EIGHTEEN SOUND

PROFESSIONAL LOUDSPEAKERS

APPLICATION NOTE

BUILDING AN EFFECTIVE, HIGH PERFORMANCES, 2 WAY, 12" LOUDSPEAKER SYSTEM

KEY FEATURES

> An effective, high performance and easy to build two way loudspeaker system for high performance in a very compact and portable enclosure.

> An "already optimized" passive crossover network greatly simplifies the system setup.

> The 12W700 woofer has been combined with the ND1090, Neodymium Compression Driver, mounted on a XT1086 horn in order to obtain smooth frequency response, precision directivity control and high power handling.

> Unique 18 Sound Elliptical-Spheroidal waveguide technology assures constant coverage at mid and high frequency with precision and stability, and good array-ability if used in multiple units.

> Due to the ND1090 special design, unique in the market featuring a lowered resonance frequency (about 700Hz), it has been possible to set a relatively low crossover frequency for a 1" Compression Driver (1.6kHz) yielding improved directivity control and definition, still not sacrificing power handling.

> The 12ND830 woofer is the perfect option if equivalent sonic performaces are required while greatly reducing system weight as well.

12W700

GENERAL SPECIFICATIONS

NOMINAL DIAMETER	300 mm (12 in)
RATED IMPEDANCE	8 Ohm
CONTINUOUS PINK NOISE	450W
SENSITIVITY	98 dB
FREQUENCY RANGE	55 ÷ 4200 Hz
MAX RECOMM. FREQUENCY	1700 Hz
RECOMM. ENCLOSURE VOLUME	40 ÷ 90 lt (1.41÷3.18 cuft)
VOICE COIL DIAMETER	75 mm (3 in)
NET WEIGHT	8,2 kg (18,1 lb)

THIELE SMALL PARAMETERS

Fs	58 Hz
Re	5.7 Ohm
Sd	0.0531sq mt. (82.31sq.in.)
Qms	3.93
Qes	0.37
Qts	0.36
Vas	55 lt. (1,94 cuft)
Mms	51 gr. (0,11 lb)
BL	17,7 Tm
Linear mathematical Xmax	± 6,5 mm (± 0,26 in)
Le (1kHz)	1,48 mH
Ref. Efficiency 1W@1m (half space)	97,2 dB

ND1090

GENERAL SPECIFICATIONS

THROAT DIAMETER	25.4 mm (1in)
RATED IMPEDANCE	8 Ohm
DC RESISTANCE	5.3 Ohm
MINIMUM IMPEDANCE	7 Ohm at 4000 Hz
LE (at 1KHz)	120 μH
AES POWER	50W above 1.6 kHz
PROGRAM POWER	100W above 1.6 kHz
SENSITIVITY (1W@1m)	110 dB

FREQUENCY RANGE	1600 Hz ÷ 20 kHz
RECOMM. XOVER FREQUENCY	1600 Hz (12dB/oct slope)
DIAPHRAGM MATERIAL	Titanium - PEN
VOICE COIL DIAMETER	44.4mm (1 3/4 in)
VOICE COIL WINDING MATERIAL	Edge-wound aluminum
MAGNET MATERIAL	Neodymium
FLUX DENSITY	2 T
BL FACTOR	9.1 N/A

XT1086

GENERAL SPECIFICATIONS

THROAT DIAMETER	25.4 mm (1in)
HORIZONTAL COVERAGE (-6dB)	80° (1 ÷ -8) average range (1,6kHz - 12,5kHz)
VERTICAL COVERAGE (-6dB)	60° (18 ÷ -7) average range (1,6kHz - 12,5kHz)
DIRECTIVITY INDEX	10 dB (1.3 ÷ -0,4) average range (1.6kHz - 12.5kHz)
USABLE FREQUENCY RANGE	above 800 Hz
RECOMM. CROSS FREQUENCY	1200 Hz or more
SENSITIVITY (ON AXIS)	110 dB
FREQUENCY RANGE	1200 Hz ÷ 20kHz

MOUNTING INFORMATION

OVERHALL DIMENSIONS - Mouth height - Mouth width - Depth	 215 mm (8,5 in) 260 mm (10,2in) 126 mm (5 in)
MOUTH MOUNTING DIMENSIONS	4 Ø6 holes on the edge of rectangle with 214mm x 169mm (8,43x6,65 in) sides
DRIVER MOUNTING DIMENSIONS	3 Ø6 holes on ø 57mm (2.24in) - 4 M6 holes on ø 76mm (3in)
NET WEIGHT	1 Kg (2,20 lb)

