LSR32 Linear Spatial Reference Studio Monitor System

Key Features:

- Linear Spatial Reference design based on spatial response measurements and psychoacoustic principles.
- Differential Drive® Technology with dynamic braking for extended low frequency response and low power compression.
- Neodymium Midrange with 2" voice coil and Kevlar™ cone material for extended frequency response and low distortion.
- Titanium Composite High Frequency Device with Elliptical Oblate Spheroidal Waveguide and Damped Pole Piece.
- Carbon Fiber Composite Baffle for low cabinet resonance and stable inertial ground.
- Linear Dynamics Aperture Port Design eliminates port noise and reduces port compression.

The LSR32 Linear Spatial Reference Studio Monitor combines JBL's latest in transducer and system technology with recent breakthroughs in psychoacoustic research to provide a more accurate studio reference.

The Linear Spatial Reference (LSR) philosophy is based on a set of design goals that carefully control the overall performance of the system in a variety of acoustic spaces. Instead of focusing on a simple measure such as on-axis frequency response, LSR designs require much better control over dispersion via transducer selection and crossover frequency design. Critical decisions of image placement, EQ, balance and timbre are typically made within +/- 15° vertically and +/- 30° horizontally. This workspace is where the engineer, producer and artist make critical mixing decisions and this is the area that LSR is optimized for superb in room response. By incorporating LSR into the system design requirements, placement rules are relaxed, a more stable image is maintained and off-axis coloration is minimized.

252G Low Frequency Transducer

The neodymium 12" woofer is based on JBL's patented Differential Drive® technology. With the Neodymium structure and dual drive coils, power compression is kept to a minimum to reduce the fatigue of spectral shift as power levels increase. An added third coil between the drive coils acts as a dynamic brake to limit excess excursion and reduce audible distortion at the highest levels. The cone is made of a graphite/polypropylene composite forming a rigid piston supported by a soft butyl rubber surround.

C500G Midrange Transducer

The midrange is a 2" neodymium magnet structure with a woven 5" Kevlar™ cone. The powerful motor structure was chosen to support the low crossover point to the woofer. In order to achieve the goal of accurate spatial response the crossover points are located at 250 Hz and 2.2 kHz. These transition points were chosen to match the directivity characteristics of the three transducers.

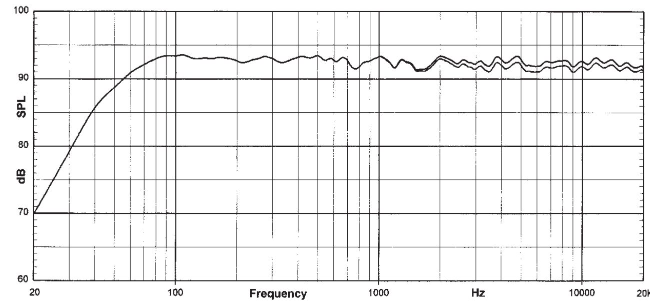
053ti High Frequency Transducer

The high frequency device is a 1" composite diaphragm integrated with an Elliptical Oblate Spheroidal (EOS) Waveguide with 60 x 100 degree dispersion which is critical to the smooth spatial response required in today's working environments. The Mid and High devices are mounted within millimeters of each other on a cast aluminum sub-baffle that can be rotated for horizontal or vertical placement giving maximum flexibility in placement to reduce console and ceiling splash that destabilizes imaging and depth.

Dividing Network

The impedance compensated crossover filters are optimized to yield 4th-order (24dB/octave) Linkwitz-Riley electroacoustic responses from each transducer (in phase; -6dB at crossover). In order to achieve optimal symmetrical response in the vertical plane, both magnitude and phase compensation are implemented in the crossover network. The crossover network allows the user to adjust the high frequency level above 3 kHz. This allows the listener to compensate for effects of nearfield or midfield spectral balance. Components used in the crossover are exclusively low-loss metal film capacitors; low distortion electrolytic capacitors; high-Q, high saturation current inductors and high current sandcast power resistors.

