



**Eighteen Sound
an AEB S.r.l. Company**

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Application Note #8:

Building an effective, high power manifolded Double 18" Band-Pass subwoofer

Eighteen Sound Technical Department
July, 2009



Manifolded Double 18" Band-Pass Subwoofer kit

- High performance 2 x 18" subwoofer system
- works exclusively with 18NLW9600 or 18NLW9600C, making a lightweight box with extremely high power handling

• **18NLW9600** subwoofer key features are:

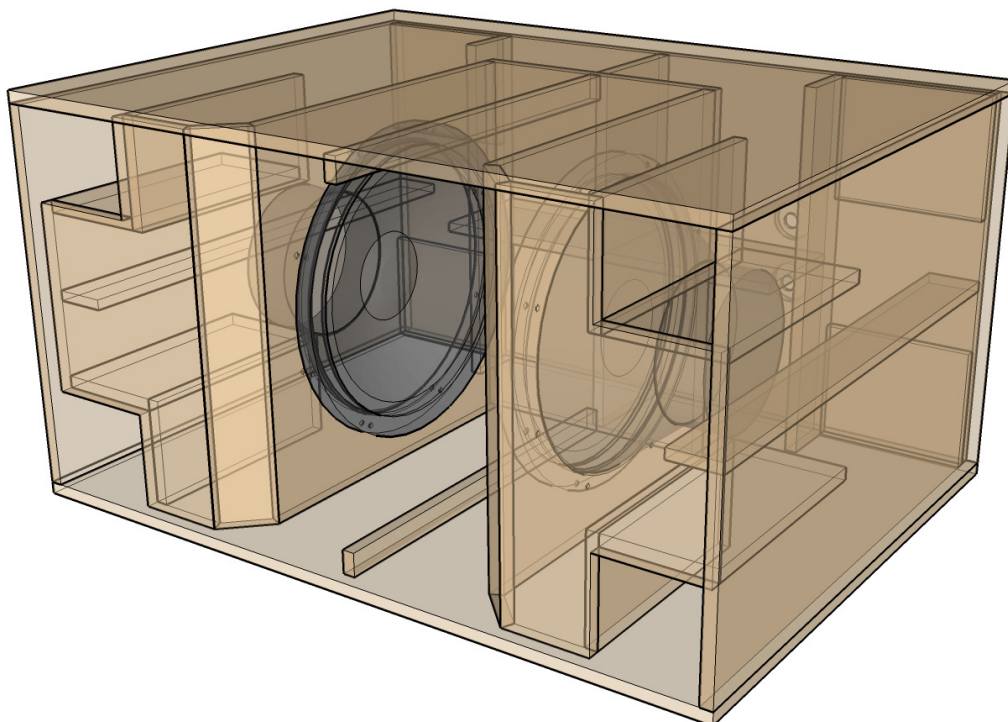
Powerful neodymium magnet

5.3" Interleaved Sandwich Voice coil (ISV)

Triple Silicon Spider (TSS)

Double Demodulating Rings (DDR)

1800W AES power handling





Manifolded Double 18" Band-Pass Subwoofer kit

18NLW9600



GENERAL SPECIFICATIONS

NOMINAL DIAMETER	462mm (18 in)
RATED IMPEDANCE	8 ohms
AES POWER	1800W
PROGRAM POWER (1)	3600W
PEAK POWER (2)	10000W
SENSITIVITY (3)	96,5 dB
FREQUENCY RANGE (4)	32 – 2500 Hz
POWER COMPRESSION @ -10 DB (5)	0.7 dB
POWER COMPRESSION @ -3 DB	1.3 dB
POWER COMPRESSION @ 0 DB	2.2 dB
MAX RECOMM. FREQUENCY	300 Hz
RECOMM. ENCLOSURE VOLUME	110 ÷ 350 lt. (3,88 ÷ 12,36 cuft)
MINIMUM IMPEDANCE	6,6 ohms at 25°C
MAX PEAK TO PEAK EXCURSION	70 mm (2,75 in)
VOICE COIL DIAMETER	135 mm (5,32 in)
VOICE COIL WINDING MATERIAL	aluminum
SUSPENSION	Triple Roll Polycotton
CONE	Straight Ribbed, Treated Paper

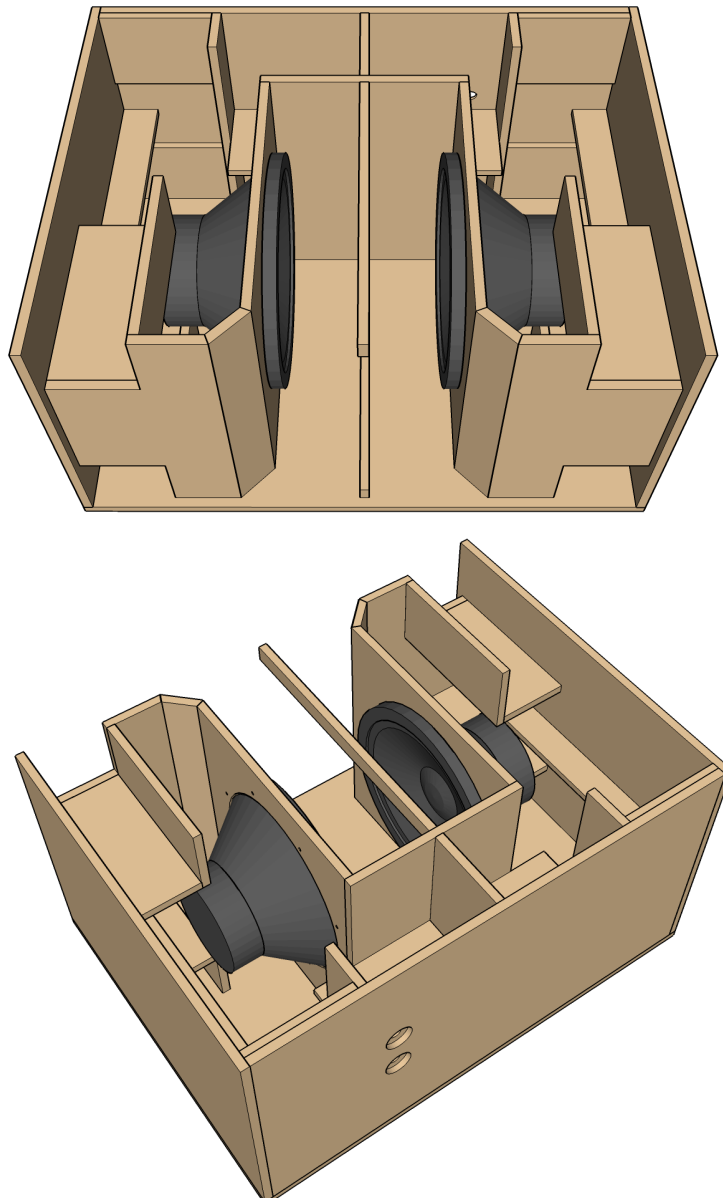
THIELE SMALL PARAMETERS (6)