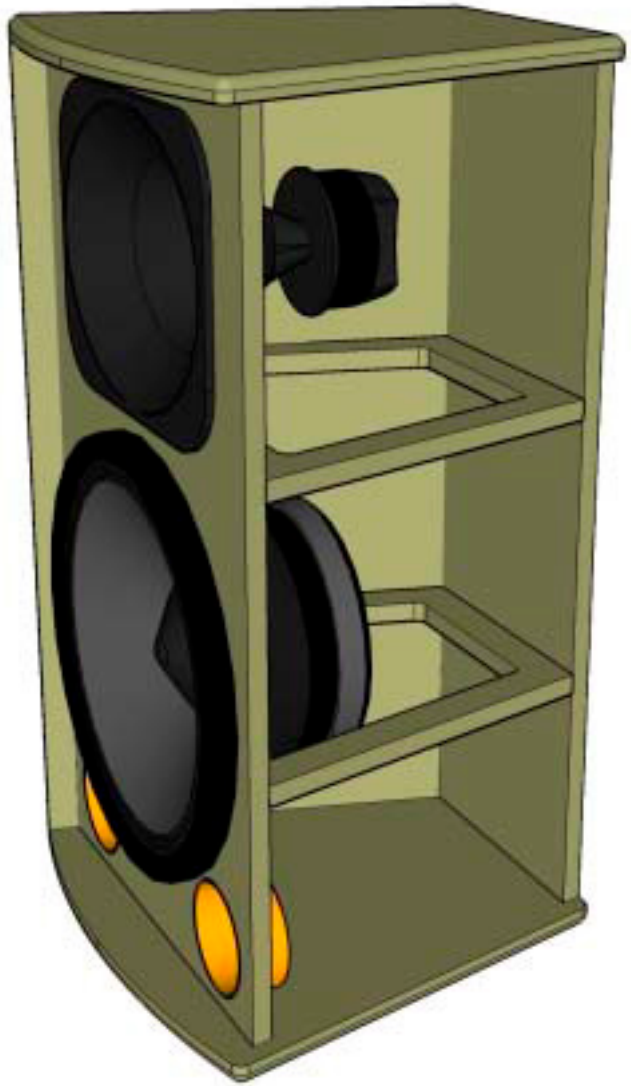
KEY FEATURES

> The enclosure should be made out of Baltic birch plywood (15mm thick).

> The vents can be made with standard plastic pipe with internal diameter of 78mm and 35mm deep.

> All the used bolts should be the M5 type (5mm diameter), 35mm deep. "8.8" steel type or better is strongly suggested.

> M5 T-Nuts are recommended to be used in conjunction with M5 bolts.



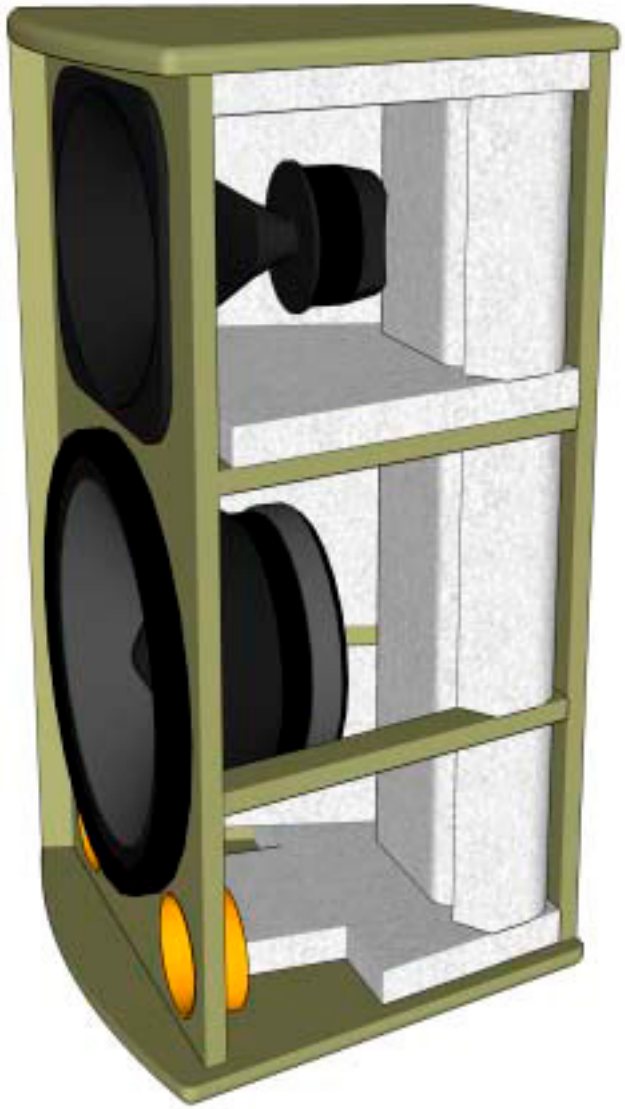
INTERNAL VIEW

KEY FEATURES

> It's strictly necessary to provide for proper cabinet internal acoustical damping with absorptive material.

