The JBL Professional® Target Range

A fully scalable, front of house system which incorporates the JBL Professional® DDS technology.

Shaping the future of sound reinforcement

Simple Installation, Unrivalled Control.

Whether you need a permanent, semi-permanent or mobile front of house solution, the JBL Professional® Target system offers a level of control previously unavailable in any touring system.

This self powered, scaleable system with built-in DSP, takes full advantage of JBL Professional® Digital Directivity Synthesis (DDS). This forward thinking technology electronically moulds the array dispersion to the audience space; providing even SPL distribution, reduced noise nuisance and improved intelligibilty. This outstanding performance is achieved without compromising the system's sound quality and, like all JBL Professional® sound reinforcement products, the Target System offers truly transparent and uncoloured reproduction.

Built-in Processing

As well as providing the processing for directivity control, the 32 bit floating point DSP in each unit offers a wealth of features including Volume control, 8 Band Parametric Equalisation and Delay. Parameters are adjusted using JBL Professional® WinControl, our proprietary DSP control software and uploaded to the non-volatile memory in each unit, via the RS-485 network (see page 6 for further information).

Self Powered

In addition to built-in processing, each loudspeaker is driven by an on-board, dedicated class AB amplifier, with a sophisticated switch mode power supply. All of which combines to ensure easy installation and years of reliable operation.

Scaleable

Unlike traditional 'Line Arrays' the JBL Professional® Target system is truly scaleable. It isn't limited to a minimum array length as each unit has a wide opening angle as standard. This allows a single unit to be used on its own, or as part of a DDS controlled array. The DDS processing also gives you the power and flexibility to build cardioid bass arrays, logarithmically or double spaced bass arrays and end-fire arrays.

Stackable

A further benefit of the JBL Professional® Target system is the choice of flying or ground stacking an array. Add to this the fact that any directivity adjustment and fine tuning is then applied digitally and you have an extremely flexible and easy to install system for any sized application or venue.

Predictable

To ensure the optimum installation and adjustment, JBL Professional® DDA (Digital Directivity Analysis) software has been developed to predict the performance of the Target System and then simulate the results as a dynamic 3-D visualisation (see page 7 for further information).

JBL Professional® DDS provides more options for control of lower frequencies. Using the B-215 bass unit, end-fire, cardioid, logarithmically or double spaced bass arrays can be created.

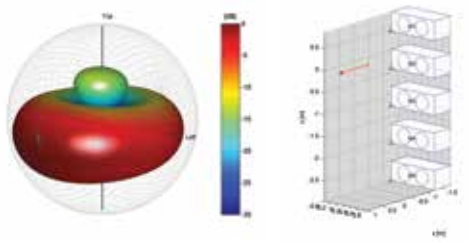
1. Logarithmically and double spaced bass arrays.

To gain control over the directivity at low frequencies you can't escape the fact that you physically need a long array to control long wavelengths. Traditionally, large bass arrays have had several limiting factors, including: equipment costs, due to the amount of loudspeakers required and rigging costs, due to system size and weight.

DDS now offers a solution; by 'double spacing' or 'logarithmically spacing' the Target B-215s you can create longer arrays using less units making directivity control at low frequency a more practical solution.

Using the DDS algorithms it is then possible to produce the desired radiation pattern from the array and to make the bass throw further!

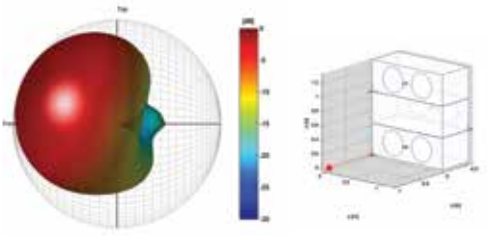
DDS also gives you the power to combine these concepts for even more control.



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

2. Cardioid Bass Arrays.

The principle of a cardioid bass array is not new. However, DDS offers users greater flexibility and control over cardioid setups. When you take into account the exact positions of the drivers and their directivity, DDS gives you ultimate control across the frequency range of the device. Cardioid arrays are particularly useful outdoors to reduce environmental pollution and are a great tool when you need to reduce the amount of bass energy being projected onto the stage within an auditorium.

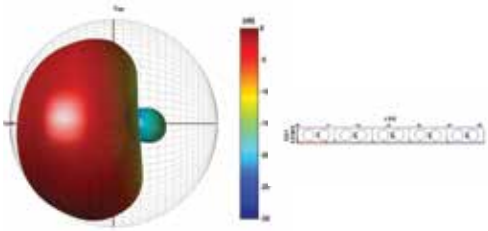


Example 3D Directivity balloon for a B-215 Cardioid Bass Array

3. End-fire Bass Arrays.

Using DDS, a collection of B-215 devices can be optimized to exhibit 'end-fire' directivity behaviour.

