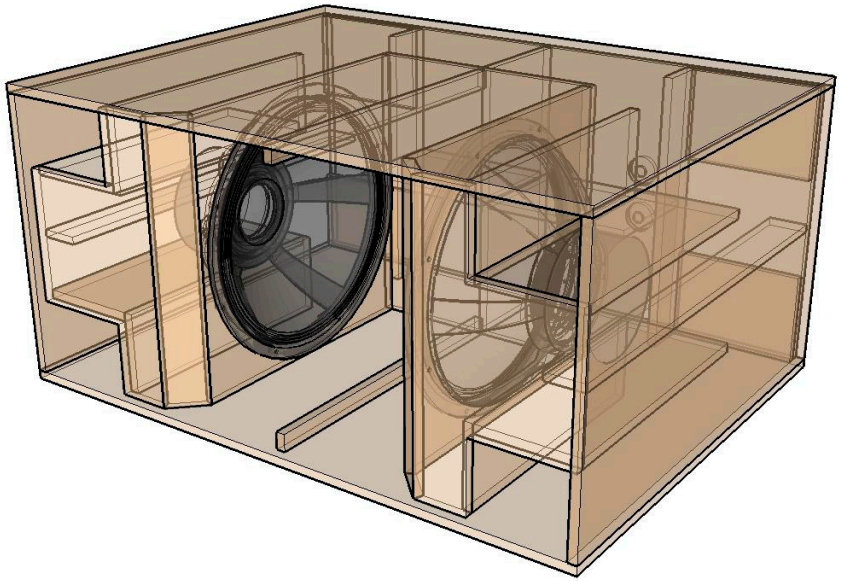
EIGHTEEN SOUND

PROFESSIONAL LOUDSPEAKERS

APPLICATION NOTE



MANIFOLDED, DOUBLE 21″ BAND-PASS SUBWOOFER KIT

KEY FEATURES

> High performance 2 x 21″ subwoofer system

> Multiple driver choice is possible:

1) 21NLW9000, for high power handling and lightweight box, neodimium magnet equipped.
2) 21LW1400 for cost effective solution equipped with ceramic magnet
3) Alternatively, 21NLW9600 could be a special option for highest efficiency, increased motor-strength and maximum impact.

1) 21NLW9000

KEY FEATURES

Neodymium magnet
5.3″ interleaved sanwitch voice coil (ISV)
Triple silicon spider (TSS)
1800W AES power handling

GENERAL SPECIFICATIONS

NOMINAL DIAMETER	533 MM (21 in)
RATED IMPEDANCE	8 Ohm
AES POWER	1800W
PROGRAM POWER	3600W
PEAK POWER	10000W
SENSITIVITY	96 dB
FREQUENCY RANGE	24 ÷ 1500 Hz
POWER COMPRESSION @-10dB	0.7 dB
POWER COMPRESSION @-3dB	1.3 dB
POWER COMPRESSION @0dB	2.2 dB
MAX RECOMM. FREQUENCY	100 Hz
RECOMM. ENCLOSURE VOLUME	120 ÷ 500 lt (4.24÷17.7cuft)
MINIMUM IMPEDANCE	8.2 Ohm 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	Copper
SUSPENSION	Triple roll, Polycotton
CONE	Straight Ribbed, Treated paper

THIELE SMALL PARAMETERS

Fs	29 Hz
Re	6 Ohm
Sd	0.1662 sq mt. (257.6q.in.)
Qms	9.32
Qes	0.36
Qts	0.34
Vas	304 lt (10.4 cuft)
Mms	390 lt (0.86 lb)
BL	34.5 Tm
Linear mathematical Xmax	± 14 mm (0.55 in)
Le (1kHz)	2.8 mH
Ref. Efficiency 1W@1m (half space)	95.0 dB

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KEY FEATURES

> High performance 2 x 21" subwoofer system

> Multiple driver choice is possible:

1) 21NLW9000, for high power handling and lightweight box, neodimium magnet equipped.
2) 21LW1400 for cost effective solution equipped with ceramic magnet
3) Alternatively, 21NLW9600 could be a special option for highest efficiency, increased motor-strength and maximum impact.

2) 21LW1400

KEY FEATURES

4" interleaved sandwitch voice coil (ISV)
Double silicon spider (DSS)
Double demodulating rings (DDR)
1500W AES power handling

COST EFFECTIVE SOLUTION

GENERAL SPECIFICATIONS

NOMINAL DIAMETER	533 MM (21 in)
RATED IMPEDANCE	8 Ohm
AES POWER	1400W
PROGRAM POWER	1600W
PEAK POWER	7000W
SENSITIVITY	99 dB
FREQUENCY RANGE	24 ÷ 2000 Hz
POWER COMPRESSION @-10dB	0.6 dB
POWER COMPRESSION @-3dB	1.5 dB
POWER COMPRESSION @0dB	2.2 dB
MAX RECOMM. FREQUENCY	250 Hz
RECOMM. ENCLOSURE VOLUME	120 ÷ 500 lt (4.24÷17.7cuft)
MINIMUM IMPEDANCE	6.4 Ohm at 25°C
MAX PEAK TO PEAK EXCURSION	52 mm (4 in)
VOICE COIL DIAMETER	135 mm (5.32 in)
VOICE COIL WINDING MATERIAL	Copper
SUSPENSION	Triple roll, Polycotton
CONE	Straight Ribbed, Paper

THIELE SMALL PARAMETERS

Fs	28 Hz
Re	5 Ohm
Sd	0.1662 sq mt. (257.6q.in.)
Qms	9.32
Qes	0.242
Qts	0.235
Vas	385 lt (13.6 cuft)
Mms	296 lt (0.65 lb)
BL	33.5 Tm
Linear mathematical Xmax	± 9.5 mm (0.37 in)
Le (1kHz)	2.85 mH
Ref. Efficiency 1W@1m (half space)	98.0 dB

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KEY FEATURES

> High performance 2 x 21" subwoofer system

> Multiple driver choice is possible:

1) 21NLW9000, for high power handling and lightweight box, neodimium magnet equipped.
2) 21LW1400 for cost effective solution equipped with ceramic magnet
3) Alternatively, 21NLW9600 could be a special option for highest efficiency, increased motor-strength and maximum impact.