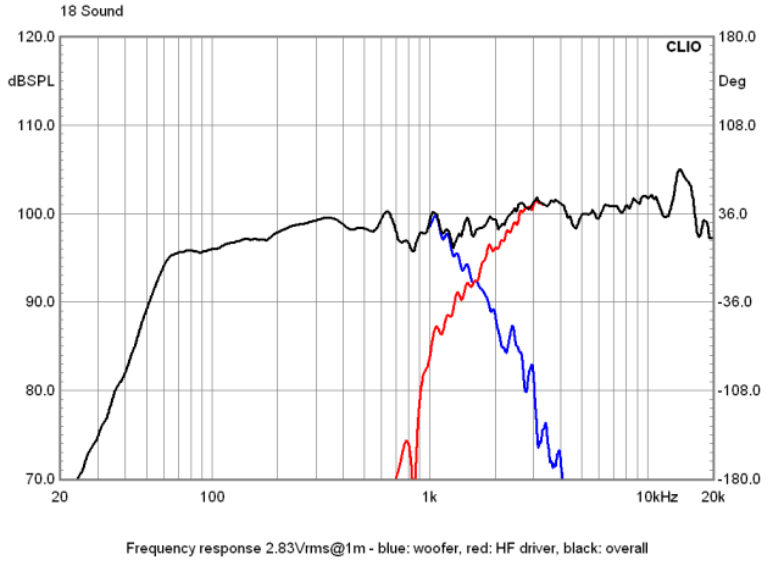
> High density damping material, such as Dacron or other synthetic fibers, is required for best performance.

> The following example image show the proper damping material disposition.