Fs	34 Hz
Re	4,7 ohms
Sd	0,1134 sq.mt. (189,9 sq.in.)
Qms	8,7
Qes	0,29
Qts	0,28
Vas	149 lt. (5,1 cuft)
Mms	261 gr. (0,58 lb)
BL	30 Tm
Linear Mathematical Xmax (7)	±14 mm (±0,55 in)
Le (1kHz)	2,11 mH
Ref. Efficiency 1W@1m (half space)	95,1 dB

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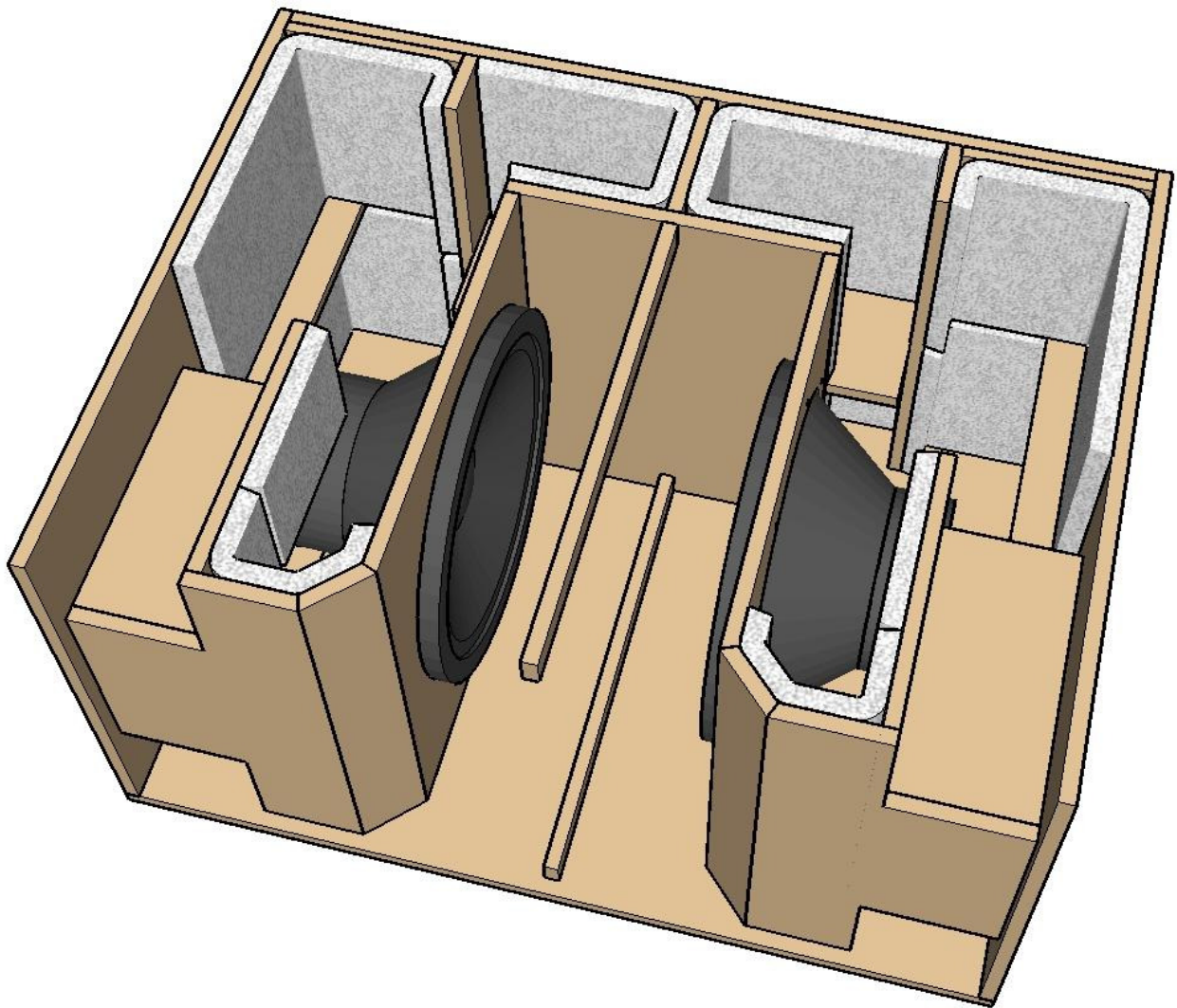
- The enclosure should be made of baltic birch plywood (18mm thickness)
- Bolts are M6x35mm
- M6 T-Nuts are recommended
- Handling, rigging and connectors are user's choice
- It's recommended to well damping the cabinet interior
- You should see an example of the required dampening on the image on the next page
- An high density dampening material, such as Dacron or other synthetic fibers, is required for better performance