3) 21NLW9600

KEY FEATURES

Similar mechanic characteristics like 21NLW9000 model but with augmented strength magnet for an outstanding 43.5! Bl factor

MAXIMUM IMPACT

GENERAL SPECIFICATIONS

NOMINAL DIAMETER	533 MM (21 in)
RATED IMPEDANCE	8 Ohm
AES POWER	1800W
PROGRAM POWER	3600W
PEAK POWER	10000W
SENSITIVITY	97 dB
FREQUENCY RANGE	24 ÷ 2000 Hz
POWER COMPRESSION @-10dB	0.7 dB
POWER COMPRESSION @-3dB	1.3 dB
POWER COMPRESSION @0dB	2.2 dB
MAX RECOMM. FREQUENCY	100 Hz
RECOMM. ENCLOSURE VOLUME	120 ÷ 500 lt (4.24÷17.7cuft)
MINIMUM IMPEDANCE	8.2 Ohm 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	Copper
SUSPENSION	Triple roll, Polycotton
CONE	Straight Ribbed, Treated paper

THIELE SMALL PARAMETERS

Fs	29 Hz
Re	6 Ohm
Sd	0.1662 sq mt. (257.6q.in.)
Qms	9.32
Qes	0.23
Qts	0.22
Vas	304 lt (10.4 cuft)
Mms	390 lt (0.86 lb)
BL	43.5 Tm
Linear mathematical Xmax	± 14 mm (0.55 in)
Le (1kHz)	3 mH
Ref. Efficiency 1W@1m (half space)	97.0 dB

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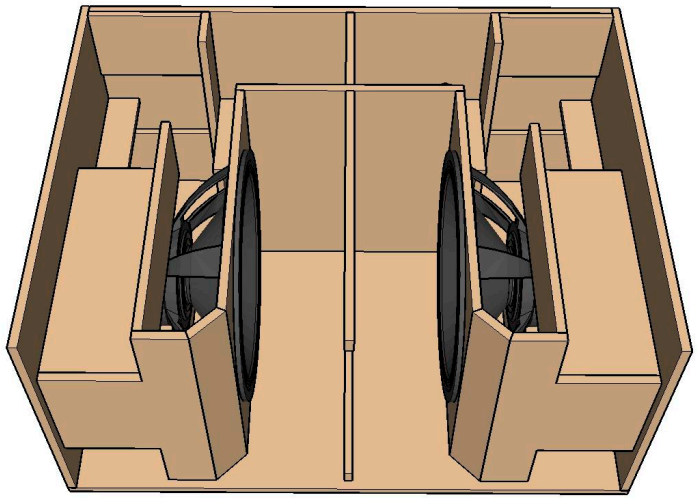
KEY FEATURES

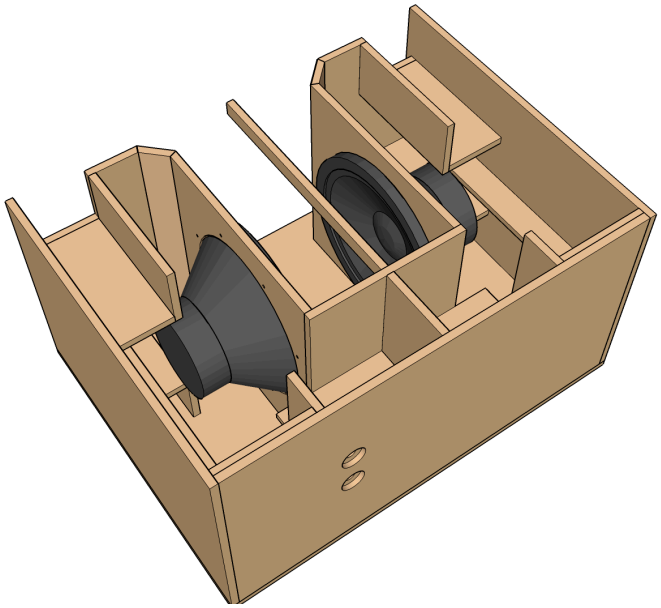
> The enclosure should be made of baltic birch plywood (18mm thickness)

> Bolts are M6x35mm

> M6 T-Nuts are recommended

> Handling, rigging and connectors are user's choice





INTERNAL VIEW

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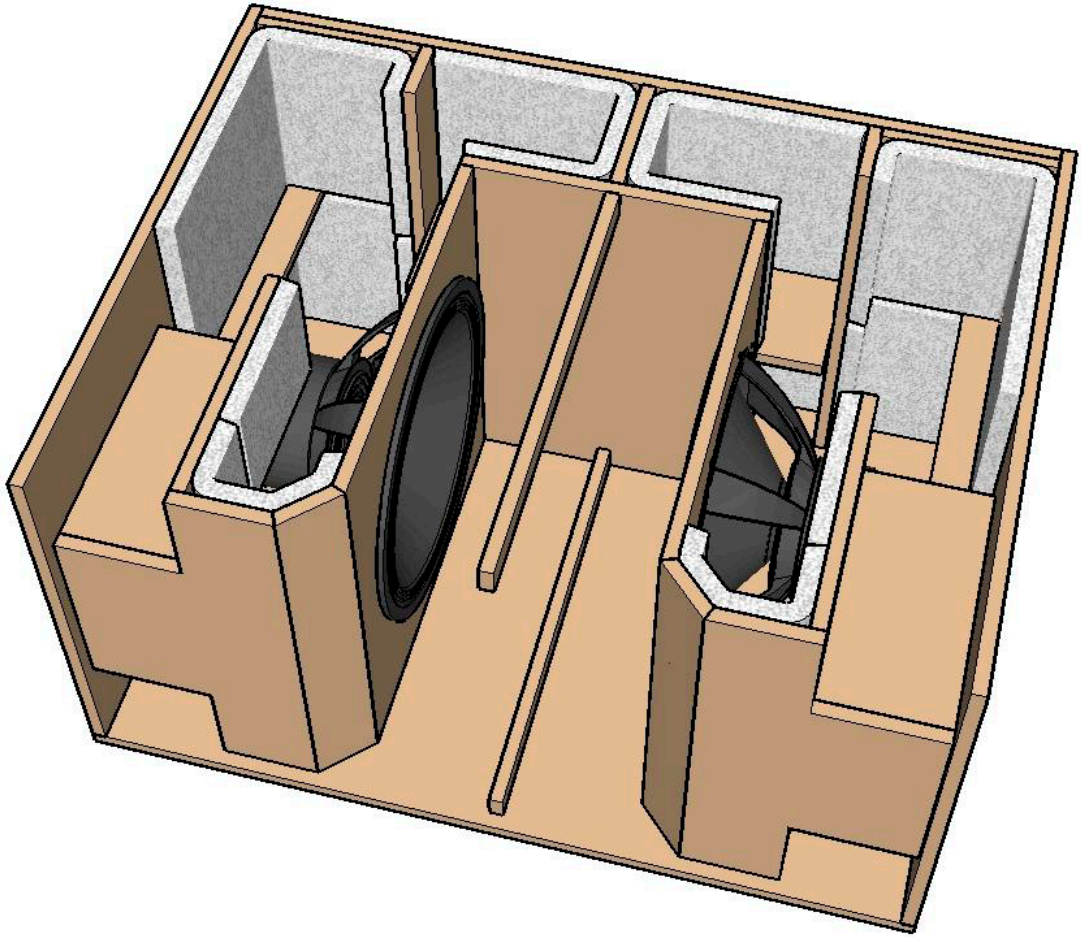
KEY FEATURES