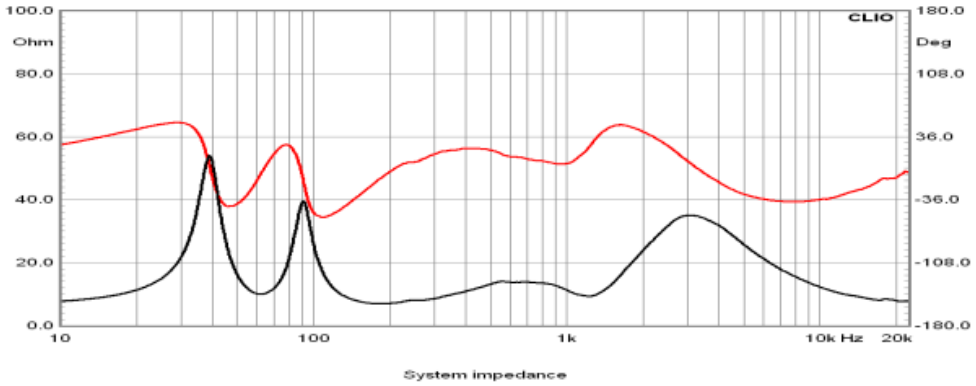


DAMPING DISPOSITION

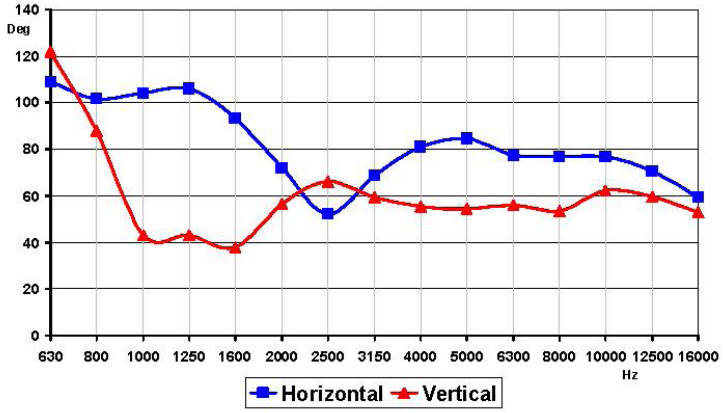
MEASUREMENTS: 12W700 + ND1080/XT1086



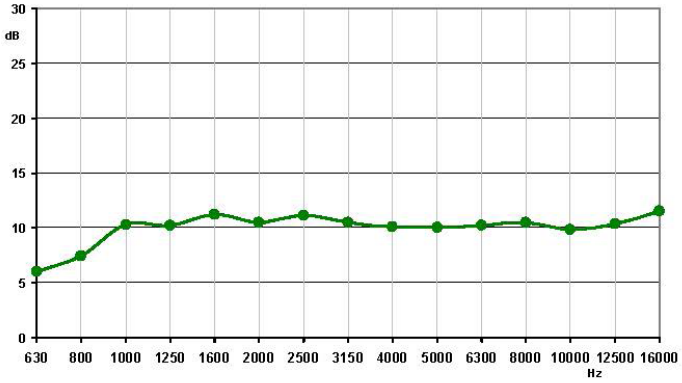
FREQUENCY RESPONSE



IMPEDANCE CURVE



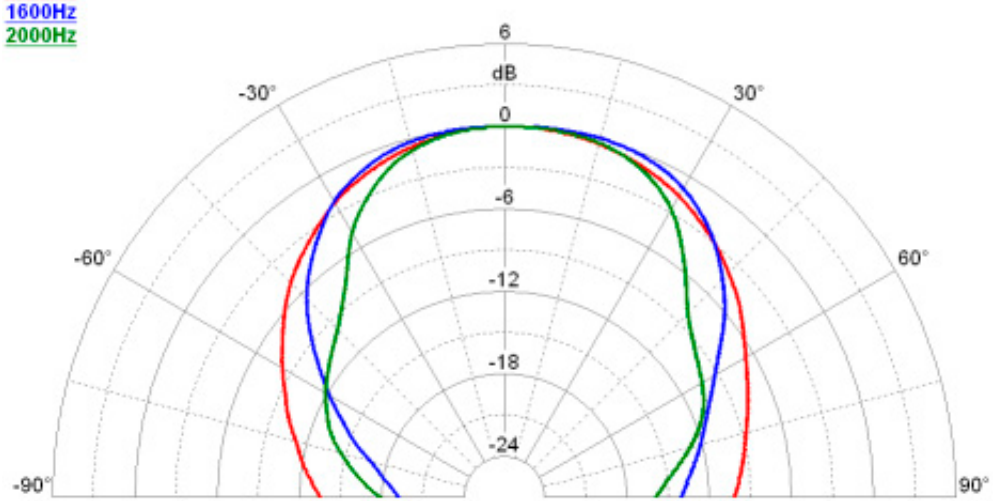