Internal view

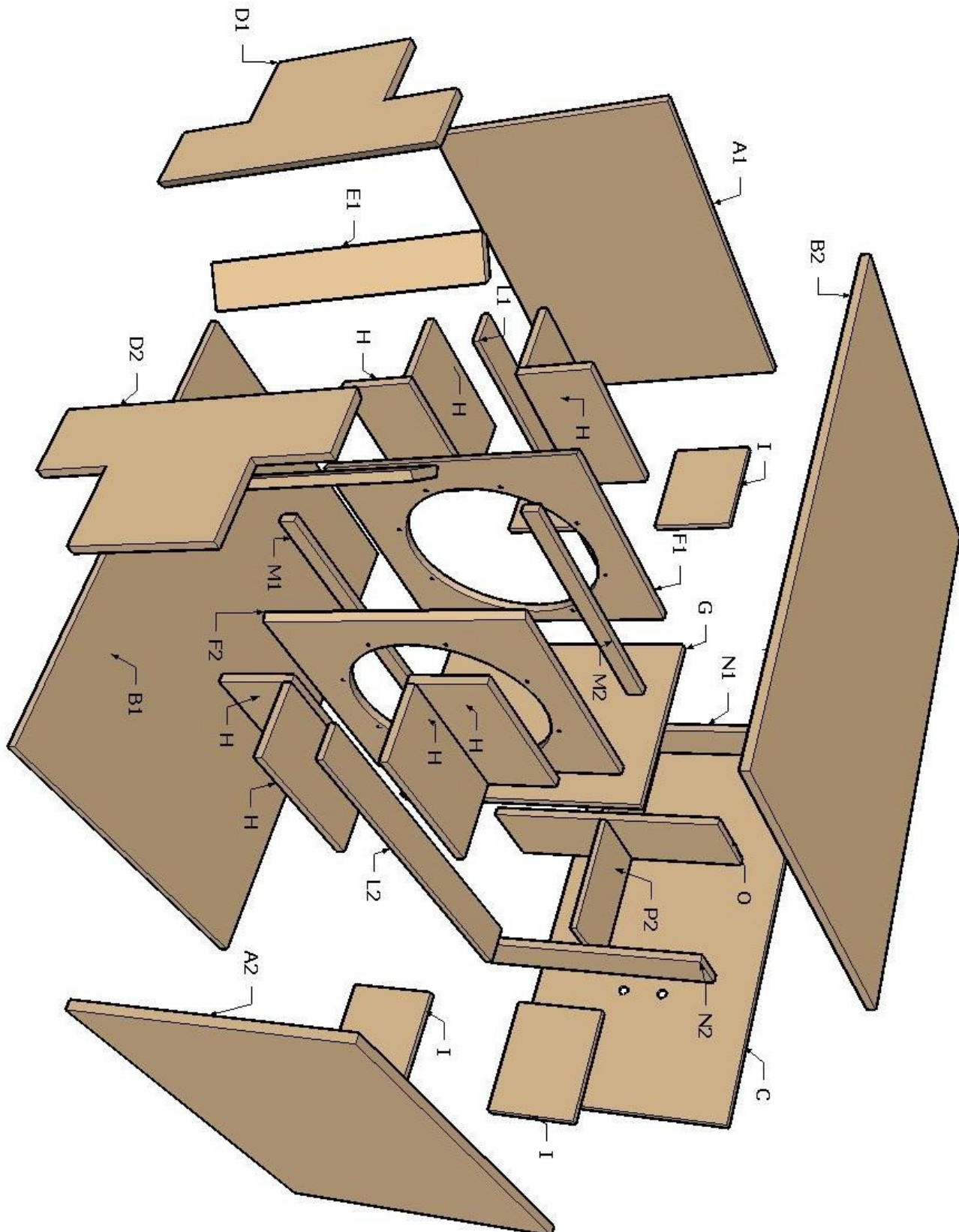


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Internal view and damping



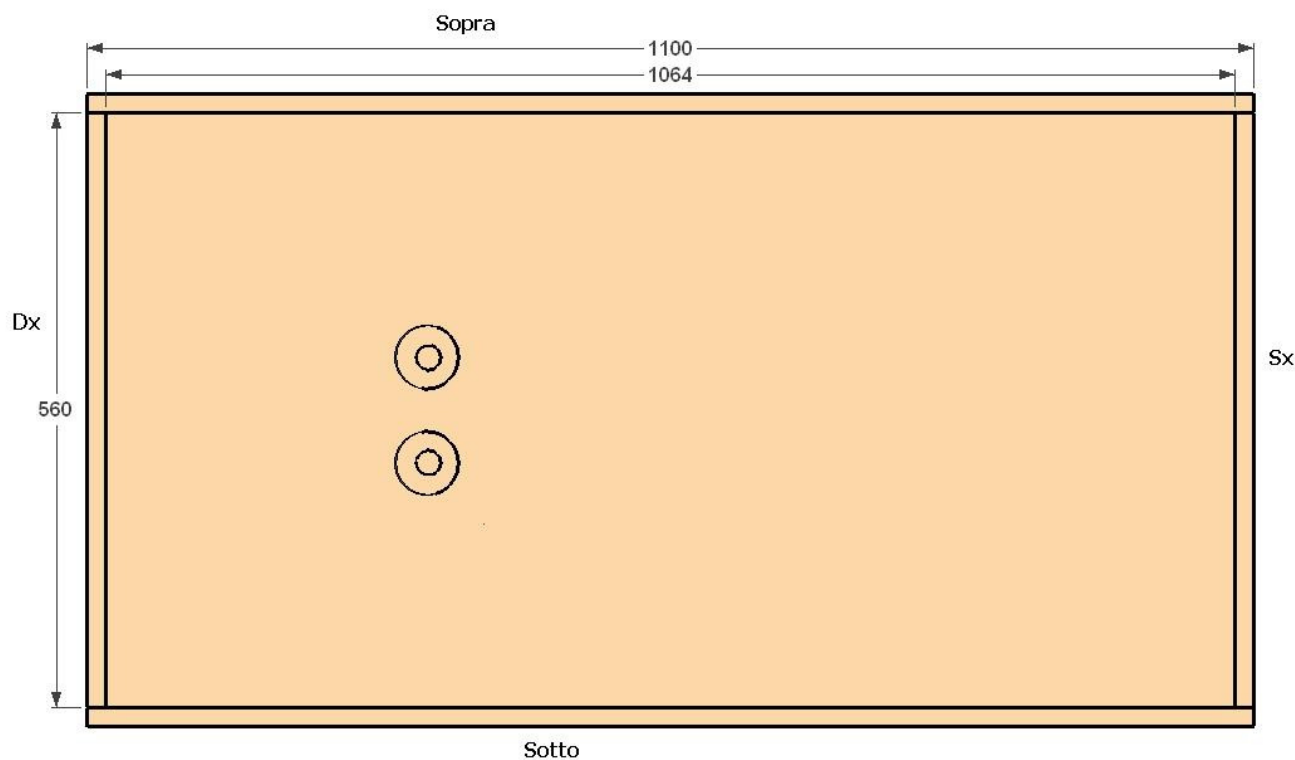
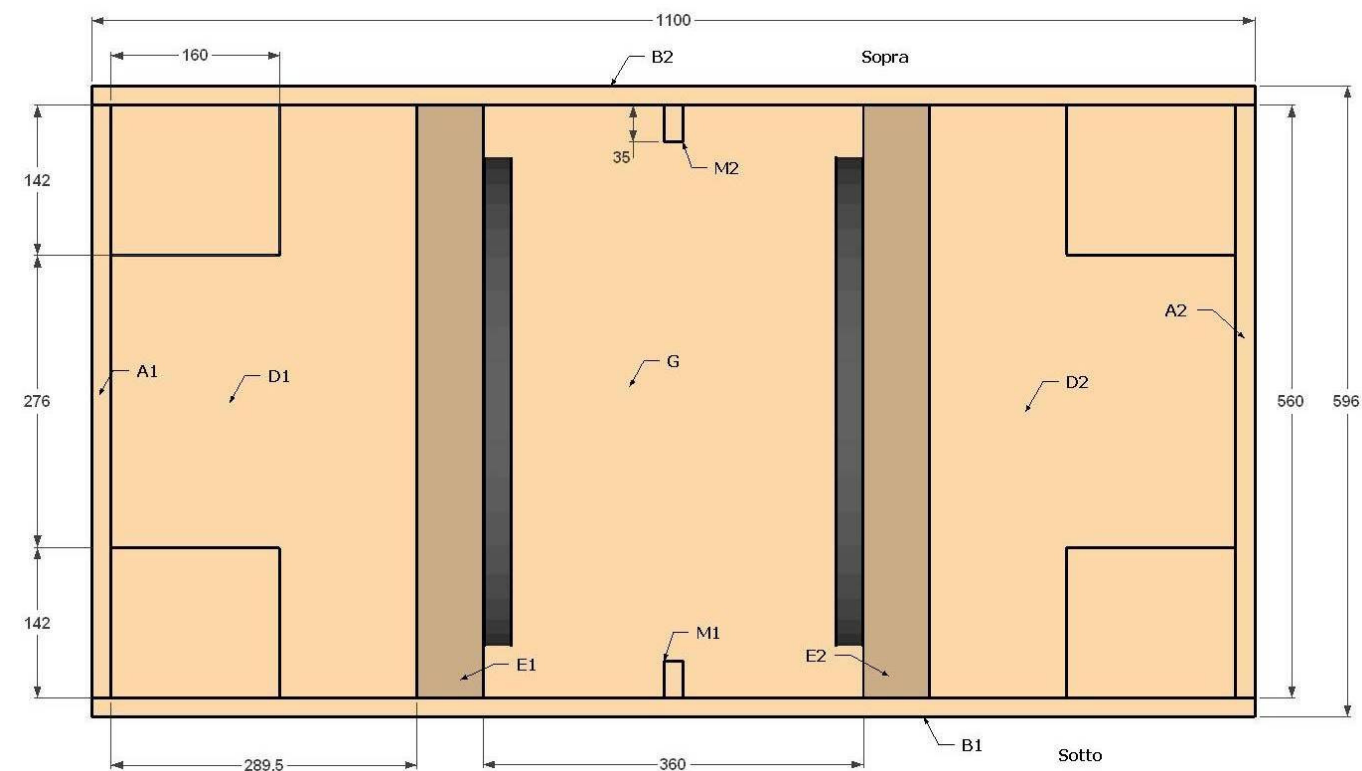
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Exploded view