> 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 AND DAMPING

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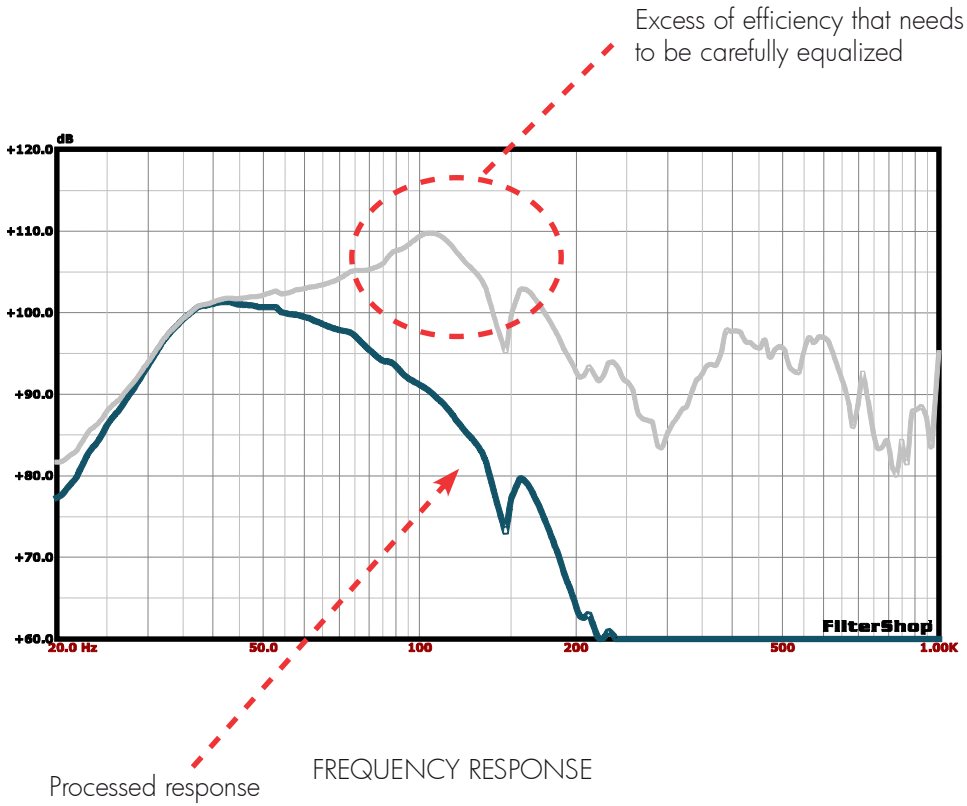
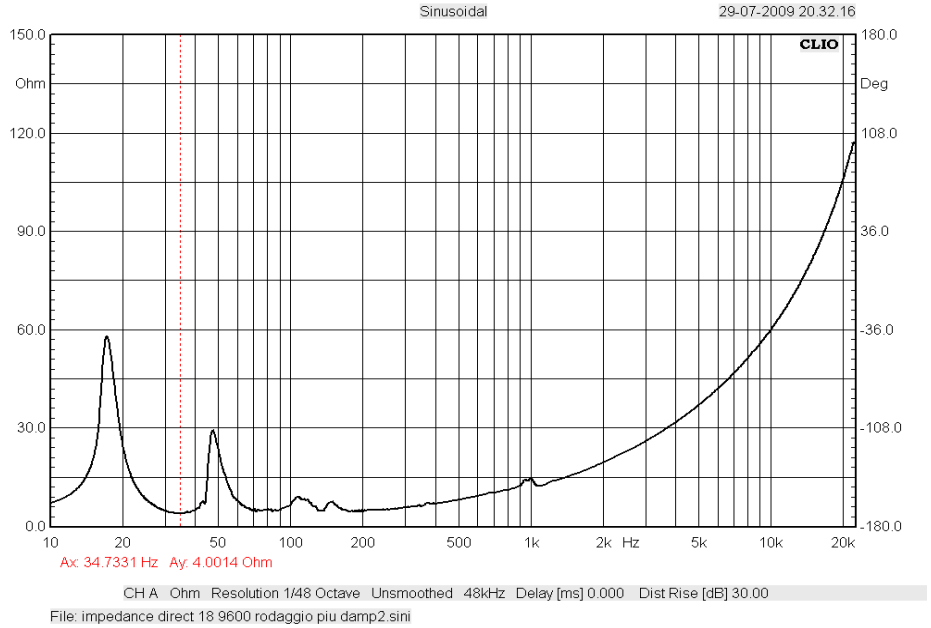
MEASUREMENTS: UNFILTERED FREQUENCY RESPONSE, 2.83V/1M AND RELATIVE INPUT IMPEDANCE CURVE WITH 21NLW9000



FREQUENCY RESPONSE



IMPEDANCE CURVE

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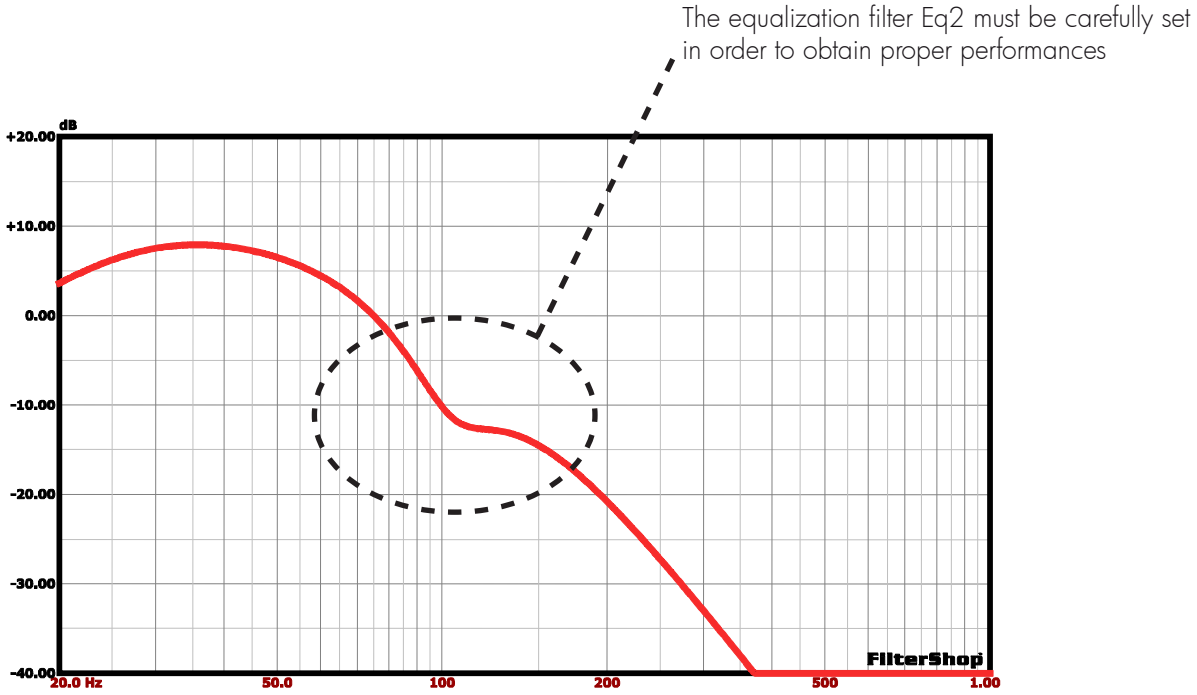
PROCESSING GUIDELINES AND PROCESSOR RESPONSE WITH 21NLW9000