BEAMWIDTH



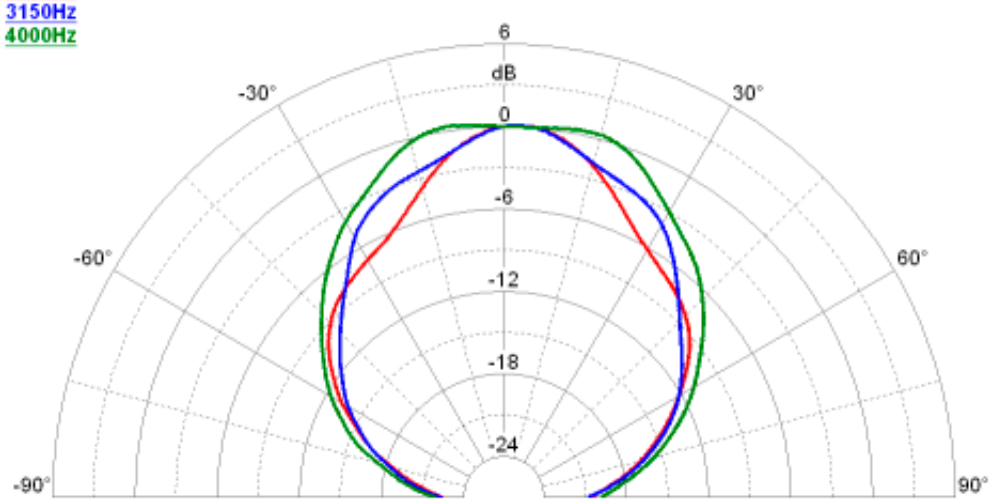
DIRECTIVITY INDEX

HORIZONTAL POLAR RESPONSE

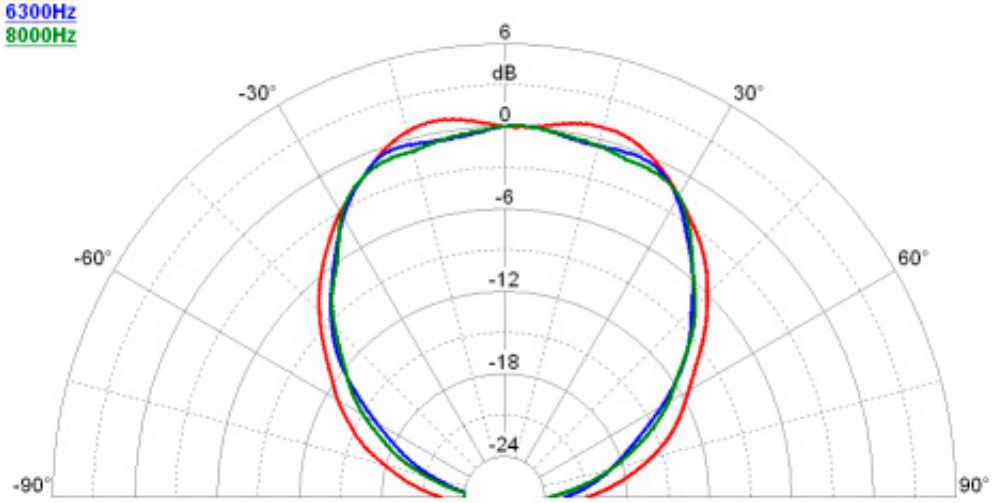
1250Hz
1600Hz
2000Hz



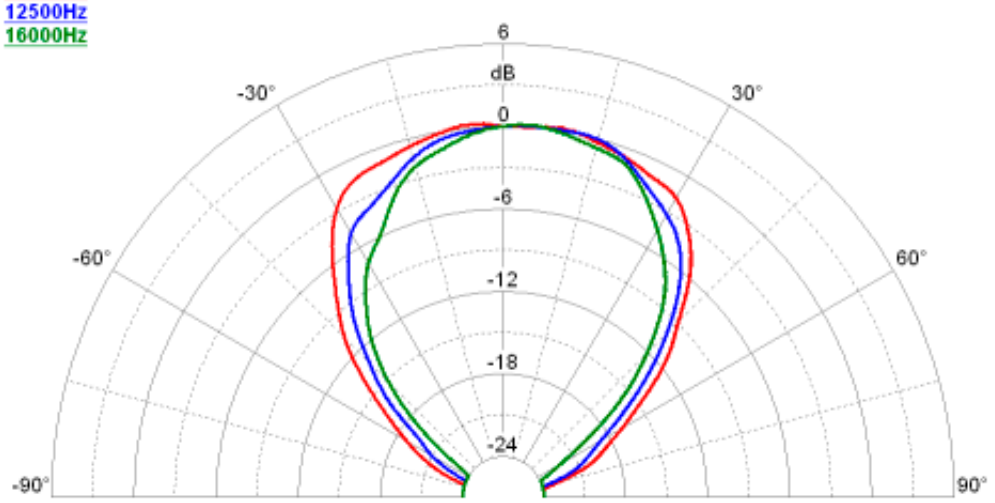
2500Hz
3150Hz
4000Hz



