datasheet

# TA-500tDP

## 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 scalable 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-500tDP** is a trapezoidal networkable digitally self-powered three-way enclosure with integral flyware designed for concert touring applications. It houses high frequency, mid frequency and low frequency elements arranged in a vertical orientation, covering the frequency range from 60Hz to 20kHz. It includes an integrated 2-channel Class D power amplifier and system control module with built-in networking capability.

The TA-500tDP features a new generation of innovative lightweight Class D amplifiers, utilising revolutionary 96kHz DSP technology to give operating efficiency in excess of 90%.

The rear panel module incorporates high performance limiters set to optimise the continuous power and excursion threshold for the specific loudspeaker model. Two independent amplifier channels power the LF and MF/HF drivers separately in order to maximise headroom. A Neutrik™ Powercon connector provides mains input to the unit—the switch mode power supply is auto-sensing over a range from 100 volts to 240 volts—and 3-pin XLR's are used for input and parallel link signal connections. RJ45 network connectors enable multiple loudspeakers to be controlled and monitored over a BVNet network using TurboDrive™ software.

BVNet allows the creation of a network of powered loudspeakers which can be controlled and monitored with a PC running the TurboDrive™ control software. This allows considerable flexibility in adapting the speaker system to the acoustic environment with full user control of equalisation and delay, while at

### FEATURES

- Digitally self-powered
- Ultra low distortion
- Very high output
- Wide dispersion
- Trapezoidal enclosure
- Integrated flyware
- Seamless arrayability

### APPLICATIONS

- Concert touring
- Live music venues
- House of Worship
- Dance clubs

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the same time ensuring a high degree of security control by monitoring critical functions such as current, driver impedance and limiting.

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.

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 seamless arrayability in a very intuitive and predictable fashion.

All drive units employ high stability, 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-500tDP 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 correctly positioned relative to each other with the optimum horizontal array angle.

A fully integrated rigging system is built into the enclosure and consists of steel strips rebated into the cabinet sides. The system allows loudspeaker clusters up to three cabinets wide by three deep to be flown. Inter-cabinet links connect additional rows of cabinets, allowing a range of vertical coverage angles. Cabinets are held in vertical alignment by means of the captive biscuits built into each cabinet.

The cabinet is equipped with a recessed handle on the bottom of the cabinet, with an additional grab position at the top. A removable, stackable wheelboard clips on to the front of the cabinet for transportation. The TA-500t can also be stacked on wheels for ease of trucking and saving of warehouse floor space.

## KEY FEATURES

• Controlled dispersion pattern of 50° x 25° generates highly focused coverage pattern in both horizontal and vertical planes with exceptional projection capabilities

• HF transducer employs a high stability, high temperature neodymium magnet structure which offers higher efficiency, as well as reduced weight

• Patented HF and MF Polyhorn™ designs generate equal level across a uniformly curved wavefront whose radius is 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 aluminium bowl, serving as a high strength frame, heatsink, rear compression chamber and high pass filter.

## 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

## ASPECT SERIES ENGINEERING INFORMATION

| | |
|---|---|
| **DIMENSIONS (HxWxD)** | 977mm x 574mm x 498mm (38.5” x 22.6" x 19.6") |
| **NET WEIGHT** | 59kg (129.8 lbs) |
| **COMPONENTS** | 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™ |
| **FREQUENCY RESPONSE[1]** | 60Hz - 20kHz ±4dB (with DSP) |
| **DISPERSION[2]** | 50°H x 25°V; horizontal array angle: 45° |
| **MAXIMUM SPL** | 135dB continuous[3], 141dB peak[4] |
| **CONSTRUCTION** | 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 grab handles. Integral flying hardware. Detachable wheelboard. |
| **GRILLE** | Powder coated perforated steel backed with reticulated foam |
| **CONNECTORS** | Input: (1) XLR female, Link: (1) XLR male, pin 2 hot; Neutrik Powercon; (2) RJ45 network port |