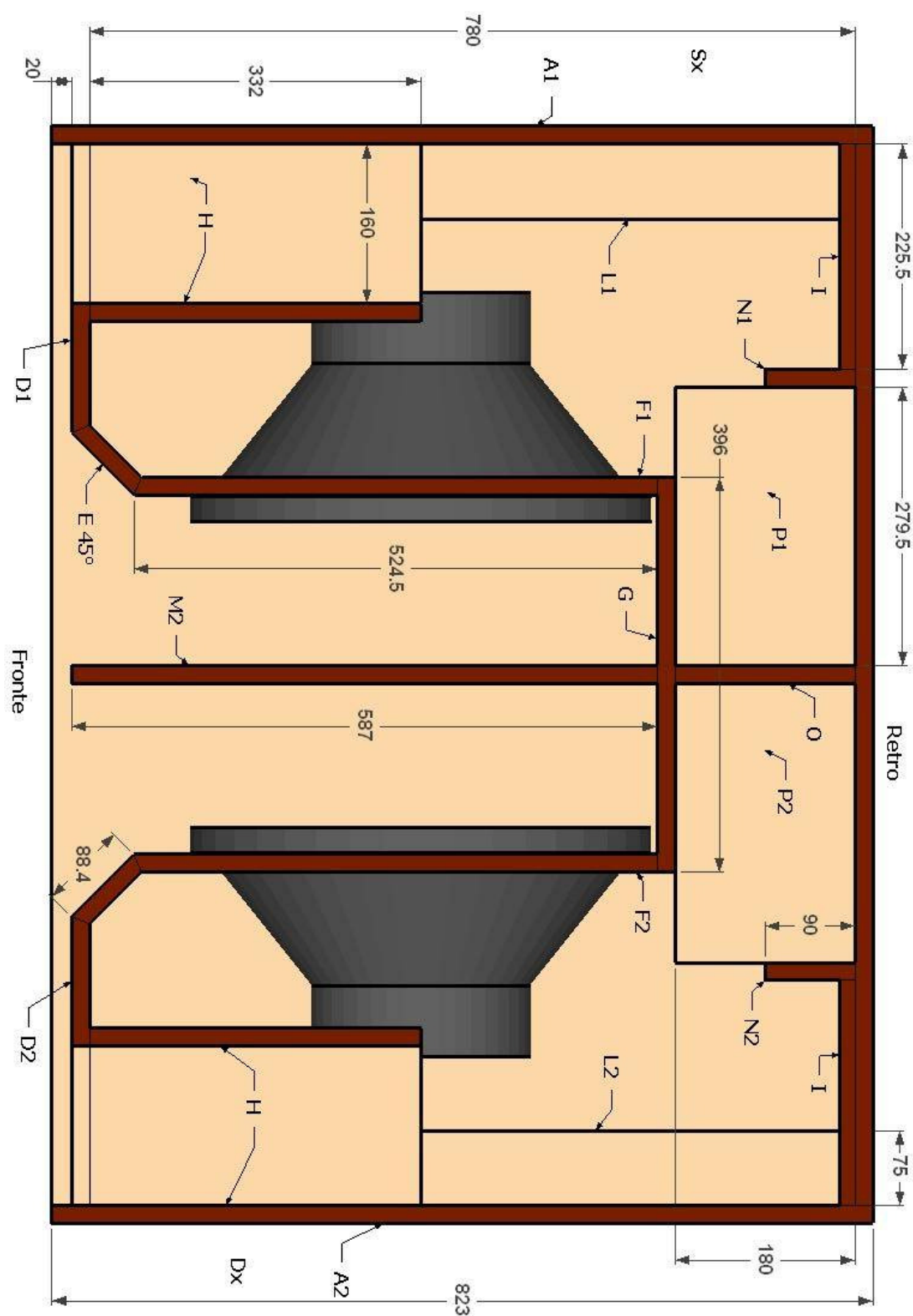
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Front-Rear view