5000Hz
6300Hz
8000Hz

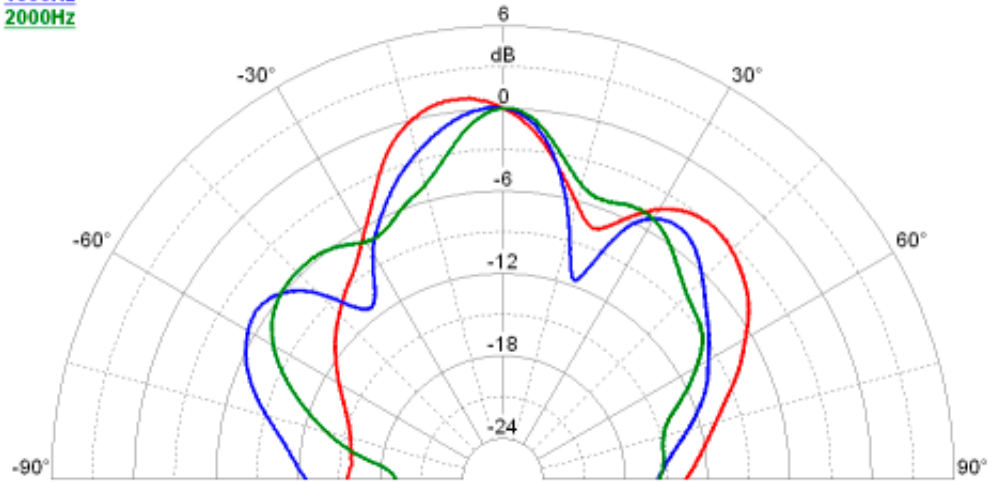


10000Hz
12500Hz
16000Hz



VERTICAL POLAR RESPONSE

1250Hz
1600Hz
2000Hz



2500Hz
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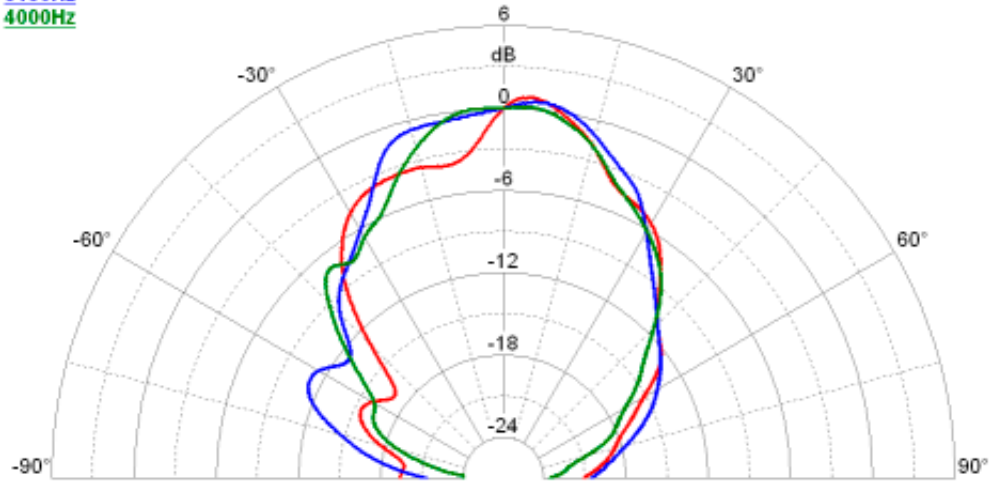
4000Hz