The end-fire topology combines the advantages of a constrained vertical as well as horizontal opening angle with reduced backwards radiated energy. This can be an effective solution for reducing spill onto stage or reducing noise pollution at open air events.



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

DDS Technology Explained

Perhaps the most revolutionary development of recent years in electro-acoustics is the JBL Professional® DDS (Digital Directivity Synthesis) technology. Delivering an acceptable coverage of a venue is often achieved by the empirical clustering of 'conventional line-array' elements. In order to eliminate this guesswork, the DDS technology has been developed to optimise the directivity of an array, according to room and audience area geometry. DDS can be thought of as reversing the traditional process. The directivity pattern is calculated, starting with the desired coverage and then working backwards to the given array configuration. This results in the best possible fit with a maximum Direct to Reverberant Ratio for any given situation.

DDS not only enables system designers to define what area to cover but also to define areas that should be avoided, minimizing unwanted reflections. This is invaluable in controlling attributes such as stage-feedback or suppressing rear wall reflections.

The JBL Professional® Target System

JBL Professional® Target T-2820

The Target T-2820's high frequency section comprises of 2 x 1.4 inch high sensitivity compression drivers mounted onto specially designed high impedance flares. The horn-loaded mid range comprises of 2 x 10 inch low distortion/ high efficiency transducers. The drive and control for these devices is provided by the built-in amplification and DSP.

Short Form Specifications

		Target-T-2820 (mid-hi unit)	Target B-215 (bass unit)
Acoustical:			
Freq range		120 - 18k Hz (+/-3 dB / single element)	45 - 300 Hz (+/-3 dB / single element)
Max SPL	Continuous	135 dB_{SPL} @ 1 meter with pink noise	130 dB_{SPL} @ 1 meter with pink noise
Coverage	Horizontal Vertical Vertical (adjustable) Horizontal (adjustable)	90° (fixed) 40° (single element) Defined by array shape and DDS algorithm -	300° (single element) 300° (single element) Defined by array shape and DDS algorithm Defined by array shape and DDS algorithm
Dynamic range		>104 dB	>104 dB
Electrical:			
Audio Input	Nominal level Max level Type Impedance (balanced) Connector	0 dBV +18 dBV (peak) twin transformer balanced 32k Ω Ω 3-pin XLR type + hard wired output link	0 dBV +18 dBV (peak) twin transformer balanced 32k Ω 3-pin XLR type + hard wired output link
Power amps	Type Power	Class AB 4 x 370 W_{rms} (8 Ω)	Class AB 2 x 400 W_{rms} (8 Ω)
Mains	Voltage Power consumption Connector	100 V to 250 V, 50 or 60 Hz 60 VA (idle) / 1000 VA (full load)** PowerCon + link output	100 V to 250 V, 50 or 60 Hz 60 VA (idle) / 1000 VA (full load)** PowerCon + link output
General:			
Temperature range (ambient)		0 to 40 ° C	0 to 40 ° C
Transducers		2 x 1.4" (horn-loaded compression driver) 2 x 10" (horn-loaded)	2 x 15" (front-loaded bass-reflex)
Dimensions (H x W x D)		460 x 1240 x 554 mm (18" x 49" x 22")	460 x 1240 x 554 mm (18" x 49" x 22")
Default colour		Dark Blue	Dark Blue
Weight		83 kg (183 lbs)	86 kg (190 lbs)

* This specification is valid for units with the UniAmp700 electronics module.
** Typical maximum value under normal operating conditions.
*** Excluding rigging system.

AXYS® Target B-215

The Target B-215 is designed to compliment both the Target T-2820 and Target U-16, providing accurate low frequency response. Each B-215 comprises of 2 x 15 inch high power large excursion transducers. The cabinet tuning has been defined using output impedance control techniques. The drive and control for these devices is provided by the built-in amplification and DSP.

Target U-16 (mid-hi unit)*
160 - 20k Hz (+/-3 dB / single element)
123 dB_{SPL}@ 1 meter with pink noise
90° (fixed) 90° (single element) Defined by array shape and DDS algorithm -
>104 dB
0 dBV +18 dBV (peak) twin transformer balanced 32k Ω 3-pin XLR type + hard wired output link
Class AB 1 x 530 W_{rms} (4 Ω), 1 x 200 W_{rms} (8 Ω)
100 V to 250 V, 50 or 60 Hz 50 VA (idle) / 700 VA (full load)** PowerCon + link output
0 to 40 ° C
1 x 1" (horn-loaded compression driver) 2 x 6.5" (direct radiating)
200 x 475 x 300 mm (8" x 19" x 12")***
Dark Blue
25 kg (55 lbs)

JBL Professional® Target U-16

The Target U-16 uses a vertical slot diffraction HF horn which is coupled to the state-of-the-art 1" neodymium compression driver. Result: high sensitivity and extremely dynamic and transparent sound reproduction. The narrow horizontal outline of the HF horn allows close spacing of the 6.5" low-mid drivers eliminating interference resulting in a smooth horizontal radiation pattern. The drive and control for these devices is provided by the built-in amplification and DSP.