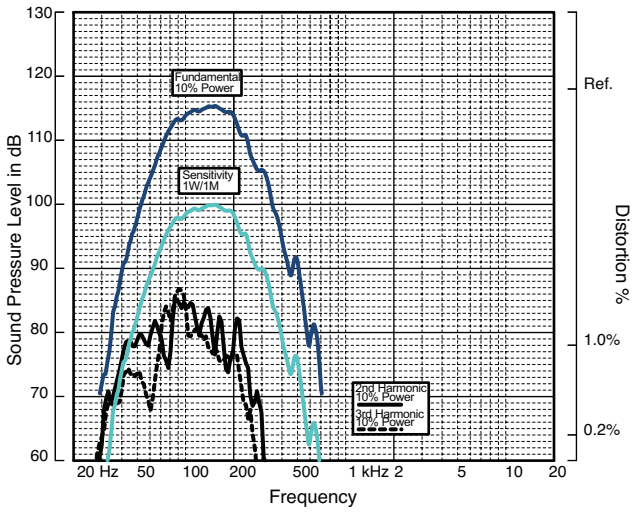
**AMPLIFIER**

| | |
|---|---|
| **TYPE:** | Class D inc SMPA and networked DSP |
| **POWER OUTPUT:** | 2 x 800 watts continuous @ 8 ohms (1kHz, 0.01% THD) |
| **DYNAMIC RANGE:** | 110dB |
| **INPUT CLIP:** | 10dBu |
| **BANDWIDTH:** | 20Hz - 20kHz ±0.5dB |
| **POWER REQUIREMENTS:** | 100V to 240V AC @ 50/60Hz |

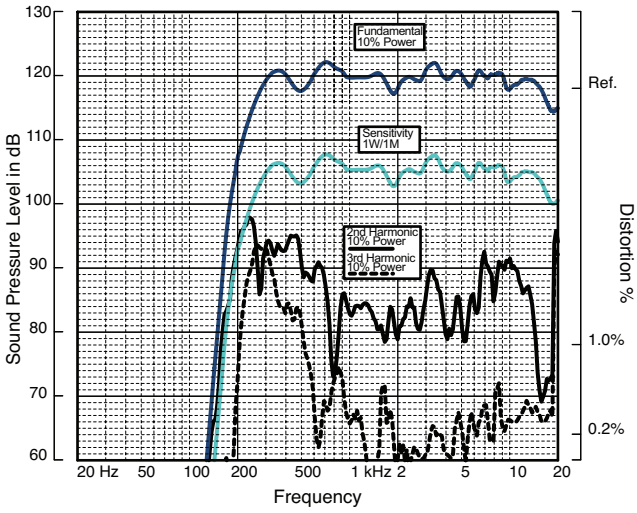
**SPARES AND ACCESSORIES**

| | |
|---|---|
| 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 |

**Notes**
[1]Measured on axis
[2]Average over stated bandwidth
[3]Unweighted diode-clipped pink noise. Measured in a half space environment.
[4]Verified by subjective listening tests of familiar program material, before the onset of perceived signal degradation.