HF Adjustment Flat and -1 dB Settings



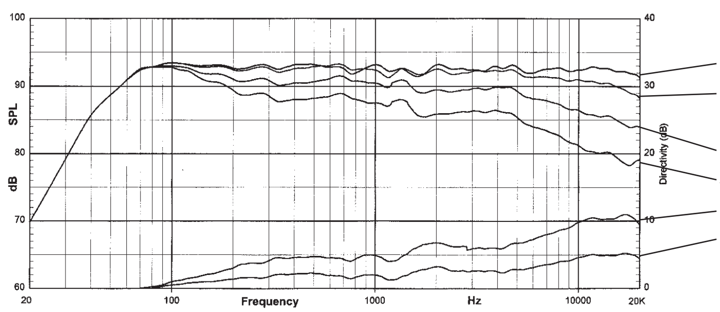
LSR Measurement Techniques

LSR is the underlying design philosophy that explains why speakers that measure the same, sound different. By going beyond simple on-axis frequency measurement, LSR techniques define the ultimate performance specifications of our monitoring technology—what it will sound like in your room. We go beyond the performance of an on-axis frequency response at one point in space, which other manufacturers use.

LSR uses a technique of measuring a monitor over a sphere that encompasses all energy radiated into the listening room in every direction. This data reflects 1296 times the information of a single on-axis frequency response curve. Using psychoacoustic principles allows the calculation and optimization of the entire sound field heard by the listener - this includes the direct sound field, the reflected sound field and the reverberant sound field. In place of spectral smoothing, which actually conceals data, LSR techniques expose flaws in systems such as resonances, poor dispersion and other off-axis colorations.

The LSR graphic below is a set of Spatially Measured graphs that are at the heart of the LSR philosophy.

LSR32 Response Curves

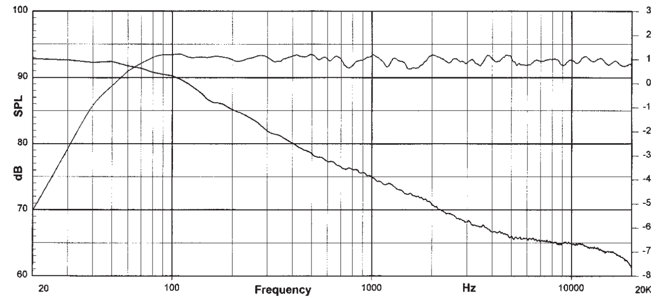


1. On-Axis Response
2. Spatially Averaged Response over a range of +/- 30° Horizontal & +/- 15° Vertical
3. First Reflection Sound Power
4. Total Radiated Sound Power
5. DI of On-Axis Response
6. DI of First Reflections

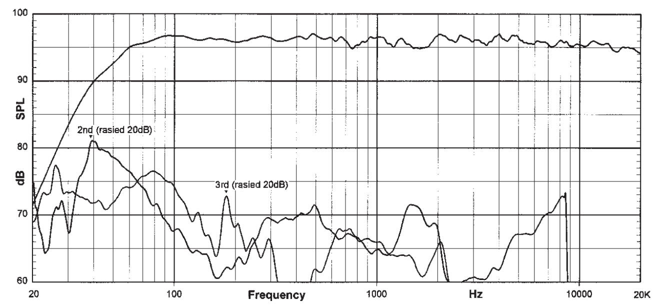
Specifications:

