it possible to achieve



### FEATURES

- Ultra low distortion**
- Very high output**
- Wide dispersion**
- Trapezoidal enclosure**
- Seamless arrayability**

### APPLICATIONS

- House of Worship**
- Ground-stacked touring**
- Fixed Installs**
- Live music venues**
- Dance clubs**

seamless arrayability in a very intuitive and predictable fashion.

All drive units employ high stability, radial neodymium magnet structures in order to provide very high motor strength—and hence fast transient response—as well as exceptional thermal performance. This also results in a useful reduction in weight which aids transportation and handling.

The TA-500 cabinet is constructed from 15mm (5/8”) and 18mm (3/4”) birch plywood, and is trapezoidally shaped with side angles optimised at 22.5° to ensure that adjacent boxes are currently positioned relative to each other with the optimum horizontal array angle.

The cabinet is equipped with two recessed handles on the sides, with additional grab positions at the rear of the box. A removable, stackable wheel-board clips on to the front of the cabinet for transportation. M10 rigging points are provided on the top, bottom and sides of the cabinet as well as two further points on the rear.

A cost-effective external flying system consists of internal steel struts which are used in conjunction with lifting bars, hinge kits and rear straps to assemble simple two-wide and three-wide arrays of cabinets.

A recessed panel at the rear of the cabinet carries two parallel-linked Speakon NL8MP's for input and loop-through connections, with a further Speakon NL4MP which is used for the sub link out connection.

## KEY FEATURES

- Controlled dispersion pattern of 45° x 25° generates highly focused coverage pattern in both horizontal and vertical planes with exceptional projection capabilities
- HF transducer and 10” high-mid driver employ a high stability, high temperature radial neodymium magnet structure which offers much higher efficiency, as well as reduced weight
- Patented HF Polyhorn™ designs generates equal level across a uniformly curved wavefront identical to the array profile
- Directivity over 1kHz exhibits very sharp cut-off at the edges of the pattern, dramatically reducing out-of-band signal
- Unique 10" high-mid frequency driver is fabricated from a single-piece spun aluminium bowl, serving as a high strength frame, heatsink, rear compression chamber and high pass filter
- Revolutionary composite cone materials are used in all cone transducers, giving high strength to weight ratio

## KEY SYSTEM BENEFITS

- Minimal destructive interference between adjacent enclosures, effectively giving seamless arrayability in both horizontal and vertical planes. All audience seats get essentially the same frequency response
- Wide horizontal dispersion pattern suits many one-box-a-side touring applications
- Intuitive 'point and shoot' characteristics make it very easy to adapt flown or ground stacked clusters to widely variable venue and audience requirements
- Very high power capability combined with high efficiency means that peak sound pressure levels of up to 141dB are easily achievable from one cabinet
- Greatly improved thermal performance from neodymium magnet structures reduces power compression to negligible levels and delivers more amplifier power into acoustic watts
- Ability to tailor the PA coverage according to extremely varied venue requirements; can achieve optimum coverage even in irregularly shaped rooms
- Integrates with Aspect® TA-880H trapezoidal cabinets