LOW FREQUENCY

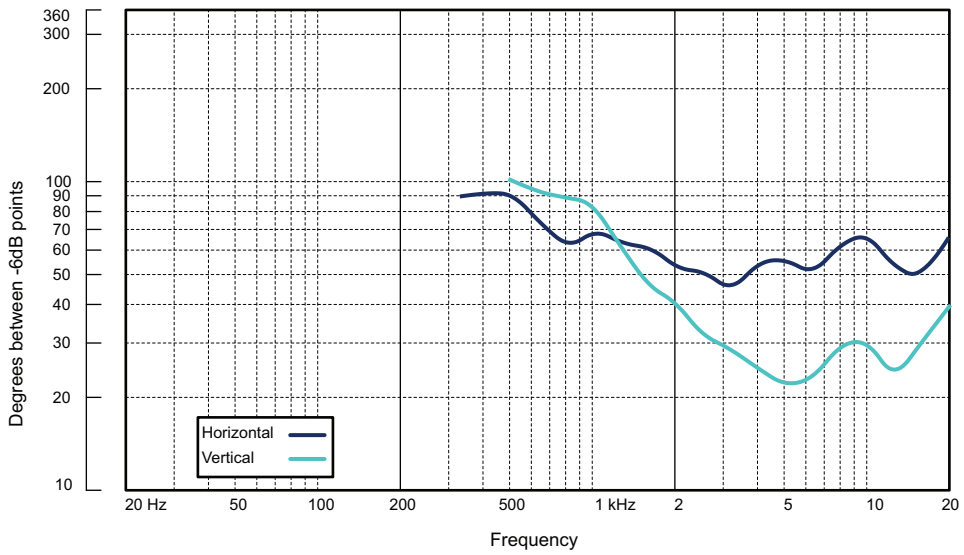



HIGH/MID FREQUENCY

## NOTES ON MEASUREMENT CONDITIONS

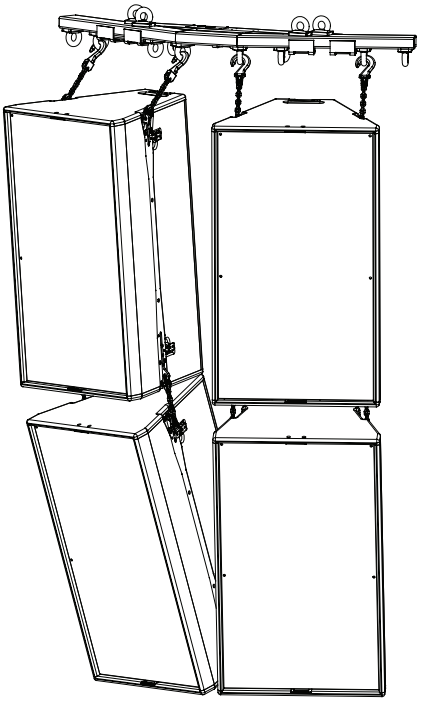
**Impedance** A constant current circuit was used to measure the impedance. **Frequency response** The frequency response shown was obtained by feeding a swept sine wave through the system in a half space environment. The position of the microphone was vertically on-axis at a distance of 2 metres, then 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.

## BEAMWIDTH

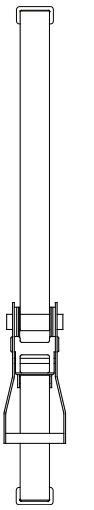

360
300
200
100
90
80
70
60
50
40
30
20
10
Degrees between -6dB points
Horizontal
Vertical
20 Hz
50
100
200
500
1 kHz
2
5
10
20
Frequency