JBL Professional® Target DSP Board features

DSP	900 MFLOPS 32bits
Auxiliary processor	200 nsec single cycle RISC
Memory	64 Mb SDRAM + 3 Mb non volatile
AD – DA conversion	24 bits sigma-delta 128 x over sampling
Sample rate	determined by DSP software
Network	full duplex RS-485 galvanically isolated
Configuration	parallel connection max 126 users per subnet
Baudrate	19k2 Baud to 115k2 Baud
Connector	5pin XLR type + link output
Indicators	mains voltage switched on surveillance status OK LED unit identification LED (on front)

Surveillance features

- Load monitoring on all channels (short / open circuit)
- Pilot tone detection on line input (20k Hz – 30k Hz)
- Status monitoring power amplifiers
- Temperature monitoring heatsink + power reduction scheme
- Fan speed monitoring
- DSP processing (software watchdog)
- RISC processing (hardware watchdog)
- Real time clock including 5 months power backup

Signal Processing

- Volume Control
- 8 band parametric EQ
- Delay, up to 42 seconds

Rigging Options

JBL Professional® Target T-2820 / B-215

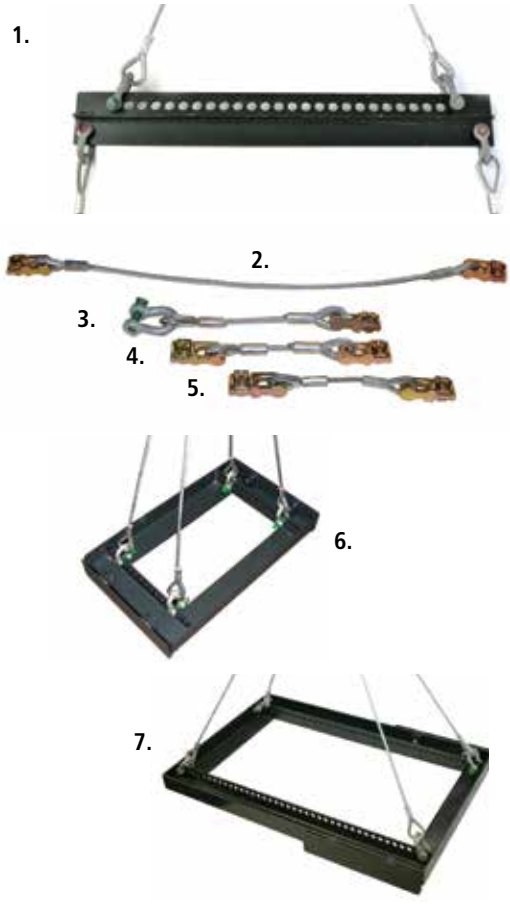
The JBL Professional® Target T-2820 and B-215 are supplied with integrated rigging tracks, the optional rigging accessories available are:

1. Rigging Bar, Part # 828501
2. Rigging Strap 560 mm Ø6 mm, Part # 808456
3. Rigging Strap single ended 200 mm Ø6 mm, 90° Part # 808420
4. Rigging Strap 141 mm Ø6 mm, Part # 808414
5. Rigging Strap 141 mm Ø5 mm, Part # 808314

JBL Professional® Target-U16 rigging

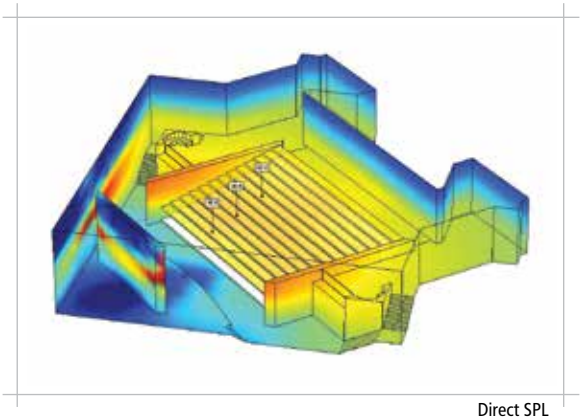
The JBL Professional® Target U-16 is supplied with an integrated rigging system allowing units to be linked together. The optional top-frames available are:

6. Target-U16 Bumper (300 mm deep), Part # 8212289
   This bumper is designed to be used with U-16 systems which require no mechanical aiming (i.e. dead hung).
7. Target U-16 Bumper (750 mm deep), Part # 8212288
   This bumper is designed to be used with U-16 systems which require mechanical aiming.