<b>DIMENSIONS (HxWxD)</b>	977mm x 574mm x 498mm (38.5" x 22.6" x 19.6")																
<b>NET WEIGHT</b>	52kg (114.4 lbs)																
<b>COMPONENTS</b>	1 x custom 15" (381mm) LF driver, 1 x custom 10" (254mm) MF driver on a midrange Polyhorn™, 1 x custom HF driver on a high frequency Polyhorn™																
<b>FREQUENCY RESPONSE<sup>1</sup></b>	60Hz - 20kHz ±4dB (with DSP)																
<b>DISPERSION<sup>2</sup></b>	50°H x 25°V; horizontal array angle: 45°																
<b>POWER HANDLING</b>	LF: 400 watts r.m.s., 800 watts program MF: 200 watts r.m.s., 400 watts program HF: 50 watts r.m.s., 100 watts program																
<b>SENSITIVITY<sup>3</sup>(1W@1M)</b>	LF: 106dB; MF: 105dB; HF: 112dB																
<b>MAXIMUM SPL</b>	135dB continuous <sup>4</sup> , 141dB peak <sup>5</sup>																
<b>CROSSOVER POINTS</b>	Passive: 250Hz, Active: 250Hz, 4k/5k99Hz																
<b>NOMINAL IMPEDANCE</b>	LF: 8 ohms; MF: 16 ohms; HF: 16 ohms																
<b>CONSTRUCTION</b>	15mm (5/8") and 18mm (3/4") birch plywood throughout; rebated, screwed and glued. Finished in black semi-matt textured paint (optional TurboBlue™). Two recessed carrying handles and two additional grab positions.																
<b>GRILLE</b>	Powder coated perforated steel with reticulated foam backing																
<b>CONNECTORS</b>	(2)  ) Neutrik Speakon NL8 wired: pin1+ and 1- link to NL4; pin 2+: LF positive; pin2-: LF negative; pin 3+: MF positive, pin 3-: MF negative, pin 4+: HF positive, pin 4- HF negative (1) Neutrik Speakon NL4 wired: pin1+: sub positive, pin1-: sub negative																
<b>SPARES AND ACCESSORIES</b>	<table border="0"> <tr> <td>MG-500</td> <td>Replacement cloth/expanded metal grille</td> </tr> <tr> <td>LS-1527</td> <td>15" (381mm) LF loudspeaker</td> </tr> <tr> <td>RC-1527</td> <td>Recone kit</td> </tr> <tr> <td>LS-1021.2</td> <td>10" (254mm) HMF loudspeaker</td> </tr> <tr> <td>RC-1021.2</td> <td>Recone kit</td> </tr> <tr> <td>CD-113</td> <td>HF driver</td> </tr> <tr> <td>RD-113</td> <td>Replacement HF diaphragm</td> </tr> <tr> <td>WB-500</td> <td>Wheelboard</td> </tr> </table>	MG-500	Replacement cloth/expanded metal grille	LS-1527	15" (381mm) LF loudspeaker	RC-1527	Recone kit	LS-1021.2	10" (254mm) HMF loudspeaker	RC-1021.2	Recone kit	CD-113	HF driver	RD-113	Replacement HF diaphragm	WB-500	Wheelboard
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**Notes**

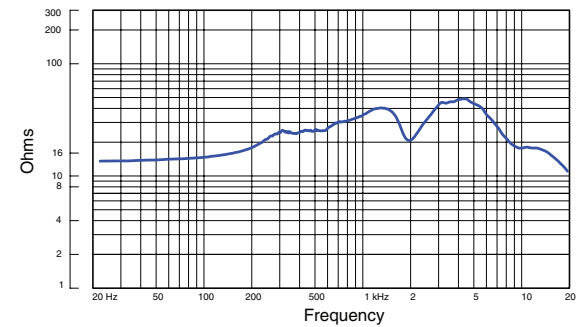
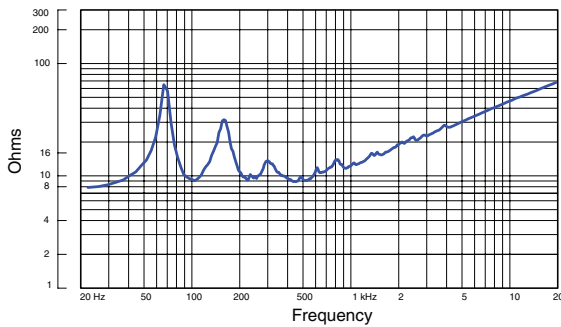
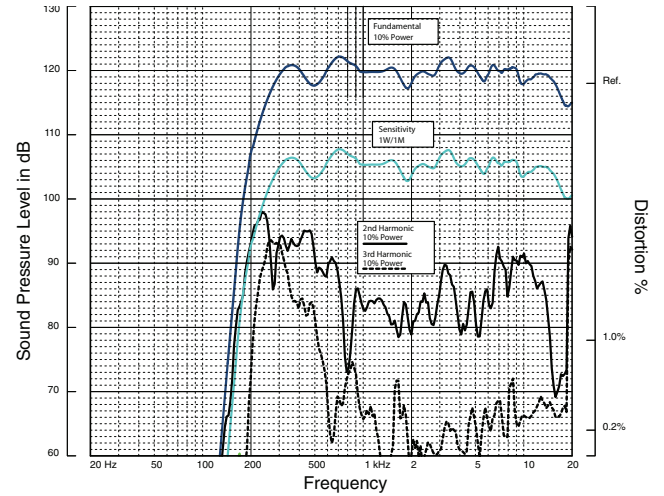
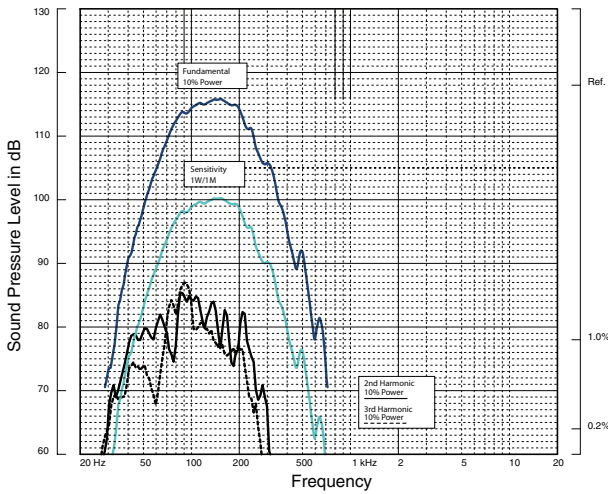
<sup>1</sup>Measured on axis