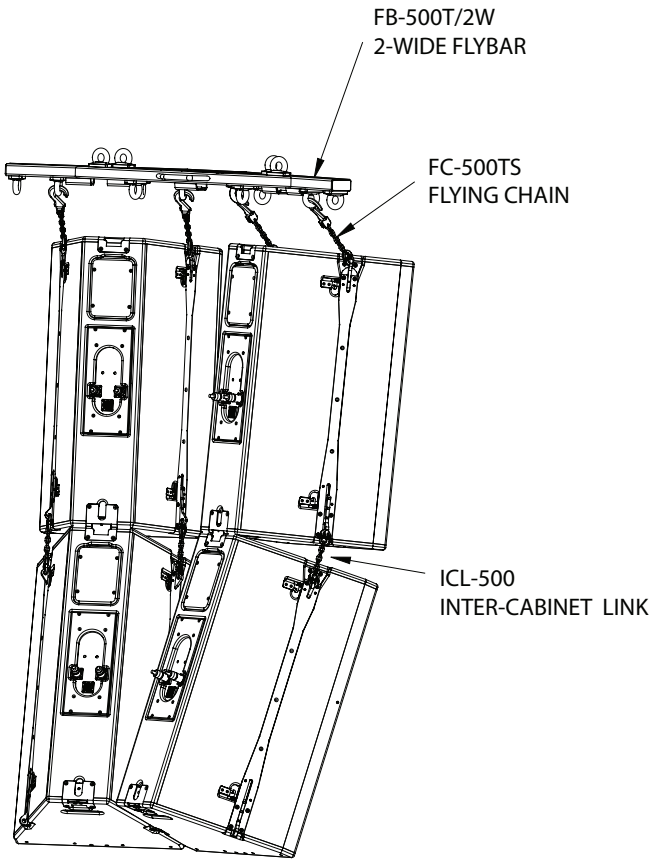
## RIGGING HARDWARE

The rigging system is fully integrated into the cabinet in order to enable flown clusters to be assembled quickly and easily with the minimum of external parts. It consists of load-bearing steel strips rebated flush into the sides of the cabinet, and these are used in conjunction with fixed angle flybars designed to provide single column, two-wide and three-wide array configurations up to a maximum of nine cabinets. Additional cabinets are connected using inter-cabinet links, secured by retractable pins in the flygear, and these are designed to offer a range of vertical angles. A captive biscuit located at the rear of the cabinet provides the hinge mechanism necessary to tie the backs of the cabinets together.



The external hardware consists of two-wide and three-wide fixed angle flybars, standard length and long flying chain assemblies, inter-cabinet links, chain bridles and ratchet straps. The flybars provide both wide and narrow lifting points and pick up points to accommodate shallow or deep arrays, and offer a wide range of coverage requirements.



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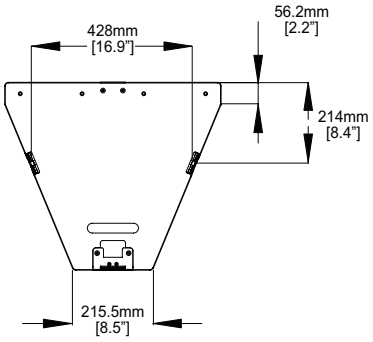
# TA-500tDP

## ASPECT® SERIES ENGINEERING INFORMATION

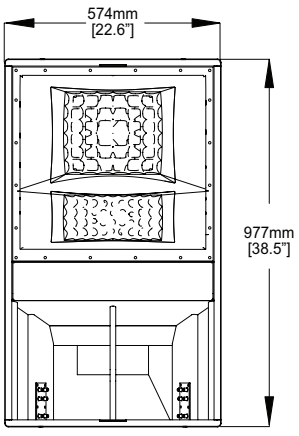
### ARCHITECTURAL & ENGINEER'S SPECIFICATIONS

The loudspeaker system shall be of the trapezoidal networkable digitally self-powered type with integral rigging hardware 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. The integral power amplifier module shall provide Class D amplification, output limiting, and equalisation incorporating frequency responses optimised for speech and music. 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 ±4dB from 60Hz to 20kHz (with DSP). Dispersion shall average 50°H x 25°V. 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: 59kg (129.8lbs). The loudspeaker system shall be the Turbosound Aspect TA-500tDP. No other system shall be acceptable unless the above combined performance specifications are equalled or exceeded.

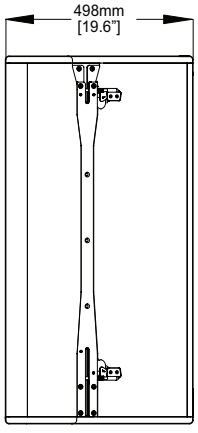
### DIMENSIONS



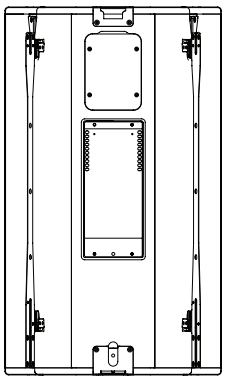

TOP




FRONT




SIDE



REAR

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