PROCESSOR SETTING RESPONSE

NECESSARY PROCESSOR SETTINGS WITH 21NLW9000 LOUDSPEAKER

> High pass: Butterworth 2nd order, 12dB/Oct @ 25 Hz

> Parametric EQ Eq1: F= 33 Hz - Gain= 2dB - Q= 0.8
Eq2: F= 105 Hz - Gain= -12 dB - Q= 3

> Low pass: Linkwitz-Riley 4th order, 24dB/Oct @ 95 Hz
> Polarity: Positive (+)
> Limiter: @ +13dBu, 100ms Atk. Time, X4 Release Time
> Output Gain: + 8dB

Processing Parameters Referred to XTA DP224/DP226/DP448 Processors

Required Amplifier for proper driving, approx.: 2500W @ 8 Ohm, 5000W @ 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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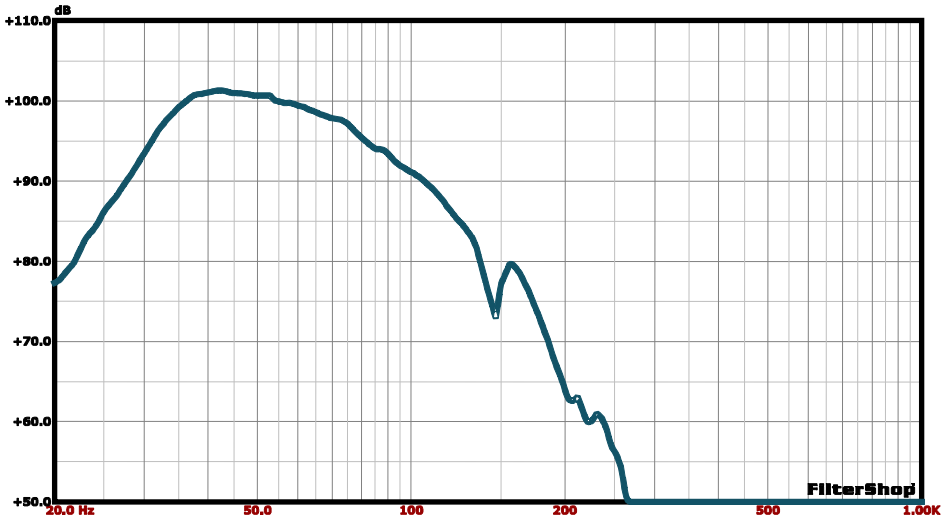
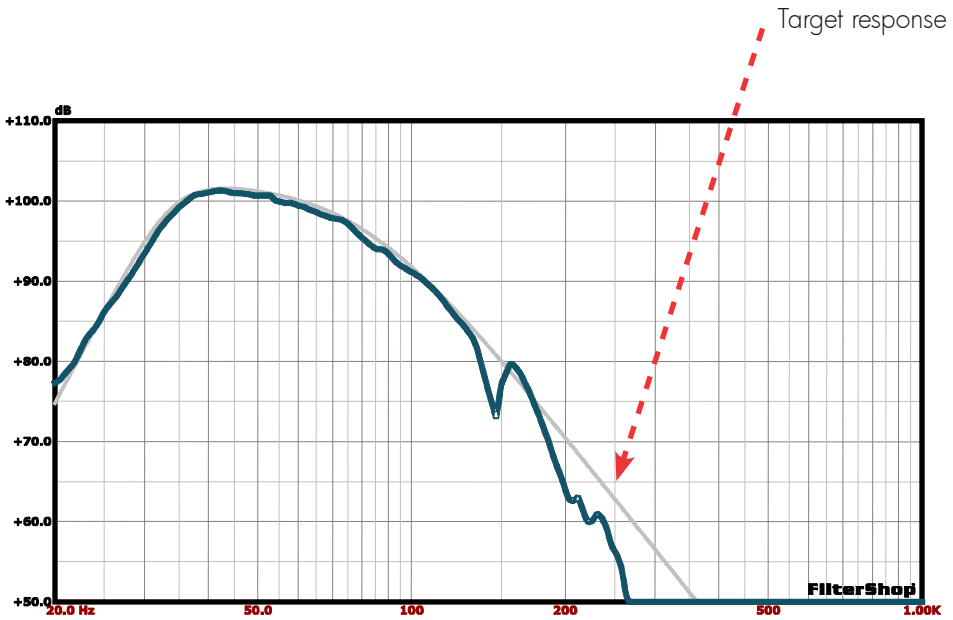
PROCESSED FREQUENCY RESPONSE WITH 21NLW9000