<sup>2</sup>Average over stated bandwidth

<sup>3</sup>Average over stated bandwidth

<sup>4</sup>Unweighted diode-clipped pink noise. Measured in a half space environment.

<sup>5</sup>Verified by subjective listening tests of familiar program material, before the onset of perceived signal degradation.



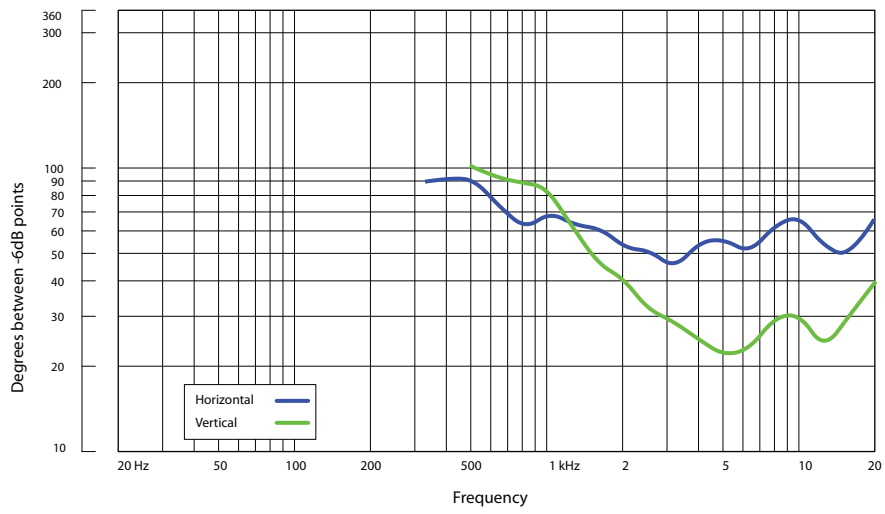
**LOW FREQUENCY**

**HIGH/MID FREQUENCY**

**Impedance** A constant current circuit was used to measure the impedance. **Frequency response** The frequency response shown was obtained by feeding a swept sine wave through the system in a half space environment. The position of the microphone was vertically on-axis at a distance of 2 metres, then scaled to represent 1 metre. **2nd & 3rd Harmonic Distortion** Distortion measurements were obtained using an Audio Precision harmonic distortion analysis system and comply with AES recommendations for enclosure measurement (AES paper ANSI S4-26-1984). **Data Conversion** All graphs were digitally generated using the APEX custom software system, designed to translate data derived from Audio Precision 'System One' test equipment into AutoCAD™. This program enables graphical information to be plotted to a high degree of accuracy.

**NOTES ON MEASUREMENT CONDITIONS**

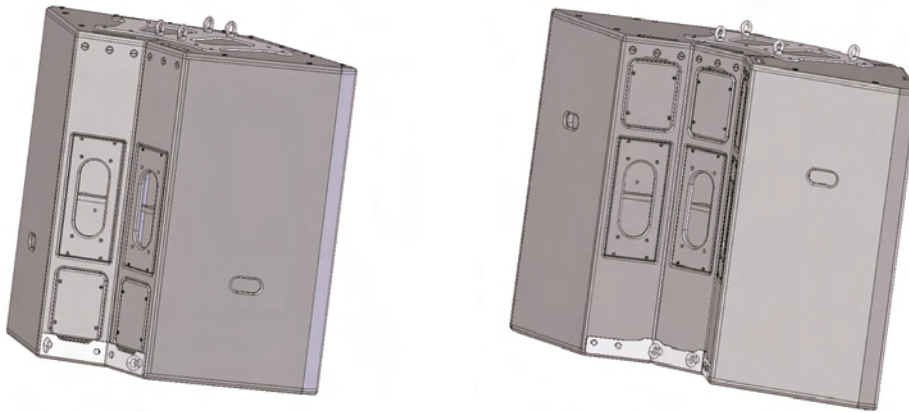
**BEAMWIDTH**



The rigging system is designed to provide two-wide and three-wide array configurations up to a maximum of three cabinets deep using a minimum of easy to assemble parts.