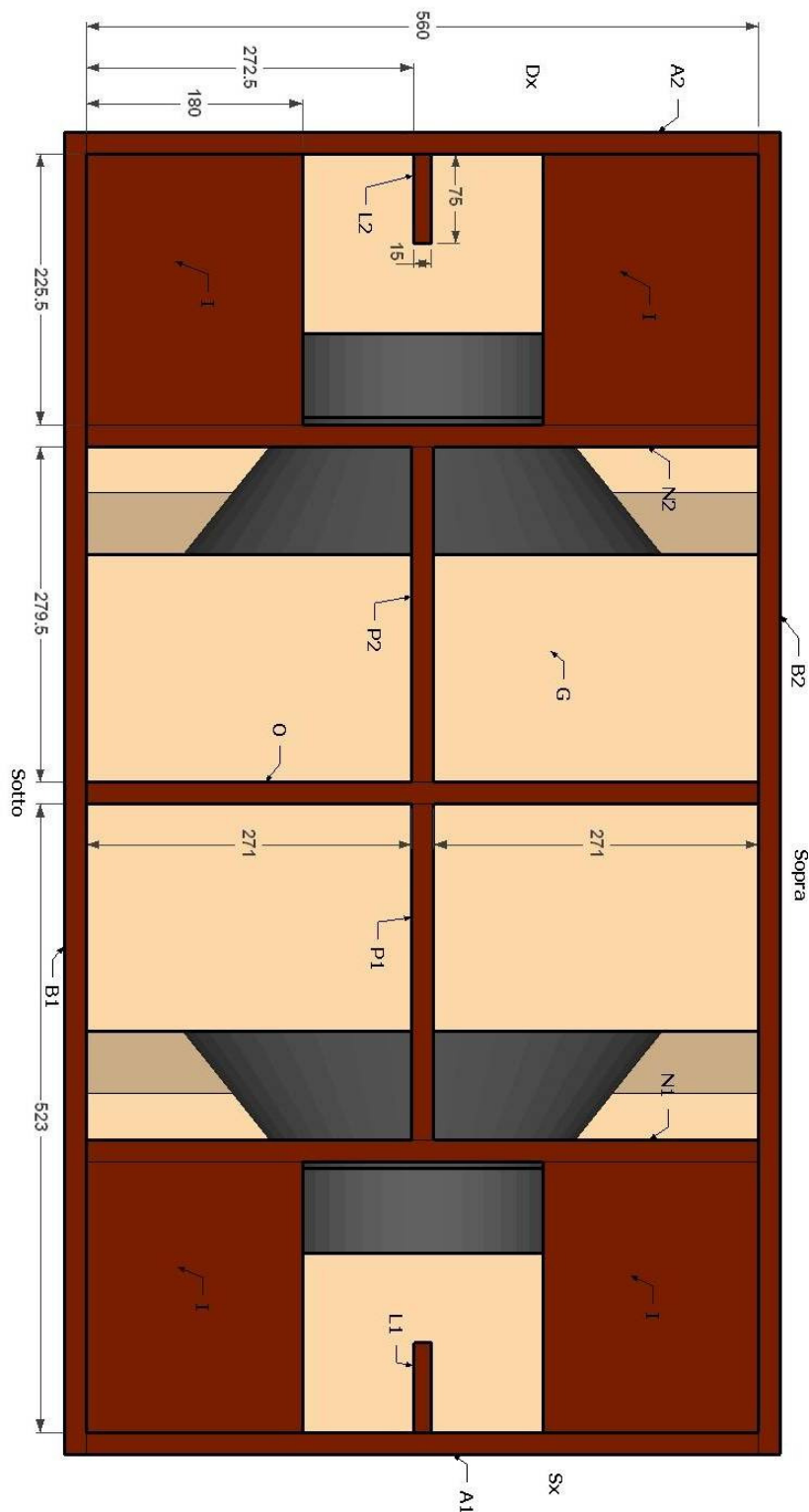
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Top Section



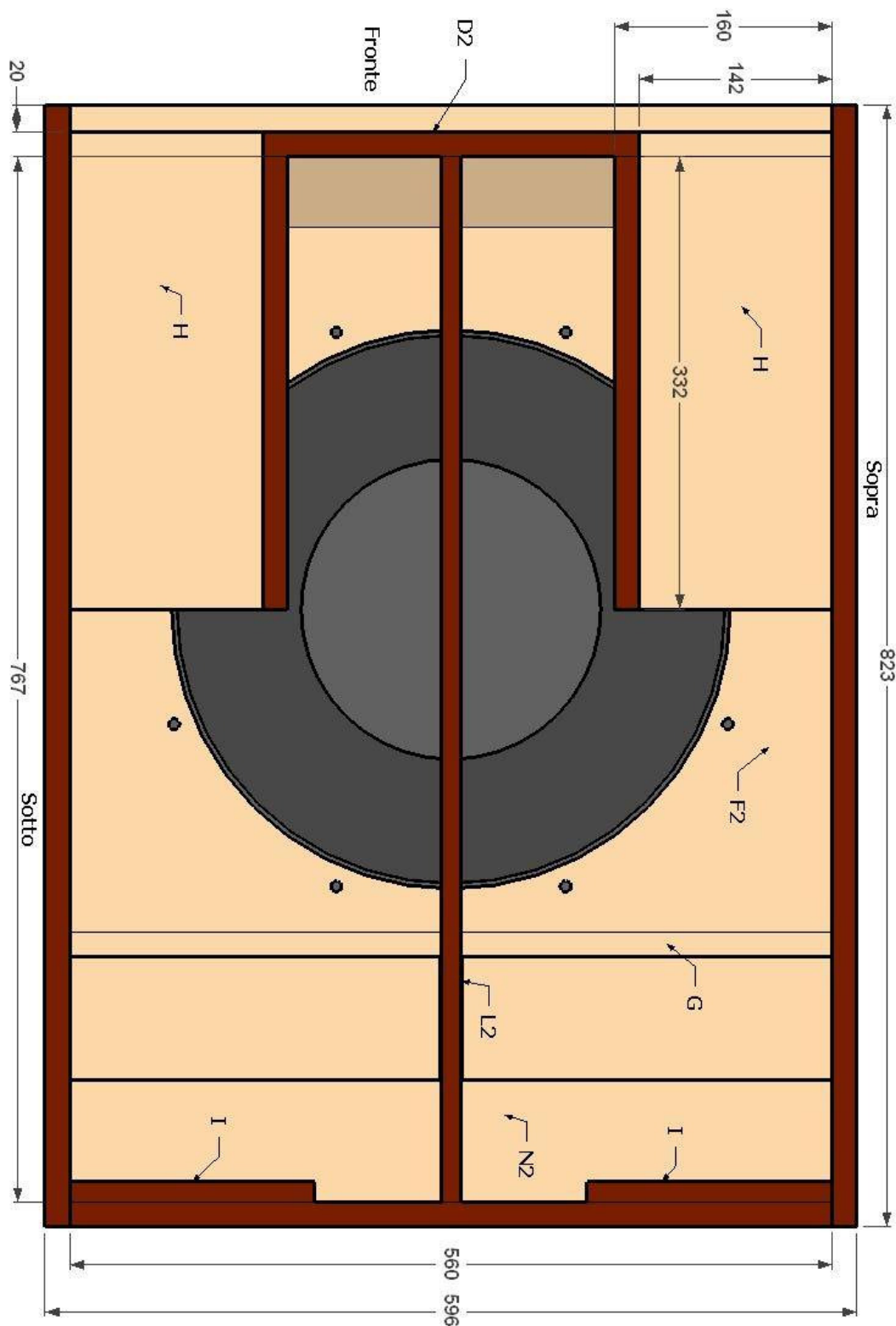
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Rear Section



