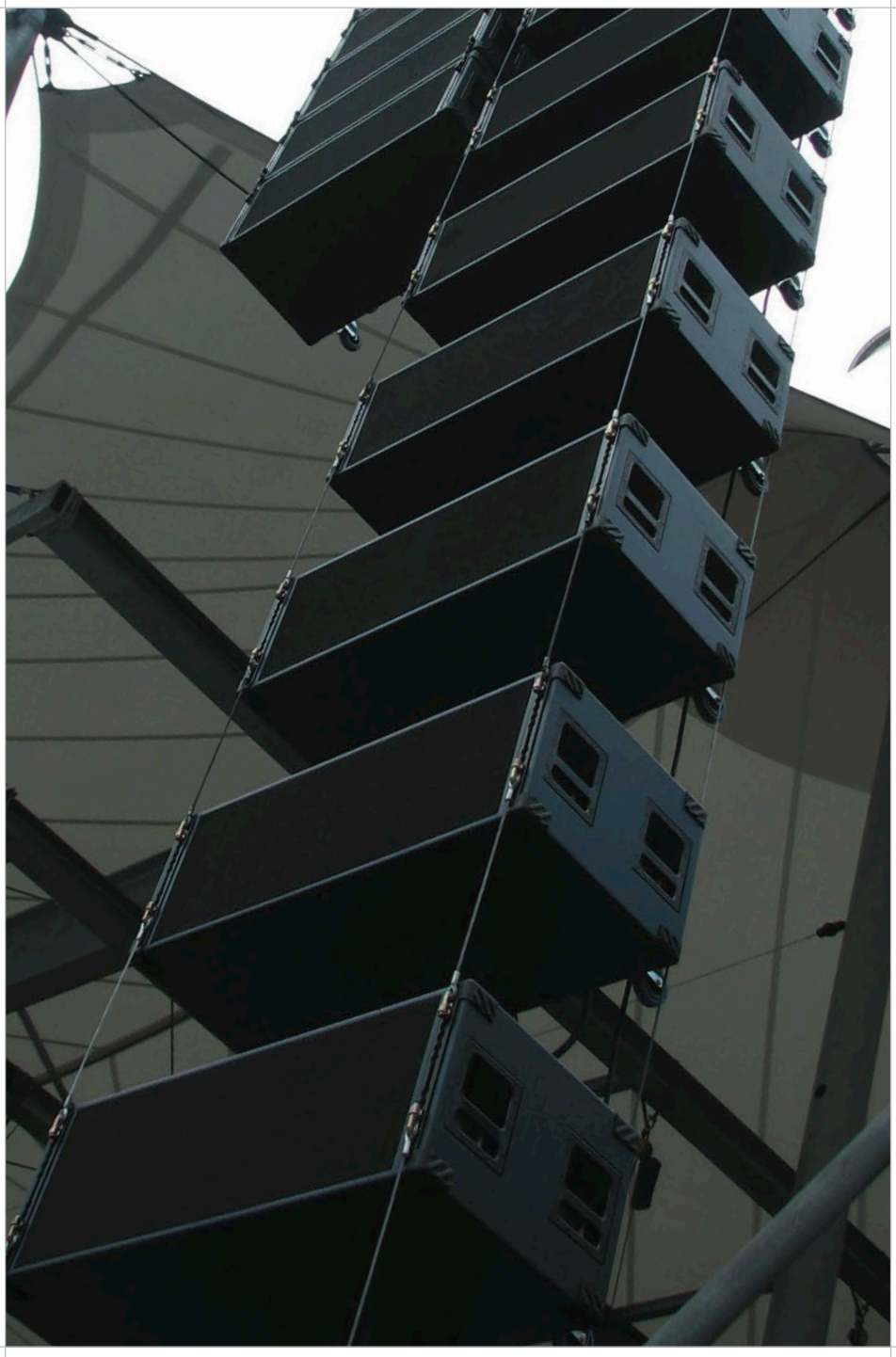
AXYS®Beam Shaping Subwoofers

BASS that YOU control

JBL PROFESSIONAL by HARMAN

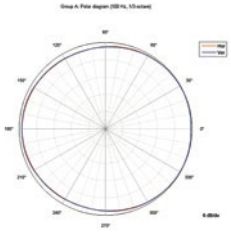


Shaping the future of sound reinforcement

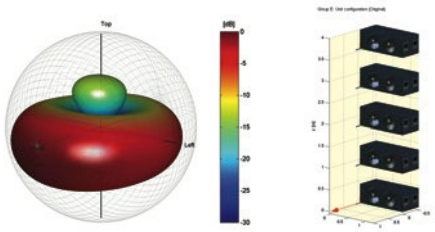
Scaleable and Versatile

The AXYS range of Beam Shaping Subwoofers are designed to be totally versatile, scalable and easy to use. Those who invest in the technology can achieve maximum control for the minimum of investment. One day you could use a huge array of subs to control the low end at a large arena or stadium gig and the next day you could use one unit on its own in a simple conference setup or 3 units combined in a hyper cardioid set up in a theatre or concert hall. Or simply use a single unit as a conventional subwoofer.

What is a Beam Shaping Subwoofer?

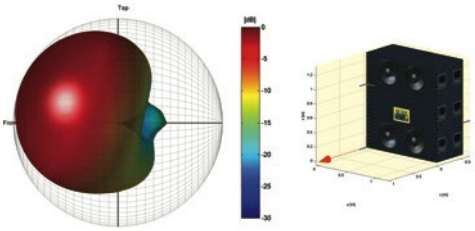


When starting out in the audio industry engineers often think of subwoofers and low frequencies as being Omni-directional, radiating equally in all directions. Of course no subwoofer is truly Omni-directional, they're behaviour does vary with frequency and they become more directional at higher frequencies.



Example 3D Directivity balloon for a B-215 Double Spaced Bass Array

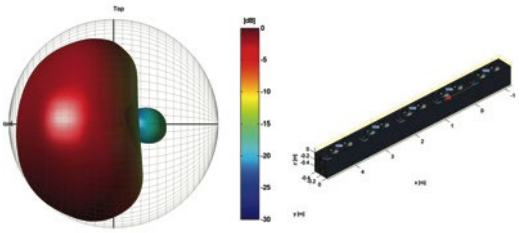
As with any loudspeaker if you start arraying subwoofers the basic physics tells us that they will start to interact with each other and that they will start beaming, so you can add horizontal directivity, vertical directivity or even both. Likewise if you have rear facing drivers and process them correctly you can create directivity patterns that display cardioid or hyper cardioid behaviour patterns.