PROCESSED SUBWOOFER RESPONSE



PROCESSED SUBWOOFER RESPONSE WITH TARGET RESPONSE MATCHING

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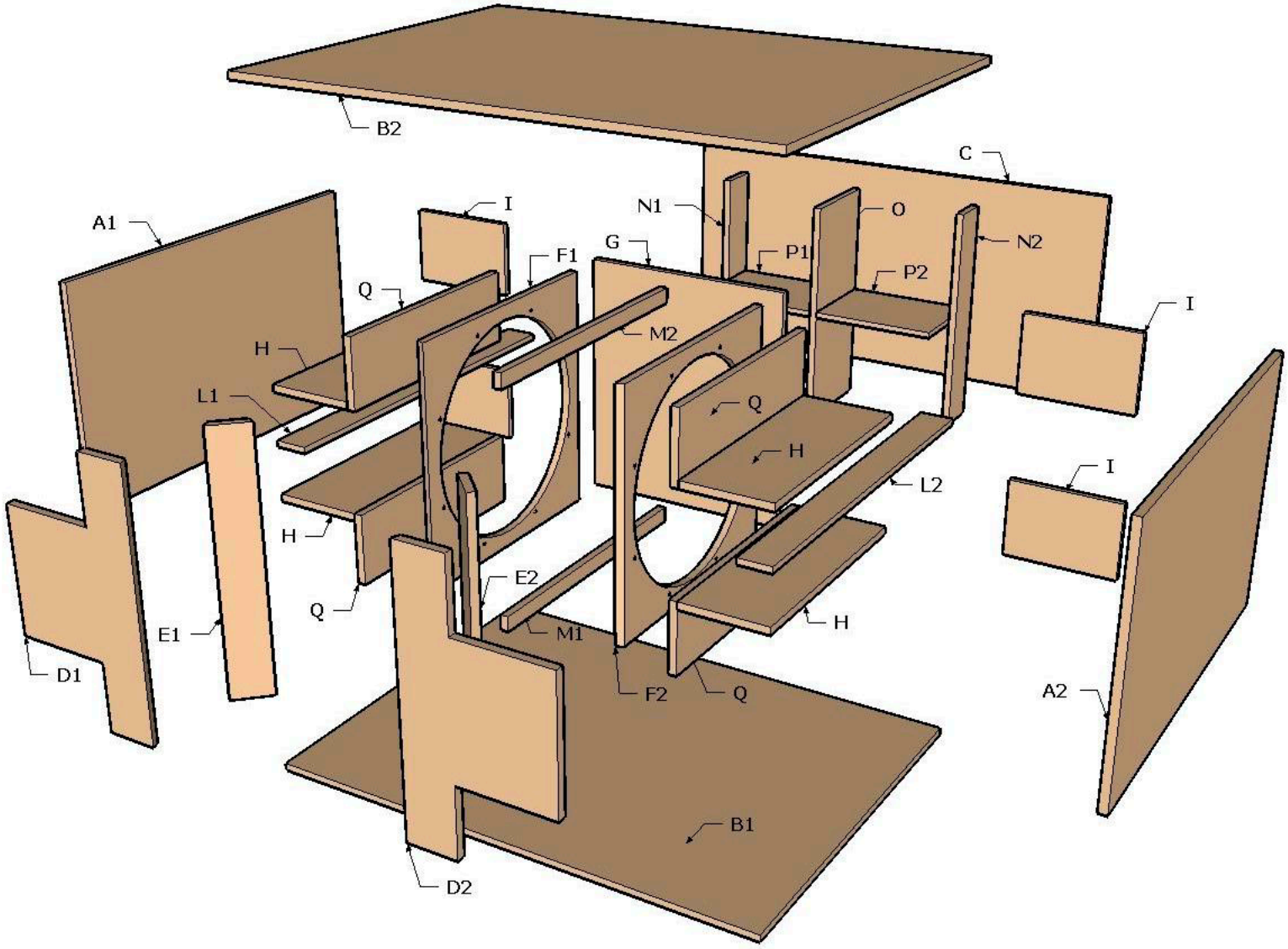
EXPLODED VIEW



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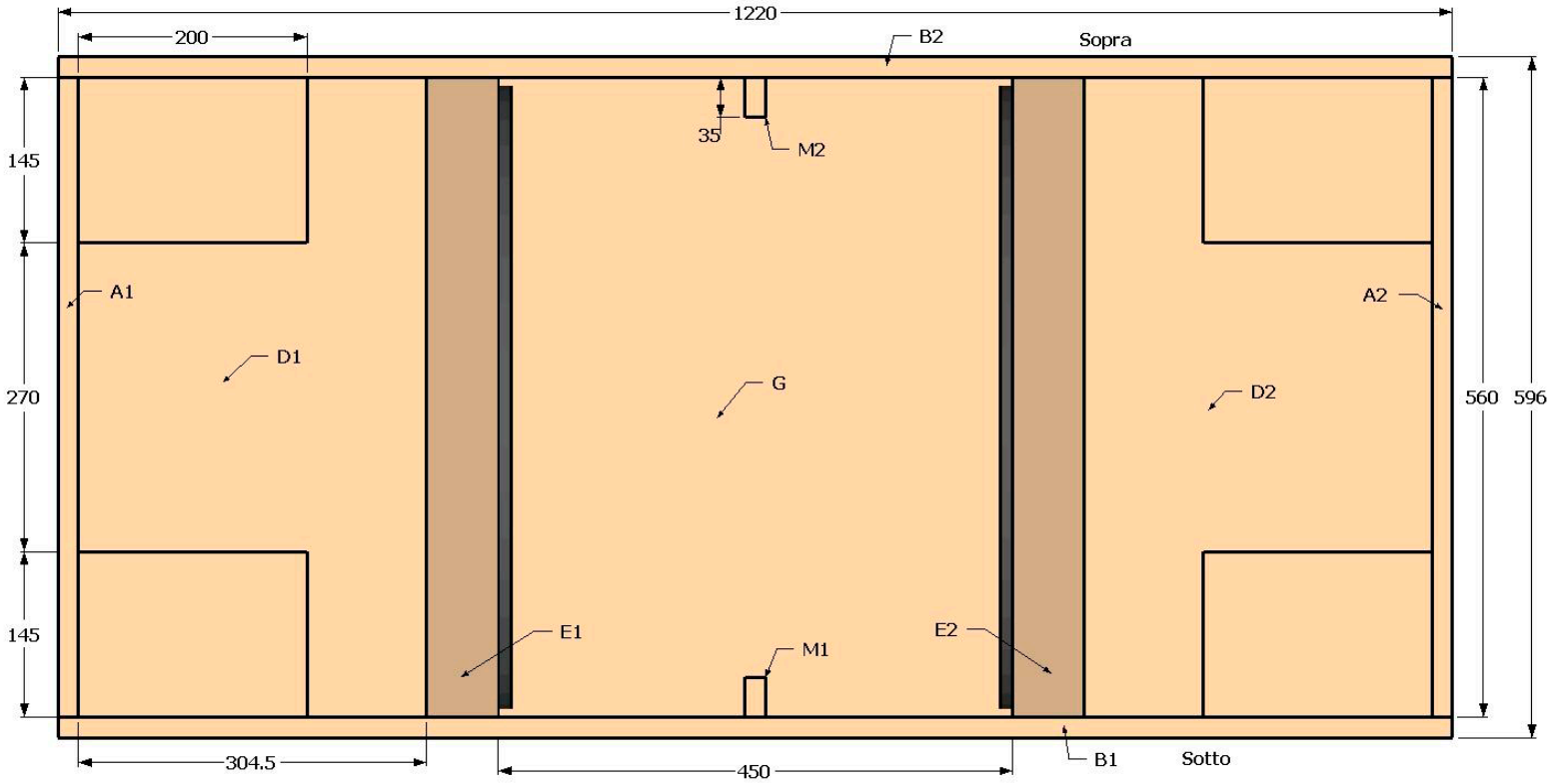
FRONT VIEW