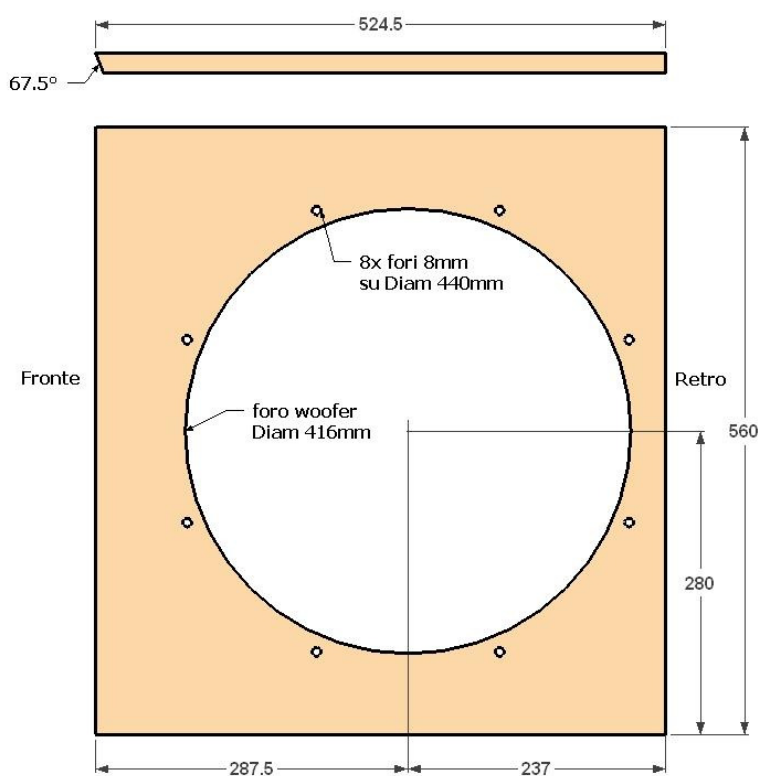
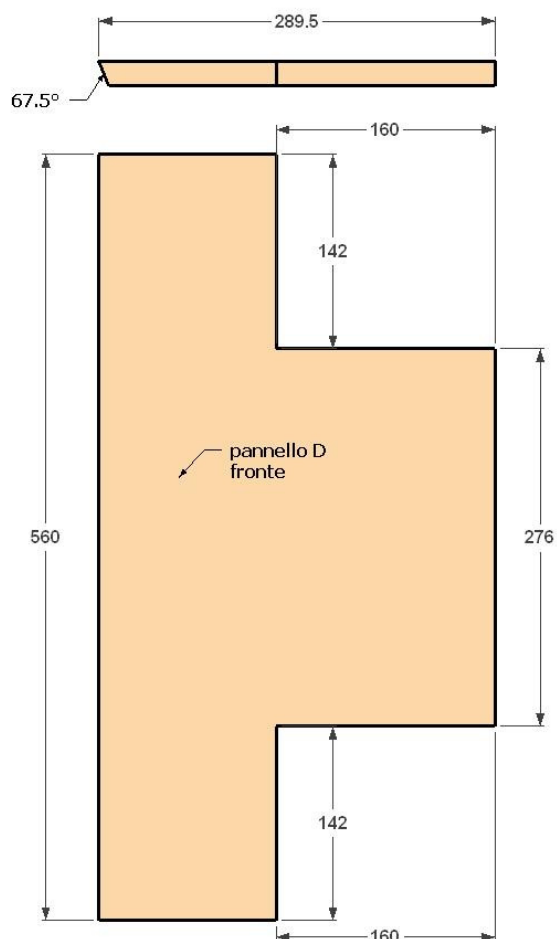
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Side Section