Example 3D Directivity balloon for a B-215 Cardioid Bass Array

All AXYS Beam Shaping Subwoofers are self powered and come complete with built in DSP to help maximise these physical effects and put you in control of your bass array. This built in DSP provides the ability to process each driver in a bass array individually and have the maximum possible control over the behaviour of a bass array.

The directivity patterns opposite can be created using all AXYS Beam Shaping Subwoofers:



Example 3D Directivity balloon for a B-215 End-Fire Bass Array

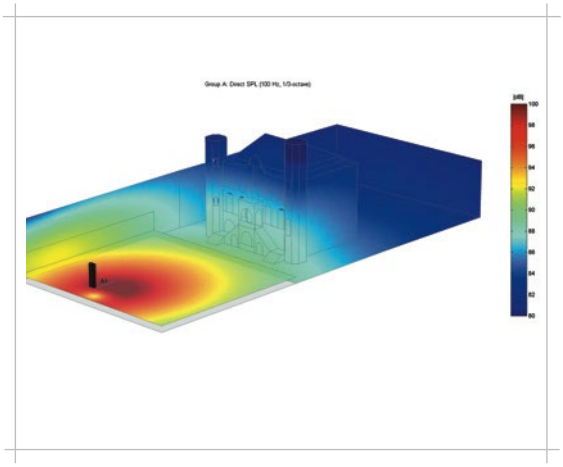
Why would I need a Beam Shaping Subwoofer?

Bass with precision and punch

Being able to control the dispersion of the bass array in a difficult acoustic space, such as a large indoor arena or concert hall you can add more definition & punch to the low end and banish that flabby undefined bass sound that you normally experience due to the poor the direct to reverberant ratio at low frequencies. Basically you can aim the bass where you want it, at the audience, and excite them and not the room.

Reduce noise pollution!

Controlling the dispersion of a bass array can also help deal with the tricky problem of noise pollution at large outdoor events. By shaping and steering the dispersion of the array you can really maximise the experience for the audience whilst keeping the neighbours happy too! At last bass with fewer complaints.