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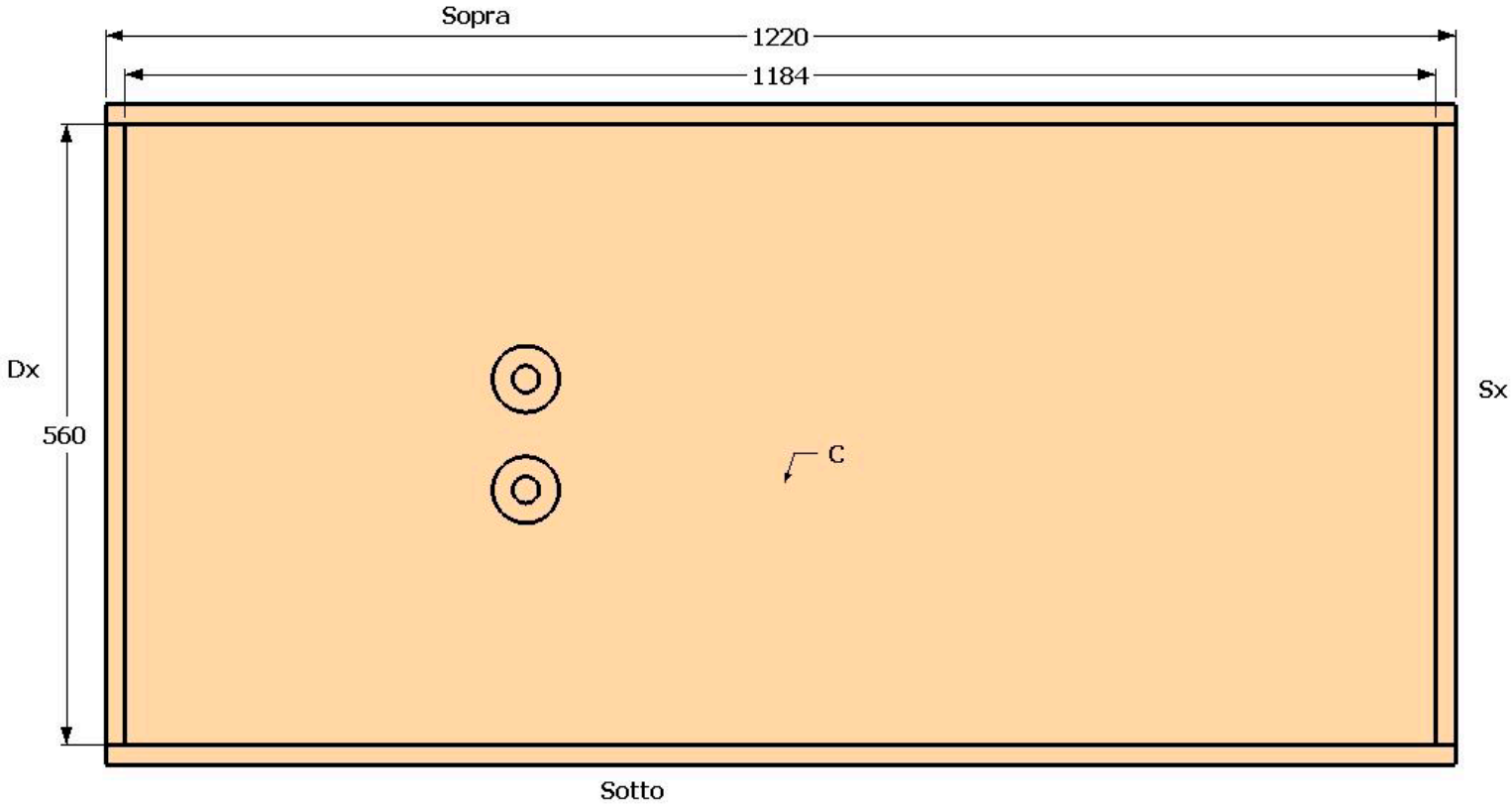
REAR VIEW



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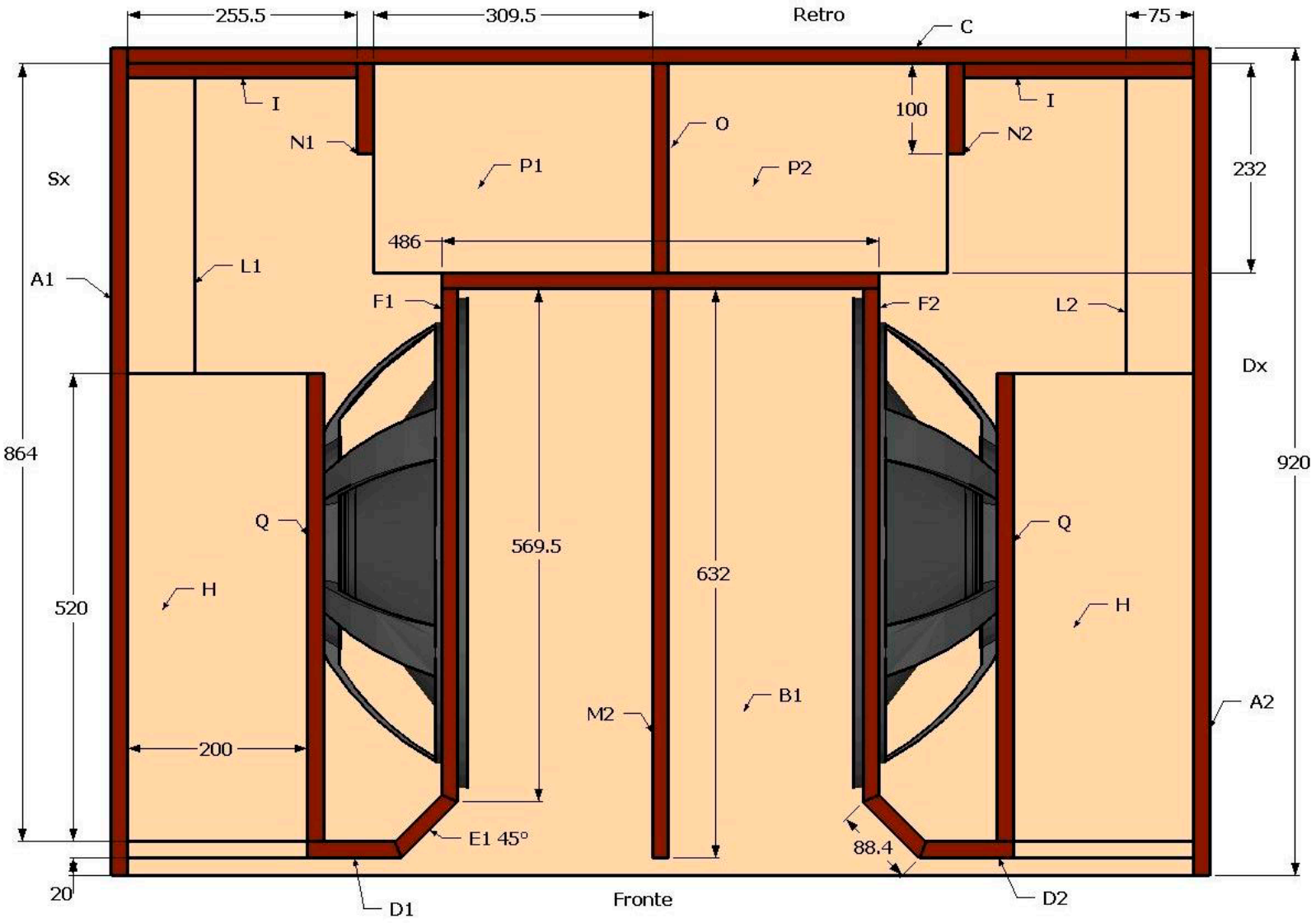
TOP SECTION