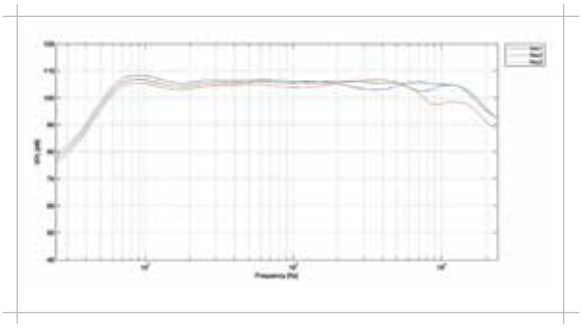


JBL Professional® DDA

the Digital Directivity Analysis (DDA) software package has been developed as a user interface to gain access to the powerful DDS algorithms. It offers the user an intuitive way to optimize the performance of the Target System as well as to simulate and illustrate the results in a dynamic 3-D visualization. DDA includes statistical STI prediction as well as extensive capabilities to import room geometry and export directivity data. The DDA software optimizes the DSP coefficients for each individual transducer of any Target array configuration while simultaneously calculating the optimum cross-over transfer functions.



Direct SPL

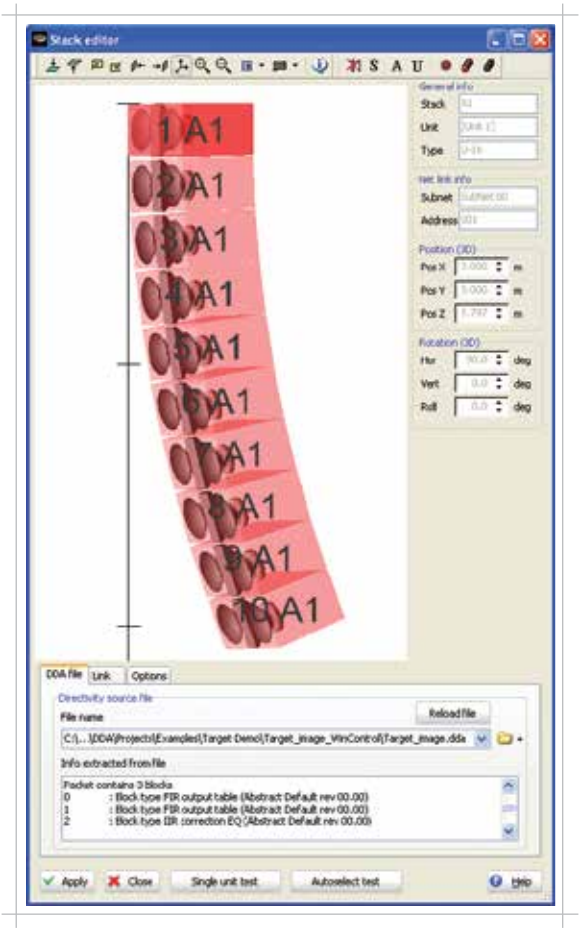


Direct Sound Frequency Response

JBL Professional® WinControl

JBL Professional® Target products are controlled with WinControl, another software package that has been developed in-house. This program offers the user extensive control over the many DSP features integrated into the system. All Target units are addressable through the proprietary RS-485 network connection giving the user full on-site access to the system once hooked up to a PC running WinControl. WinControl interfaces seamlessly with the DDA software and imports the array configuration with the optimized parameters. After importing the DDA files, a dynamic graphical representation of the array configuration is displayed on screen allowing the user to intuitively "point and shoot" the assignment of each unit based on its physical position. This process is then finalized by uploading the appropriate DSP coefficients to each individual Target unit.

WinControl provides a wealth of control over audio processing modules executed by the DSP in each Target unit. In addition to this, WinControl also offers extensive status monitoring and logging facilities.



The JBL Professional® Target System represents the result of 20 years self-powered touring system development and 10 years of research into Directivity Control and Synthesis. The JBL Professional® Digital Directivity Synthesis (DDS) technology that has revolutionised the PA/VA market in the JBL Professional® Intellivox series, is finally available to the touring market.

The JBL Professional® Target System is a fully scalable, Front of House, array system, which uses JBL Professional® DDS technology to optimise the beam shape and SPL coverage for a predefined listening space. Full bandwidth, even SPL can now be achieved across a venue without over exciting the nearfield areas.

The JBL Professional® Target System is capable of generating SPLs exceeding the pain threshold, so it takes discipline to operate. No longer is it necessary to deafen the people in the nearfield, to reach the listeners at the back. The JBL Professional® Target system has it covered.



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