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Details: part D and F



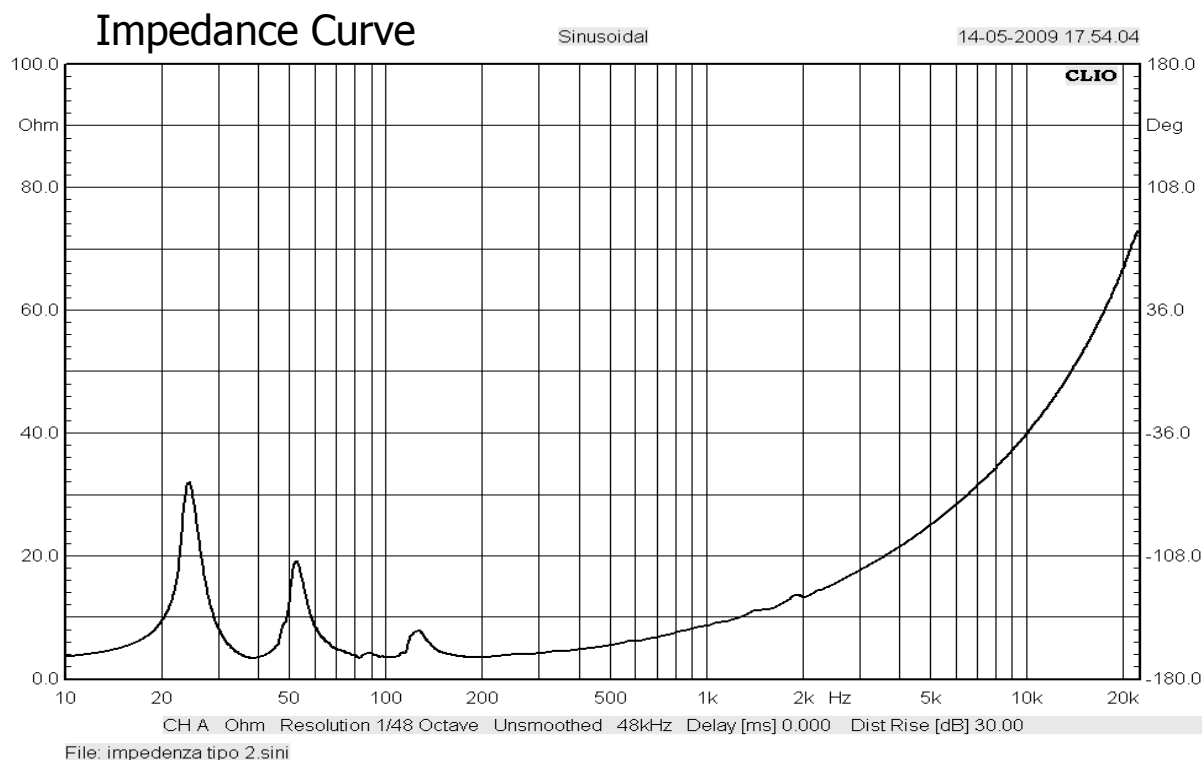
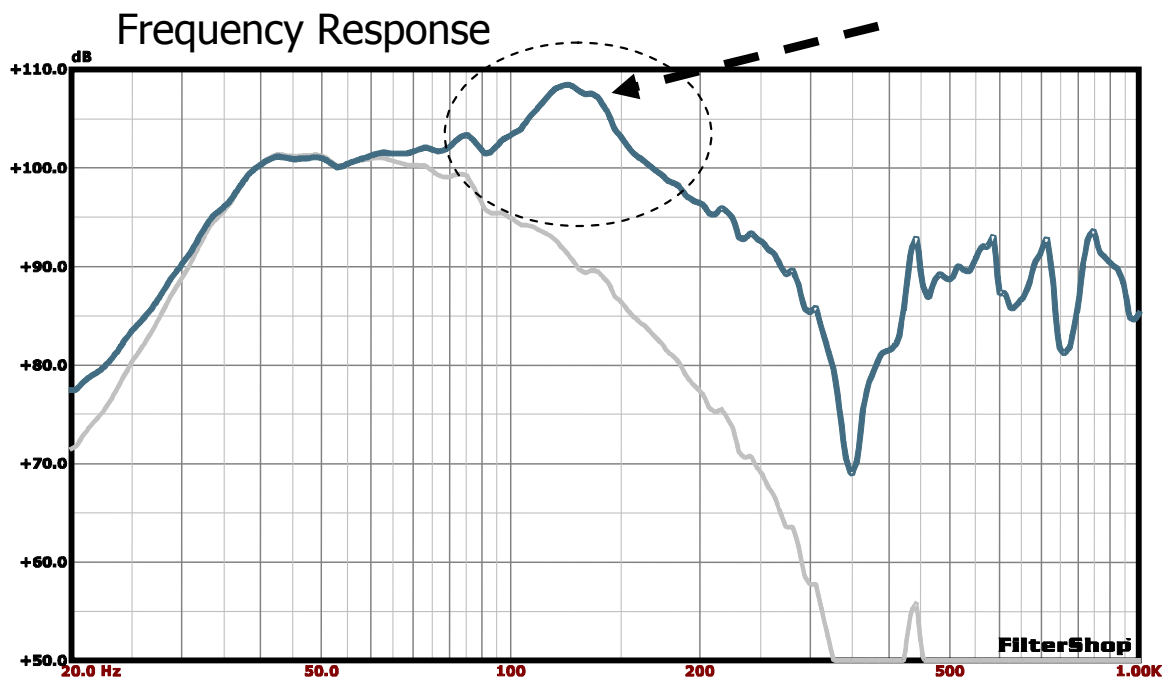


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Measurements

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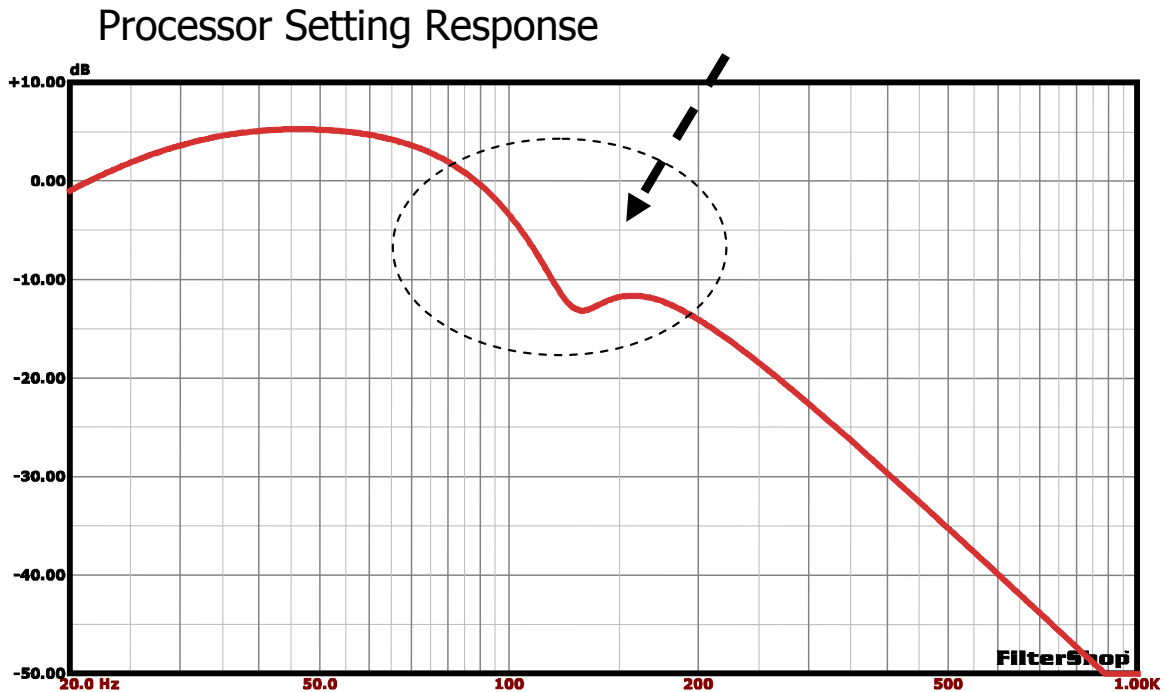
Unfiltered Frequency Response, 2.83V/1m and relative Input Impedance Curve with 18NLW9600 Loudspeaker