System:	
Input Impedance (nominal):	4 ohm
Anechoic Sensitivity:[1]	93 dB/2.83V/1m (90 dB/1W/1m)
Frequency Response (60 Hz - 22 kHz)[2]:	+1, -1.5
Low Frequency Extension[2] -3 dB: -10 dB:	54 Hz 35 Hz
Enclosure resonance frequency:	33 Hz
Long Term Maximum Power (IEC 265-5):	200 W Continuous; 800 W Peak
Recommended Amplifier Power:	150 W - 1000 W (rating into 4 ohm load)
HF Frequency Control (2.5 kHz - 20 kHz):	0 dB, -1 dB
Distortion, 96 dB SPL, 1m:[3] Low Frequency (below 120 Hz): 2nd harmonic: 3rd harmonic:	< 1.5% < 1 %
Mid & High Frequency (120 Hz - 20 kHz): 2nd harmonic 3rd harmonic	< 0.5% < 0.4%
Distortion, 102 dB SPL, 1m:[3] Low Frequency (below 120 Hz): 2nd harmonic: 3rd harmonic:	< 1.5% < 1%
Mid & High Frequency (80 Hz - 20 kHz): 2nd harmonic: 3rd harmonic:	< 1 % < 1 % (N.B: < 0.4%, 250 Hz - 20 kHz)
Power Non-Linearity (20 Hz - 20 kHz): 30 watts 100 watts:	< 0.4 dB < 1.0 dB
Low - Mid Frequency Crossover: 4th order Acoustic Linkwitz-Riley:	250 Hz
Mid - High Frequency Crossover: 4th order Acoustic Linkwitz-Riley:	2.2 kHz
Transducers:	
Low Frequency Model:	252G
Diameter:	300 mm (12 in.)
Voice Coil:	50 mm (2 in.) Differential Drive with Dynamic Braking Coil
Magnet Type:	Neodymium
Cone Type:	Carbon Fiber Composite
Impedance:	4 ohm
Mid Frequency Model:	C500G
Diameter:	125 mm (5 in.)
Voice Coil:	50 mm (2 in.) Aluminum Edge Wound
Magnet Type:	Neodymium
Cone Type:	Kevlar™ Composite
Impedance:	4 ohm
High Frequency Model:	053ti
Diameter:	25 mm (1 in.) diaphragm
Voice Coil:	25 mm (1 in.)
Magnet Type:	Ceramic 5
Diaphragm Type:	Damped Titanium Composite
Other Features:	Elliptical Oblate Spheroidal Waveguide
Impedance:	4 ohm
Physical:	
Finish:	Black, Low-Gloss, "Sand Texture"
Enclosure Volume (net):	50 liter (1.8 cu. ft.)
Input Connectors:	5-way binding posts.
Input Features:	Bi-wirable
Net Weight:	21.3 kg (47 lbs)
Dimensions (WxHxD):	63.5 x 39.4 x 29.2 cm (25.0 x 15.5 x 11.5 in.)

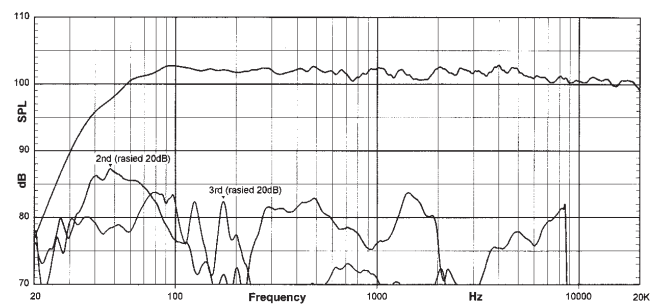
Amplitude & Phase



96 dB/1 m (Distortion raised 20 dB)



102 dB/1 m (Distortion raised 20 dB)



Notes:

All measurements unless otherwise stated made anechoically at 2 meters and referenced to 1 meter by the inverse square law.

The reference measurement microphone position is located perpendicular to the centerline of the mid and high frequency transducers, at the point 55 mm (2.2 in.) below the center of the tweeter diaphragm.

[1]Mean SPL level from 100 Hz to 20 kHz.

[2]Describes Anechoic (4π) low frequency response. Acoustic Loading provided by the listening room will increase low frequency bass extension.

[3]Distortion measurements performed with the input voltage necessary to produce the stated "A" weighted SPL level at the stated measurement distance. Distortion figures refer to the maximum distortion measured in any 1/10th octave wide band in the stated frequency range.

[4]Power Non-Linearity figures based on the "A" weighted deviation from linear increase in SPL with linear increase in input power (ie: power compression) measured after 3 minutes of continuous pink noise excitation at the stated power level.