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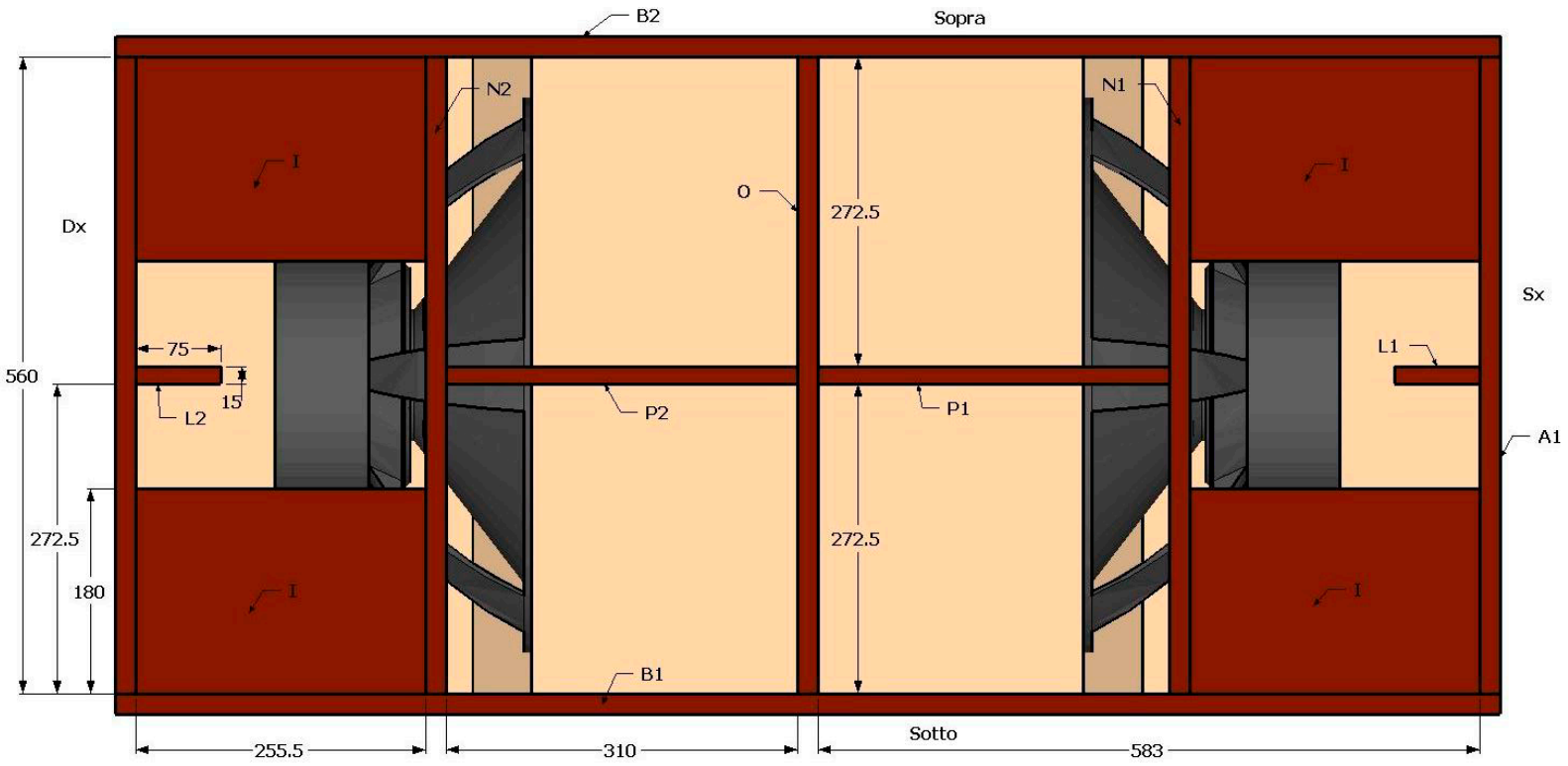
REAR SECTION



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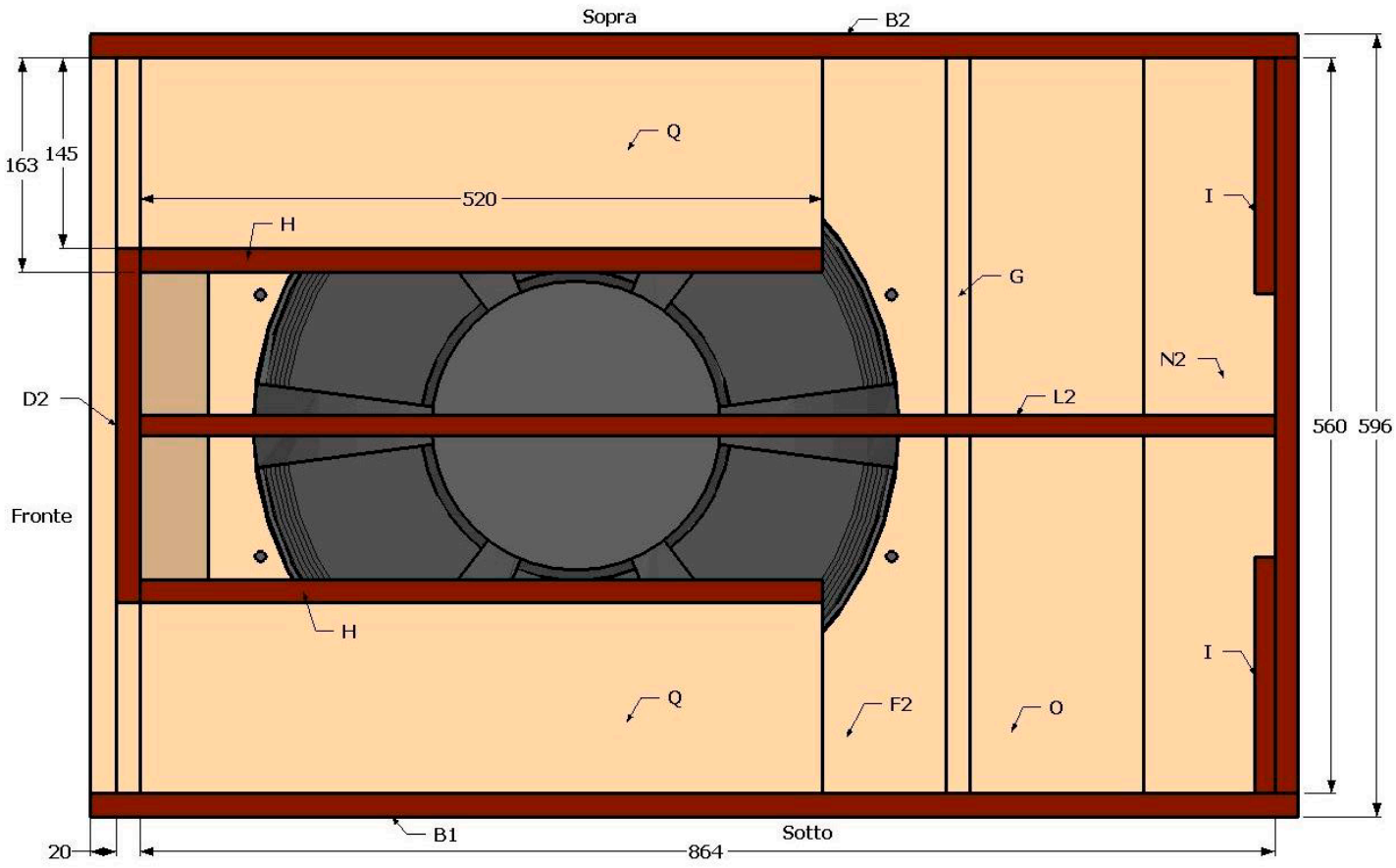
SIDE SECTION