Keep the stage and FOH mix clean!

You can also use Beam Shaping Subwoofers to reduce the level of bass coming from the PA onto the stage, therefore allowing you to maintain safe monitor levels onstage; which not only helps for noise at work regulations but also means you have a cleaner mix out front.

Minimum investment – Maximum control

AXYS Beam Shaping Subwoofers are designed to be highly versatile so that the same loudspeakers can be used in any array format or on their own in a more conventionally crossed over mode.

There's no need for special rear firing units, for example, which means you can make your inventory work harder for you.

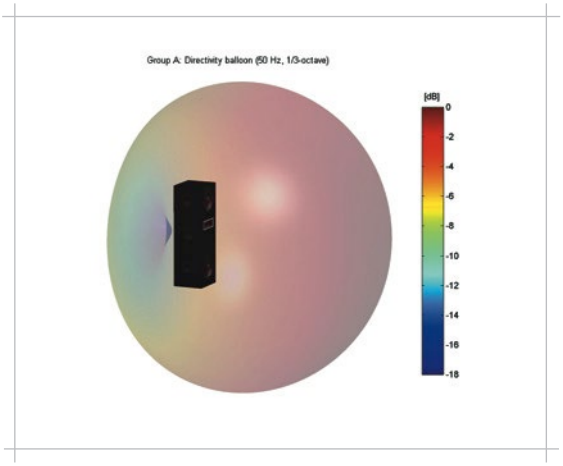
You can also choose whether you want to use an AXYS Beam Shaping Subwoofer in an array in Beam Shaping mode or as a single unit with a standard crossover.

What makes the AXYS Beam Shaping Subwoofers so special?

It's the attention to the detail that makes these products and the results that you can achieve with them so special.

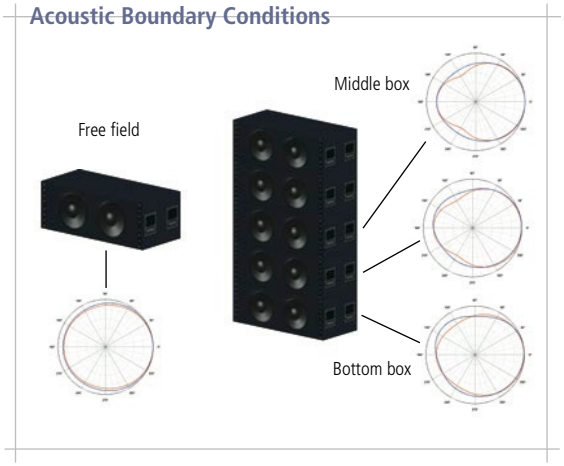
- Broadband control, because we can manipulate the frequency and phase response of each driver in the array we have the ultimate control.
- Near field and far field control of your array thanks to our DDS Algorithms
- Versatile inventory, units can be used as single boxes or in arrays.

We do the science, leaving you to create great sound



AXYS Beam Shaping Subwoofers are designed to be easy to use and configure. For this reason you can download a variety of "ready made" configurations from our website and for those requiring custom arrays you can build and model yourself in our DDA software.

It's all about wavelengths, interaction and attention to detail. It's the attention to detail that really makes AXYS Beam Shaping Subwoofers unique. It's important to note that the DSP allows us to have full control over the frequency and phase response of an array meaning that the array control is very accurate and is implemented across the full bandwidth of the systems, unlike other systems that are tuned to work at specific frequencies.



Gaining directivity in large vertical or horizontal arrays

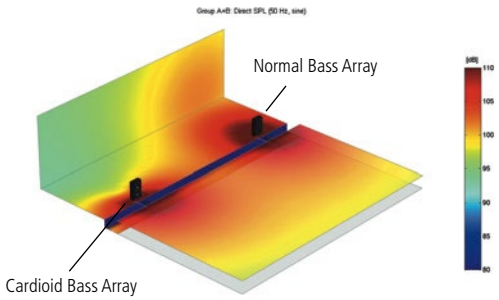
To gain control of the directivity of a bass array, either vertically or horizontally then you can't escape the basic physics. You need a long array to be able to control long wavelengths. Even with a 4 metre long bass array you can make a huge improvement to the vertical directivity

So once you have a long array then its simple, right? Well yes you can start to do some beam shaping but it's not going to be very accurate unless you pay attention to the detail, for example the boundary conditions start to come into the equation. As you increase the size of an array then its dispersion starts to vary. This is because you are building a larger baffle.