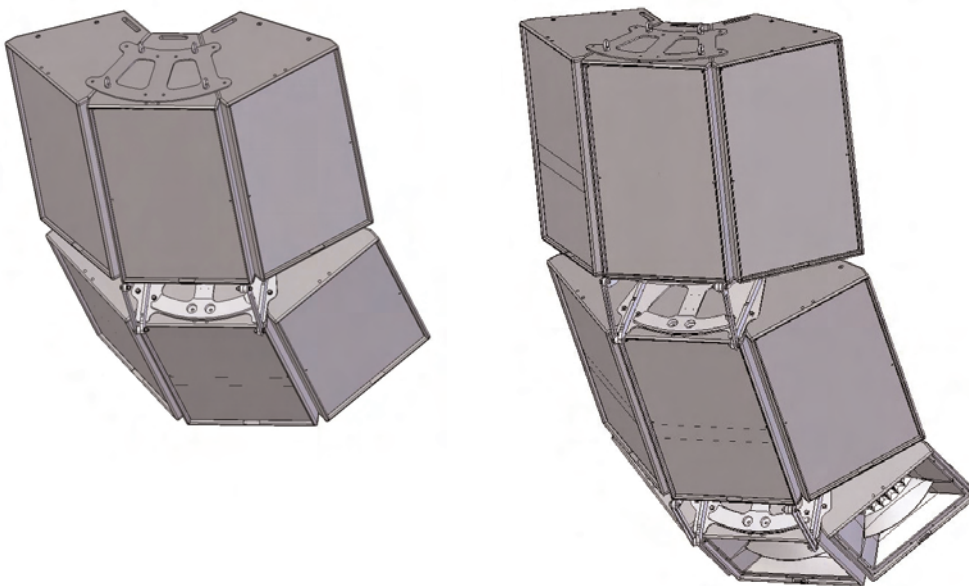
**RIGGING HARDWARE**

The single row system consists of two-wide and three-wide top rigging plates together with back straps to hold cabinets securely as a single block with a horizontal array angle of 45°.



Lifting an array is achieved using M10 collared eyebolts attached to the top, and the array can be tilted using rigging points on the rear. Cabinets are symmetrical as far as the rigging points are concerned, and this feature allows cabinets to be suspended upside down if required as shown above.

Flying arrays with additional rows, up to a maximum of three deep, requires the use of hinge kits between rows in either two-wide or three-wide configurations. The vertical array angle between rows is infinitely variable between 0° and 25°.



**ARCHITECTURAL  
& ENGINEER'S  
SPECIFICATIONS**

The loudspeaker system shall be of the trapezoidal switchable bi-amped/tri-amped type comprising: one high frequency driver loaded with a patented PolyHorn™, one 10" (254mm) high-mid frequency driver loaded with a patented PolyHorn™, and one 15" (381mm) low frequency driver loaded with a TurboBass™ device. Performance specifications of a typical production unit shall meet or exceed the following:- Frequency response, measured with a swept sine wave input shall be flat within  $\pm 4\text{dB}$  from 60Hz to 20kHz (with DSP). Dispersion shall average  $50^\circ\text{H} \times 25^\circ\text{V}$ . Nominal impedance shall be LF: 8 ohms, MF: 16 ohms, HF: 16 ohms. Power handling shall be LF: 400 watts r.m.s., 800 watts program; MF: 200 watts r.m.s., 400 watts program; HF: 50 watts r.m.s., 100 watts program. Sensitivity measured with 1 watt input at 1 metre distance on axis, mean averaged over stated bandwidth shall be LF: 106dB, MF: 105dB, HF: 112dB. Maximum SPL (peak), measured with music program shall be 141dB. Dimensions: 977mm x 574mm x 498mm (38.5" x 22.6" x 19.6"). Weight: 52kg (114.4lbs). The loudspeaker system shall be the Turbosound Aspect TA-500. No other system shall be acceptable unless the above combined performance specifications are equalled or exceeded. Flying and installation hardware shall be available comprising a range of load-certified components.

**DIMENSIONS**