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Processing Guidelines and Processor Response



Necessary Processor Settings with 18NLW9600 Loudspeaker

High pass: Butterworth **2nd** order, 12dB/Oct @ 30 Hz

Parametric EQ **Eq1:** F= 116 Hz - Gain= -5 dB - Q= 1.5

Eq2: F= 127 Hz - Gain= -8 dB - Q= 4.5

Low pass: Butterworth **3th** order, 18dB/Oct @ 100 Hz

Polarity: Positive (+)

Limiter: @ +12dBu, 100ms Atk. Time, X4 Release Time

Output Gain: + 7dB

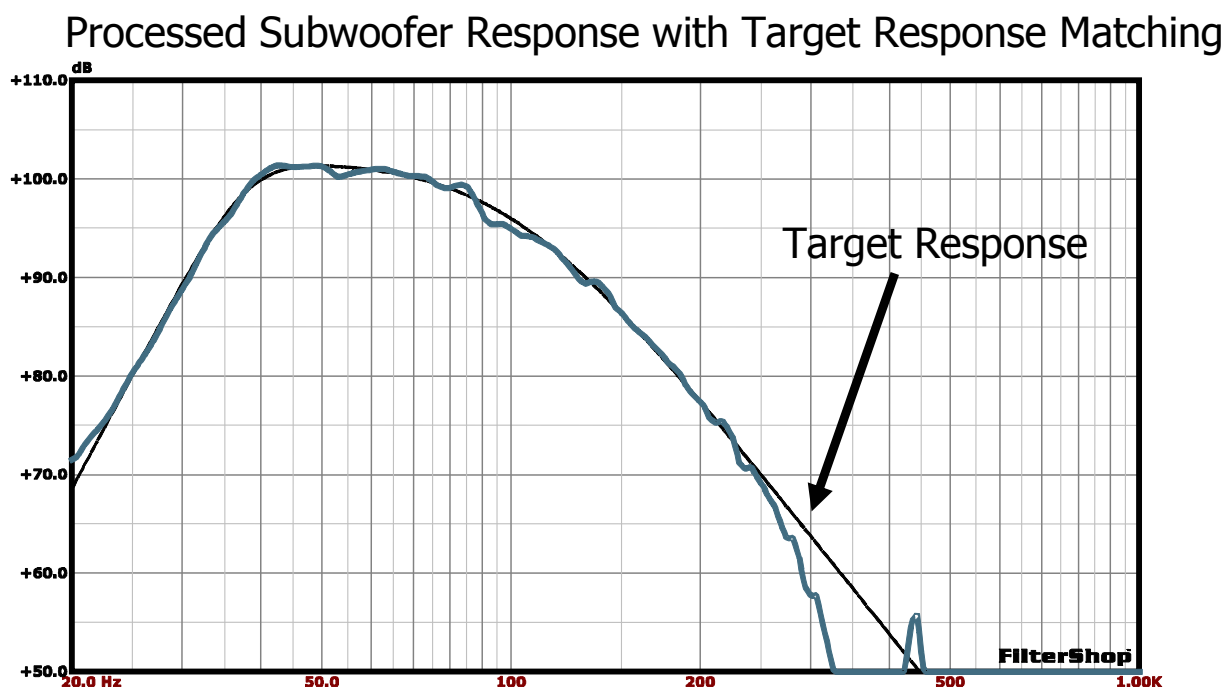
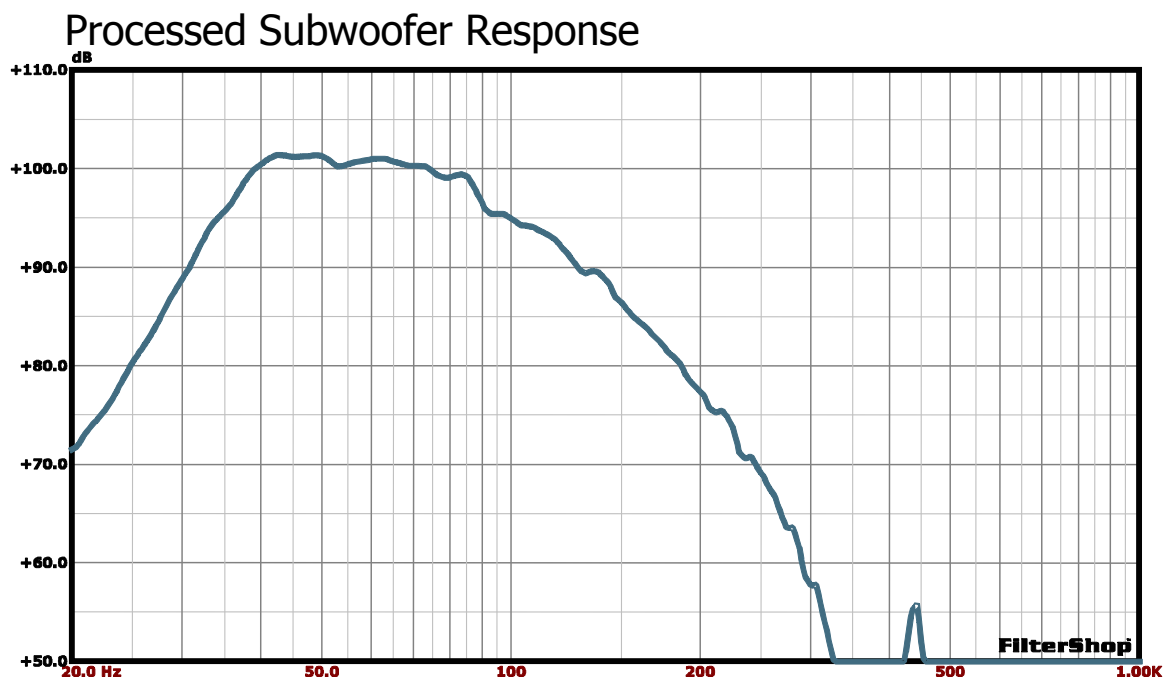
Processing Parameters Referred to **XTA DP224/DP226/DP448** Processors

Required Amplifier for proper driving, approx.: 2000W @ 8 Ohm, 4000W @ 4 Ohm with Gain 32dB

Gain and Limiter Values need to be properly adjusted if different gain amplifier is being used

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Processed Frequency Response



The Reference Target Response is an Acoustical Band-Pass Response of a total 10th order. High Pass=Butterworth 6th Order @ **38Hz**, Low-Pass=Linkwitz-Riley 4th Order @ **100Hz**