So by taking this into account then we can maximise the performance of the array.

Making Cardioid/Hyper Cardioid arrays

In practice the optimum behaviour isn't always perfectly cardioid. Often DDA creates a "cardioid-like" directivity pattern (something between cardioid and hyper cardioid) which gives a better global rejection at the rear of the array.



When it comes to creating cardioid/hyper cardioid arrays then its all about interference. The energy at the rear of the array is cancelled out by rear facing drivers. This sounds simple, however, what you then need to consider is the fine detail. When you start subtracting decibels then accuracy is essential if you want to get the maximum reduction. For this reason the acoustic boundary conditions of an array can be taken into account to ensure that the best possible result is achieved. These conditions are not only the effect of the baffle size (array size) but also things like the stage or floor that the units are placed upon.

Generic Specifications

Input	- Nominal level	0 dBV (RMS)
	- Maximum level	+ 18 dBV (peak)
	- Type	twin transformer balanced
	- Impedance (balanced)	32 kΩ
DSP hardware	- Type	floating point 900 MFLOPS 32 bits
	- Memory	64 Mb SDRAM + 3 Mb non volatile
	- AD - DA conversion	24 bits sigma-delta 128 x oversampling
	- Auxiliary processor	200 nsec single cycle RISC
	- Sample rate	48.8 kHz (full range enclosures); 12.2 kHz (subwoofers)
DSP software	- Delay	- up to 21 s of overall delay - up to 21 s of individual output delay
	- Volume control and mute	- volume range -72 to +18 dB - adjustable mute auto-release
	- EQ	8-band parametric EQ
	- X-overs	See individual specs
	- Dynamics	Independent peak compressor/limiters on all outputs - Frequency dependent thresholds (excursion limiting)* - Auto-attack 'look-ahead' scheme - Independent RMS limiters on all outputs Time dependent thresholds (power limiting)
	- Presets	8 configurable internal presets
Power amplifiers	- Protection	- DC - short circuit
Network control unit	- Interface type	- serial full-duplex RS-485 - optically isolated - parallel connection - 'star' configuration allowed, depending on cable properties - closed loop not allowed
Status / failure monitoring - Surveillance		- input pilot tone detection (20k - 30k Hz, level > -22 dBV) - transducer loadmonitoring - amplifier monitoring - general status (DSP running, temperatures etc.) - thermal overload protection scheme - real-time in- and output level monitoring - status of dynamics processing
	- Fan*	- single low speed large fan - temperature controlled - audio signal dependent control scheme - speed and failure monitoring
	- Failure	- indication on rear and front LED (maskable)
Indicators	- Front LED (red)	- failure indication (software configurable) - unit identification
	- Rear LED (bi-colour)	- power-on - failure indication (software configurable) - unit identification
Controls	- Reset switch	- preset selection - select preferential preset
Connectors	- Audio input and link	XLR 3p female (input), XLR 3p male (hardwired link)
	- RS-485 interface and link	XLR 5p female (input), XLR 5p male (hardwired link)
	- Mains input and link	Neutric Powercon 3p male (input), Neutric Powercon 3p female (hardwired link)
Mains	- Type - Voltage range	switched mode PSU 100 V to 250 V, 50 or 60 Hz
	- Protection	- thermal protection on standby supply - output power limiting - under-voltage and over-voltage lock out

*Specification for B-215 and B-121 may vary, please check individual specs sheets

Individual Specifications

AXYS®UB-25G2

Acoustical Freq range		40 Hz, -3dB, LF 120 Hz, -6dB, HF (typical)
Max SPL (1 m)	- Continuous (max) - Continuous (limiter onset) - Peak (max) - Peak (limiter onset)	120 dBSPL(RMS) 114 dBSPL(RMS) 128 dBSPL(peak) 122 dBSPL(peak)
Dynamic range		> 104 dB
X-overs	- Beam Shaping - Standard	Defined by DDS Algorithm - typical slope 24 dB/oct - typical target 4th order Linkwitz-Riley delay aligned - typical crossing frequency 120 Hz - HPF for 6th order LF alignment
Latency		- 5.6 ms
Power amplifiers	- Type - Power	MOSFET (class AB) 1 x 700 Wrms (4 Ω)
General: Transducer		1 x 15" front-loaded bass-reflex
Dimensions (H x W x D)		429 mm (16.9") x 620 mm (24.4") x 550 mm (21.7")
Weight		36 kg (79 lbs)