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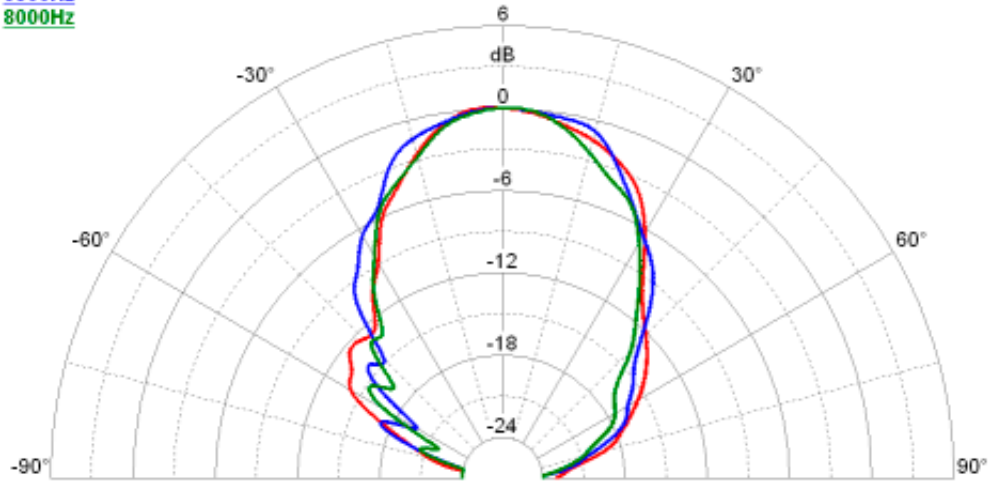
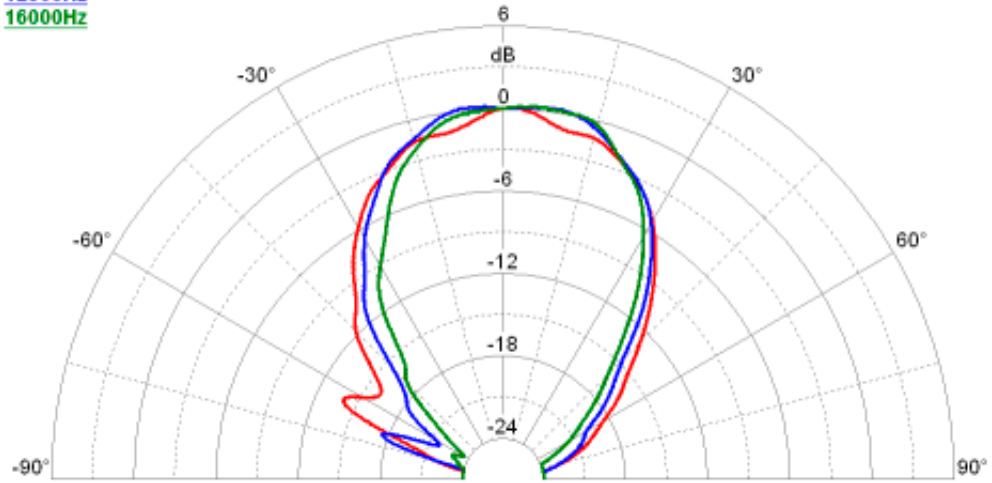
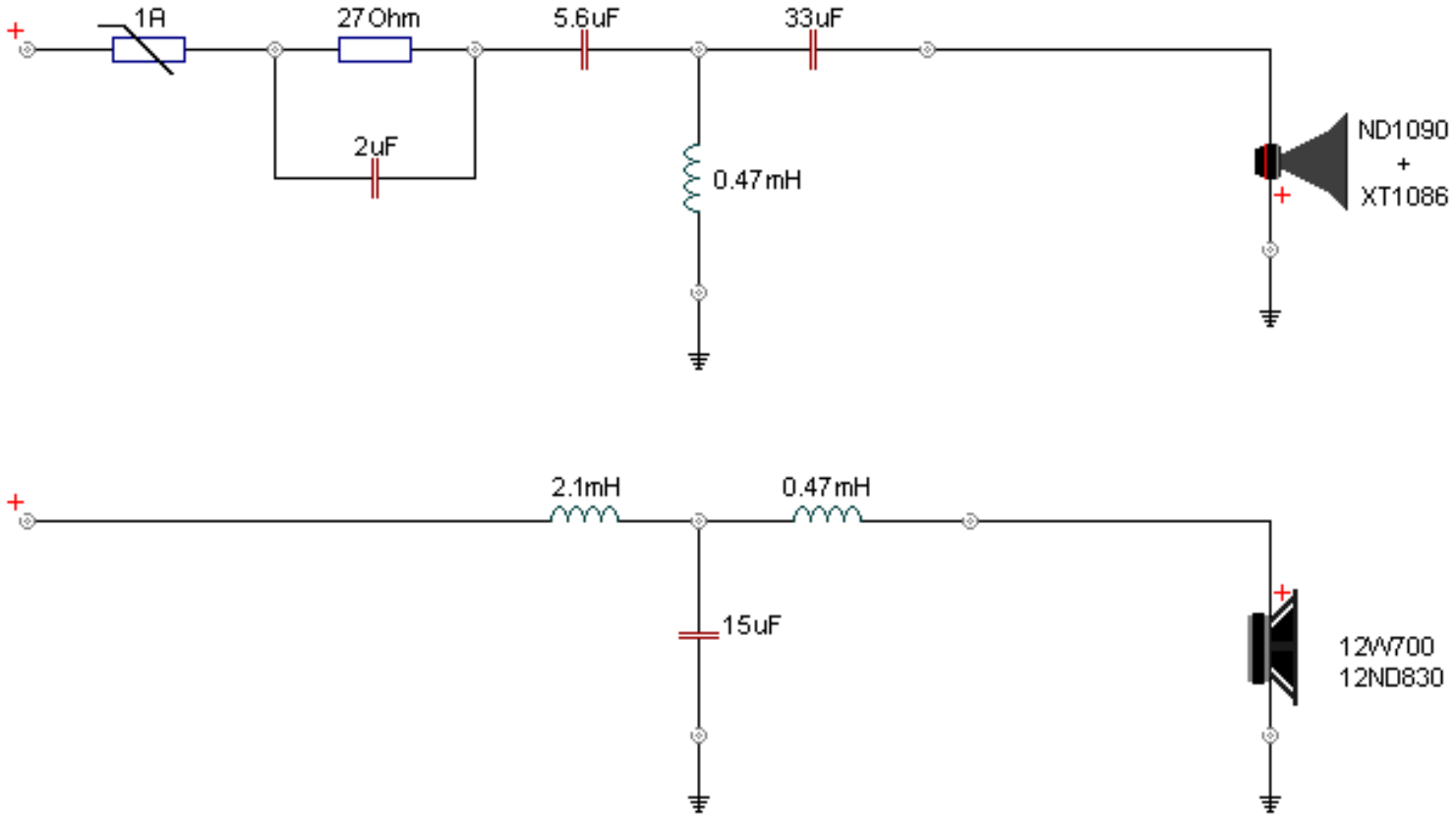


