



Engineering Test and Performance Specification

Model Number: 1501AL
Part Number: 362330-001
Description: 15 inch, Alnico, High Power woofer/subwoofer with very low Distortion
Division: JBL - Harman Japan
Where Used: Everest II

Approved Supplier: JBL Pro Manufacturing

Design Engineer: Jerry Moro

Revision: **B**

9/11/2006

Engineering Test and Performance Specification

Purpose:

To define and establish a reference for the JBL Engineering approved performance characteristics of the stated model. To define the type of testing, and minimum conditions for testing, of production units of the stated model. To insure that the JBL design and performance intent is met. The performance data contained in this document is taken from the JBL Engineering Reference Standard unit that is held in the Harman Northridge facility.

This document is a JBL Engineering specification only and does not attempt to establish AQL or Visual acceptance levels or other criteria that are set forth and enforced by the Customer Purchasing, Incoming Inspection, and Quality Assurance groups.

Contents:

1) Physical and Mechanical Specifications

2) Engineering Test Specification (ETS)

Defines minimum testing for production units and response variation tolerance

3) Performance Specification

T/S Parameters

Frequency Response

Harmonic Distortion

Impedance

Physical and Mechanical Characteristics

Model #	1501AL	NMG Part #	362330-001
Description:	15 inch, Alnico, High Power woofer/subwoofer with very low Distortion		

Frame Type:	Heavy Cast Aluminum	Frame Finish:	Powder Coat, Charcoal
Outer Dia.	15.25 inches	Mounting Depth:	9.0 inches
Mounting Dia:	13.75 inches	Overall Height:	9.875 inch

Trim Ring:	Type: Aluminum clamp ring	Color:	Black
Surround:	Type: EPDM Foamed Rubber	Color:	Black
Cone:	Type: Aquaplas/Paper Pulp	Color:	Black
Dome:	Type: Compressed Paper	Color:	Black

Front Gasket:	Type: None	Color:	n/a
Rear Gasket:	Type: None	Color:	n/a
Tinsel Lead	Type: SilverPlateCadCopper-twisted	Attachment:	Soldered to Cone Eyelets
Terminal:	Type: Dual 5-way Binding posts	Lug Size:	n/a
	Polarity: EIA STND - Positive applied to RED terminal moves cone away from magnet		

Voice Coil:	Diameter: 4 inch	Wire:	Aluminum Ribbon 1.0414 x .16418mm, Edge wd.
	Layers: 1	Former:	High temp .007in thk Fiberglass
	Turns: 164	Wrapper:	High temp NEC - 2 layers
	Winding Length : 1.20 inch		

Top Plate:	Thickness: 1.60 inches		
Primary Magnet:	Type: ALNICO 5DG	OD:	3.82 inch w/vents
Bucking Magnet:	Type: n/a	OD:	n/a
Shield Can:	Yes or No n/a	OD:	n/a
		Thickness:	2.0 inch
		Thickness:	n/a
		Thickness:	n/a

Notes: Design is "underhung" type with short coil and long gap height. Incorporates JBL Flux Stabilization rings within gap area, and at base of structure. Dual, mirror image spiders are also used to reduce distortion.

Model 1501AL	Engineering Test Specification	Document Number 363290	Rev B
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1. Model Description: 15 inch, Alnico, High Power woofer/subwoofer with very low Distortion
 Model Part # **362330-001** Design Engineer: **Jerry Moro**
 (Part # listed is S/M level for systems and M/T level for transducers)
 Shipping Weight: **approx 40 IBS** Packaging Test Method:

2. Dynamic Test: (100% test) Input Voltage (@ lowest sweep range): **40vrms at 20hz,35vrms sweep**
 Sweep Range: **20 - 400hz** Sweep Duration: **4 seconds**

3. Power Test-Production Audit of 6 pcs @ each run: (Must EPR Qualify at 100 hours@same spec)
 Input Signal: **Pink Noise** Filter: **50-500hz**
 Crest Factor: **6 dB** Duration (hours): **2 hrs** Input Voltage: **68.0 Vrms**

4. Impedance: (Ref only) D.C. Resistance: **9.2 ohms**
 Rated Impedance: **12.0 ohms** Min.Impedance: **11.7 ohms** Motional Impedance: **300.0 ohms**
 Thiele-Small; See: Impedance Curve; See:

5. Polarity: (Automatically checked 100% during Canetics test): EIA STANDARD
 EIA = + volt. to + term. gives forward cone movement; phase detector green; JBL = + volt. to + term. gives reverse movement, phase detector red.
 For System only (this section not applicable to transducers alone):
 Description: Polarity:
 Driver 1:
 Driver 2:
 Driver 3:

6. Frequency Response Test: (100% test)
 Mic Position (inches): X: Y: Z: X=vert., Y=Horiz., Z = Dist from baffles. 0,0,0 = lower left corner facing spine front
 Crossover Frequencies (System Ref):
 Canetics File Name Test Voltage
 Stimulus File Gate Length Pregate Length
 Number of Stacks Mic Distance Max Noise

Channel 1	Frequency		Bins Per Octave	Rolloff dB/Octave	Tolerance	
	Start	Stop			Upper	Lower
Group 1	60 Hz	640 Hz	6	36	1.0 dB	1.0 dB
Group 2	718 Hz	1016 Hz	3	36	1.5 dB	1.5 dB
Group 3	1140 Hz	2560 Hz	3	36	2.0 dB	3.0 dB
Group 4						
Group 5						
Group 6						
Group 7						
Group 8						

Note: Group ranges listed per OE1004, rev B. Frequencies shown are effective ranges of groups(s).

7. Other:

Signatures
 Marketing: _____ Date _____ Proc. Eng: _____ Date: _____
 Mfg Engr.: _____ Date _____ Dev. Engr.: Jerry Moro 6-20-06 Date: _____
 QA Lab: _____ Date _____

Revision History

Rev	Release Action	Date	Rev Initials
A	Release for Production	6/6/2006	JM
B	Change Canetics Test windo groups # 1, 2, 3 and eliminate group 4	9/11/2006	JM

T/S Parameters

Model # 1501AL NMG Part # 362330-001
Description: 15 inch, Alnico, High Power woofer/subwoofer with very low Distortion

Fundamental Resonant Frequency:	Fs	27	+/-	10%
Transducer Direct Current Resistance:	DCR	9.2	+/-	105%
Total Driver Q at Fs, Considering all driver Resistance:	Qts	0.30		
Moving Mass:	Mms	145	+/-	10%
Motor Strength:	Bl	27	+/-	5%
Voltage Sensitivity(2.83V@1 meter)	SPL	92	+/-	1.0 dB

Magnetic Flux information: (For Engineering Reference ONLY)

Total Flux lines intercepted by Coil Windings [Maxwell turns]: 501,774
Conversion to Flux Density [Tesla]: 0.521

Flux lines throughout Gap thickness [Maxwell turns]: 674,632
Conversion to Flux Density [Tesla]: 0.528

Method; MLSSA added MASS

Notes; Flux measured with a Search coil

1501AL Frequency Response, 2.83Vrms @ 1Meter

SPL vs Freq



Map

0: 1501AL, Rev.A03, Meter 500cm@1.29

Notes

LMS

4.5.0.351
Feb/11/2005

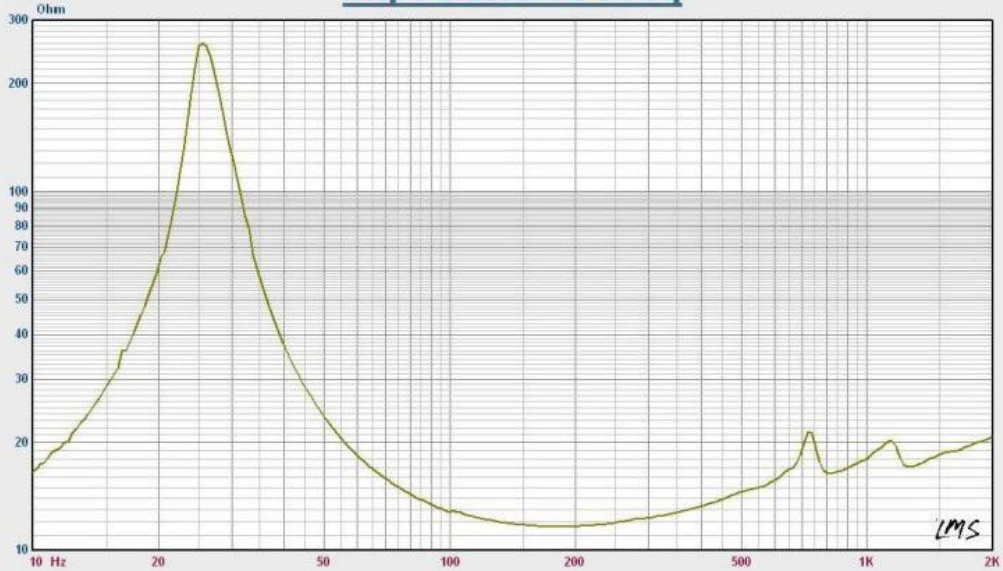
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Company:

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Mar 13, 2006
Mon 10:10 am

LINEAR X
S Y S T E M S

Impedance vs Freq



LMS

Map

8: 1501AL Res AW3, 11.853Ohms Min Z, Motor 500km@1.29

Notes

LMS

4.5.0.351
Feb/11/2005

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Company:

Project:
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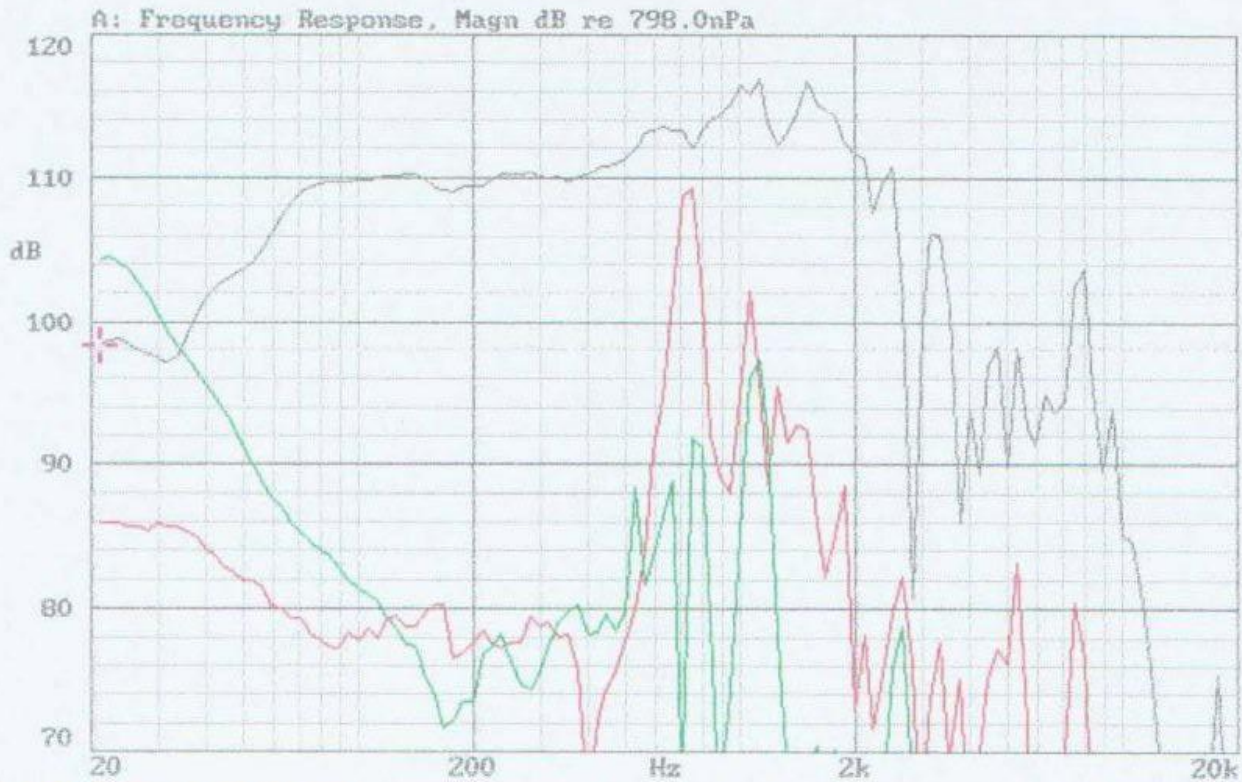
Mar 13, 2006
Mon 10:11 am

LINEAR X
S Y S T E M S

1501AL Harmonic Distortion

2nd and 3rd Harmonic distortion raised 20dB relative to Fundamental

X:21.135Hz *Y:98.39dB* ZA:1.0000 SSR fund.



01-NOV-2005 10:23:31 AM

Mode: 283 HARM



MLSSA SPO 4WI #010227-3479-3488 for Harman Consumer Group

Measured Parameters

QC Limits

Line	Parameter	Value	Units
1	RMSE-free	1.73	Ohms
2	Fs	27.51	Hz
3	Re	9.13	Ohms
4	Res	349.11	Ohms
5	Qms	11.78	
6	Qes	0.31	
7	Qts	0.30	
8	L1	0.10	mH
9	L2	3.01	mH
10	R2	13.78	Ohms
11	RMSE-load	1.11	Ohms
12	Vas(Sd)	243.72	liters
13	Mms	149.38	grams
14	Cms	224	$\mu\text{M}/\text{Newton}$
15	B1	27.66	Tesla-M
16	SPLref(Sd)	93.4	dB[8 ohms]
17	Rub-index	0.00	

 $R_{me} = 83.79$

Method: Mass-loaded (200.000 grams)
 DCR mode: Fixed (9.64 - 0.51 ohms)

Area (Sd): 880.00 sq cm
 QC file: CLOSED

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