AXYS®B-07G2

Acoustical Freq range		40 Hz, -3dB, LF 120 Hz, -6dB, HF (typical)
Max SPL (1 m)	- Continuous (max) - Continuous (limiter onset) - Peak (max) - Peak (limiter onset)	122 dBSPL(RMS) 117 dBSPL(RMS) 130 dBSPL(peak) 125 dBSPL(peak)
Dynamic range		> 104 dB
X-overs	- Beam Shaping - Standard	Defined by DDS Algorithm - typical slope 24 dB/oct - typical target 4th order Linkwitz-Riley delay aligned - typical crossing frequency 120 Hz - HPF for 6th order LF alignment
Latency		- 5.6 ms
Power amplifiers	- Type - Power	MOSFET (class AB) 1 x 700 Wrms (4 Ω)
General: Transducer		1 x 18" front-loaded bass-reflex
Dimensions (H x W x D)		620 mm (24.4") x 620 mm (24.4") x 550 mm (21.7")
Weight		45 kg (99 lbs)

Individual Specifications

AXYS®B-121G2

Acoustical Freq range		35 Hz, -3dB, LF 120 Hz, -6dB, HF (typical, varies in beam shaping mode)
Max SPL (1 m)	- Continuous (max) - Continuous (limiter onset) - Peak (max) - Peak (limiter onset)	120 dBSPL(RMS) 118 dBSPL(RMS) 129 dBSPL(peak) 126 dBSPL(peak)
Dynamic range		> 104 dB
X-overs	- Beam Shaping - Standard	Defined by DDS Algorithm - typical slope 24 dB/oct - typical target 4th order Linkwitz-Riley delay aligned - typical crossing frequency 120 Hz - HPF for 6th order LF alignment
Latency		- 5.6 ms
Power amplifiers	- Type - Power	MOSFET (class AB) 1 x 800 Wrms (4 Ω)
General: Transducer		1 x 21" front-loaded bass-reflex
Dimensions (H x W x D)		620 mm (24.4") x 620 mm (24.4") x 675 mm (26.6")
Weight		64 kg (141 lbs)

AXYS®B-215

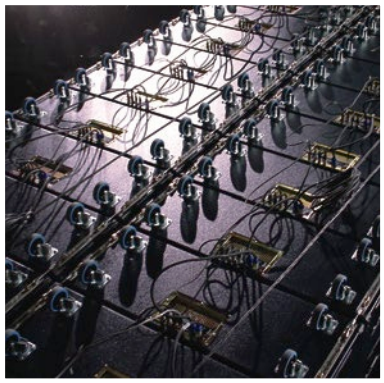
Acoustical Freq range		45 Hz, -3dB, LF 300 Hz, -3dB, HF (upper)
Max SPL (1 m)	- Continuous (max)	130 dBSPL(RMS)
Dynamic range		> 104 dB
X-overs	- Beam Shaping	- Defined by DDS Algorithm
Latency		- 5.6 ms
Power amplifiers	- Type - Power	MOSFET (class AB) 2 x 400 Wrms (4 Ω)
General: Transducer		2 x 15" front-loaded bass-reflex
Dimensions (H x W x D)		460 mm (18") x 1240 mm (49") x 554 mm (22")
Weight		86 kg (190 lbs)

What makes the AXYS Beam Shaping Subwoofers so special?

Having started the beam steering revolution back in the 1990's with their Intellivox range, audio industry pioneers JBL Professional are once again embarking on another adventure with their range of Beam Shaping Subwoofers which feature JBL Professional's Digital Directivity Synthesis technology.

It's the attention to the detail that makes these products and the results that you can achieve with them so special.

- Broadband control, because we can manipulate the frequency and phase response of each driver in the array we have the ultimate control.
- Near field and far field control of your array thanks to our DDS Algorithms
- Versatile inventory, units can be used as single boxes or in arrays.






JBL Professional
8500 Balboa Boulevard
Northridge, CA 91329 U.S.A.

www.jblpro.com

BSSWA40310-BR