JBL continually engages in research related to produce improvement. New materials, production methods, and design refinements are introduced into existing products without notice as a routine expression of that philosophy. For this reason, any current JBL product may differ in some respect from its published description, but will always equal or exceed the original design specifications unless otherwise stated.

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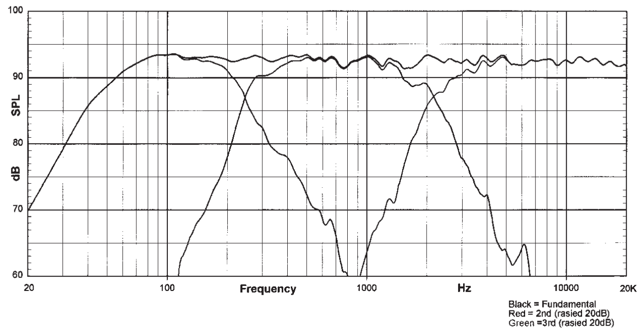
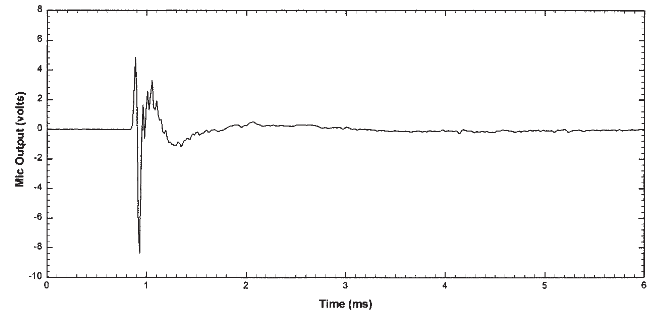
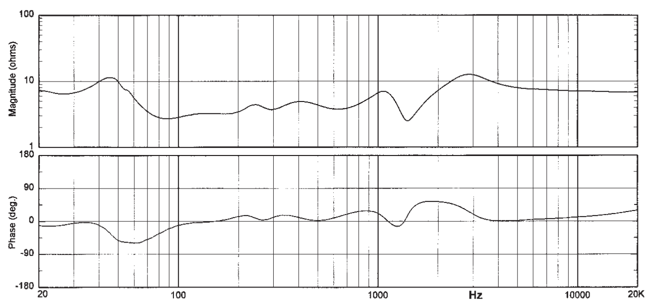
Acoustic Contribution



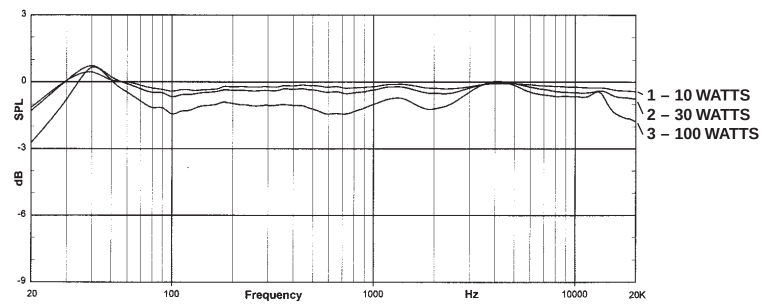
Impulse Response



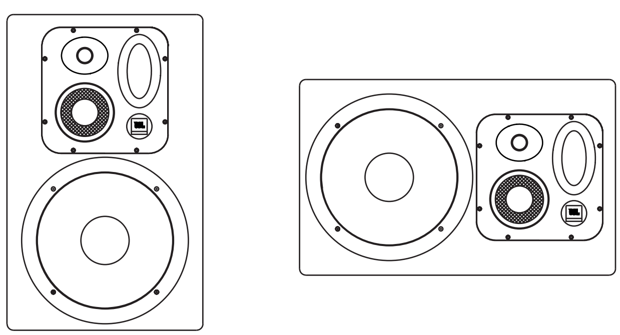
System Impedance



Power Compression



Horizontal And Vertical Orientation



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