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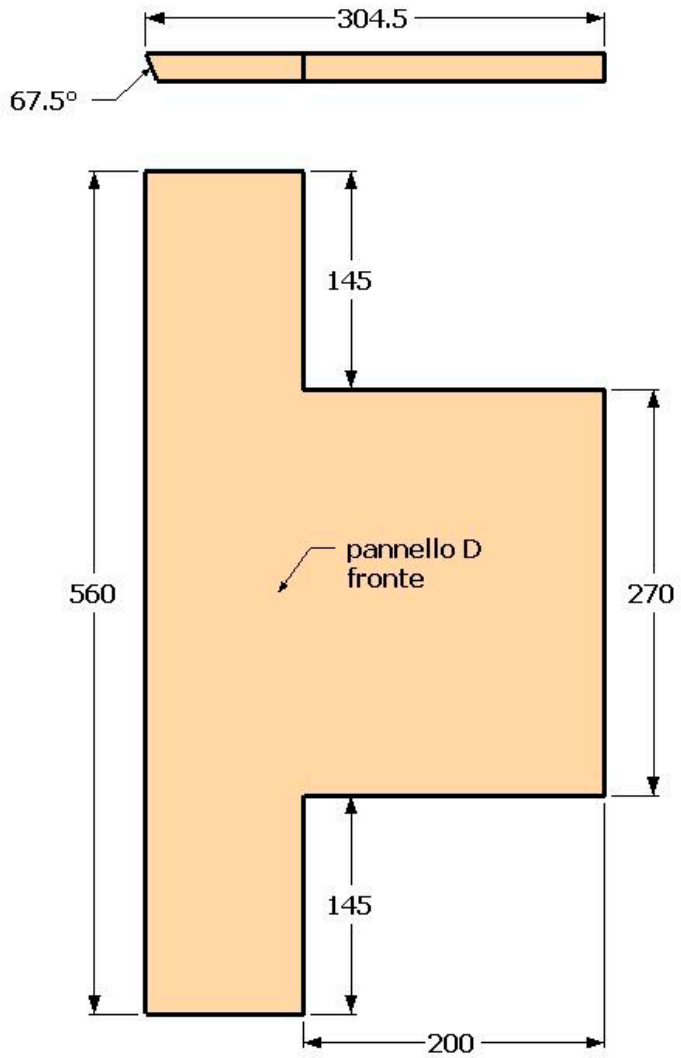
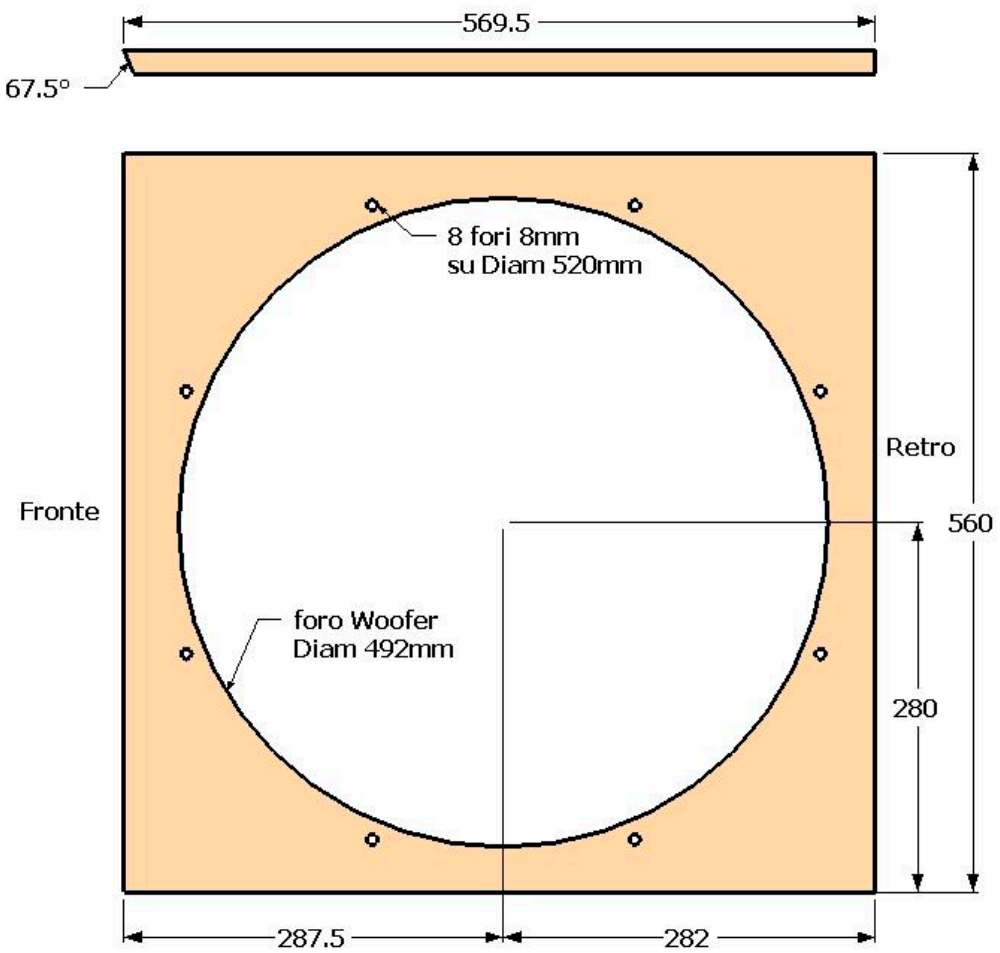
DETAILS: PART D AND F





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