10000Hz
12500Hz
16000Hz

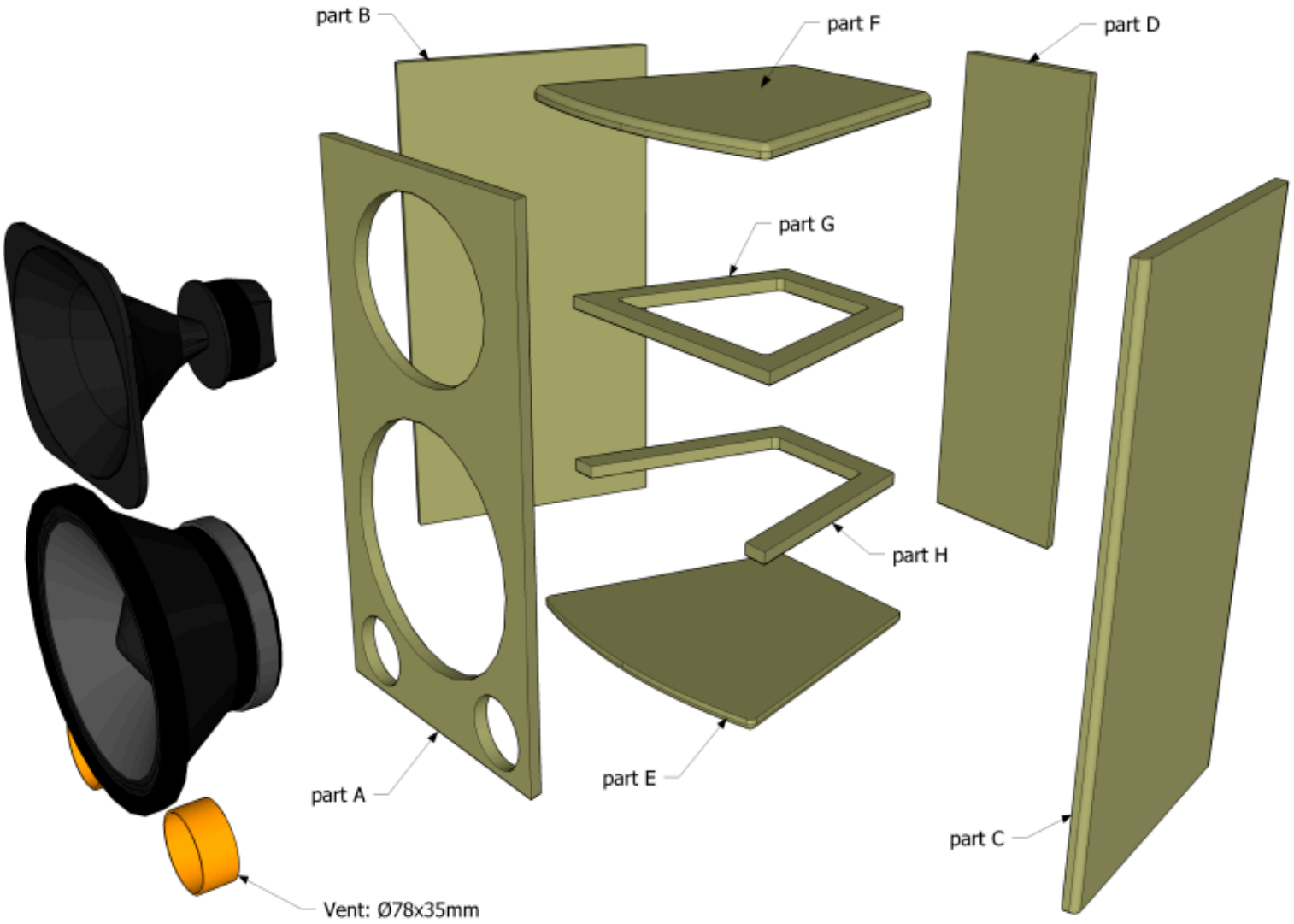


CROSSOVER SCHEMATICS

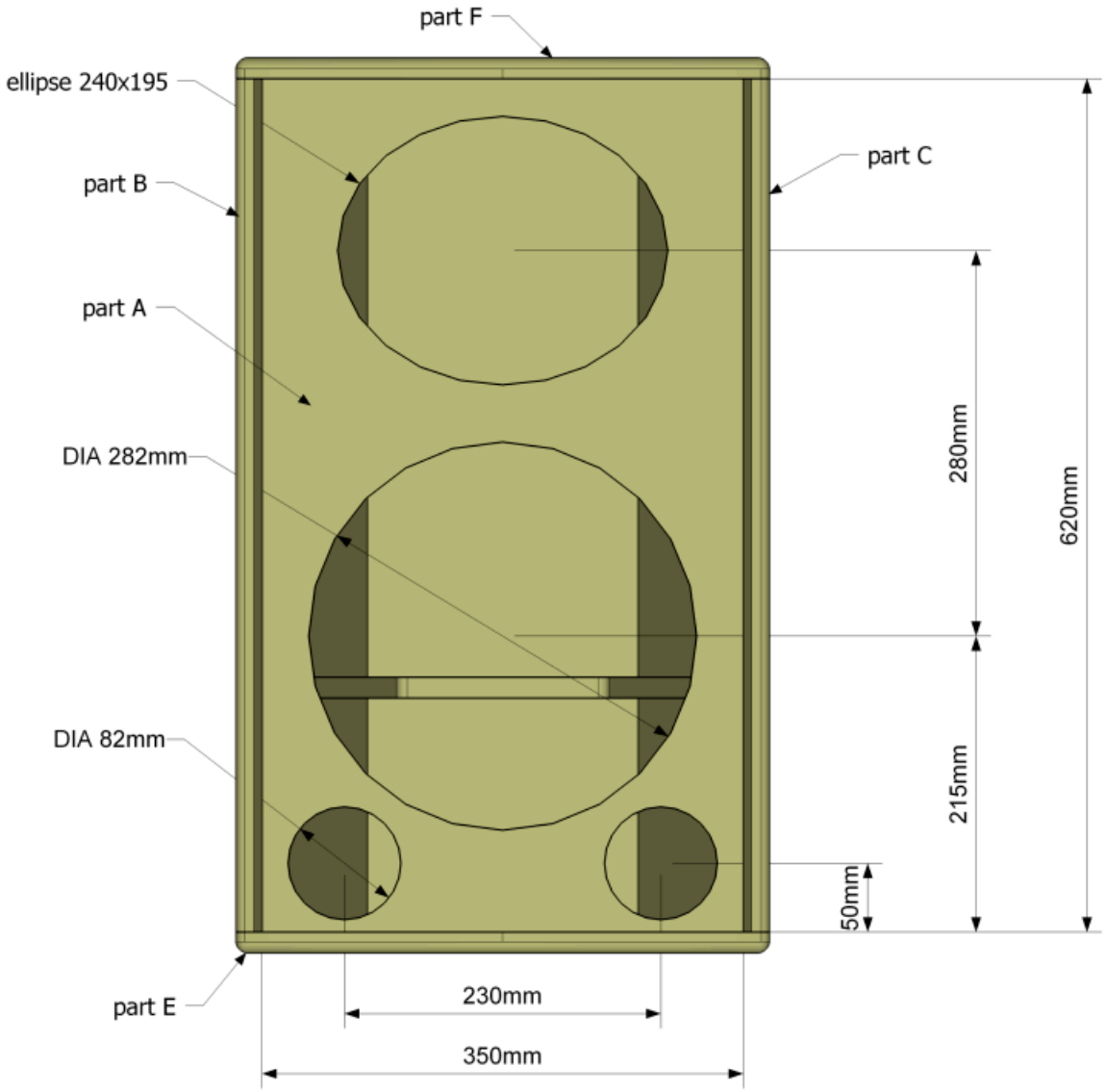
COMPONENTS LIST		
TYPE	VALUE	NOTE
Resistor	27 Ohm	>20W
Capacitor	2 uF	5% - >250V
Capacitor	5.6 uF	5% - >250V
Inductor	0.47 mH	<0.4 Ohm
Capacitor	33 uF	5% - >250V
Inductor	2.1mH	<1.4 Ohm
Capacitor	15uF	5% - >250V
Inductor	0.47mH	<0.4 Ohm
PTC	1A	



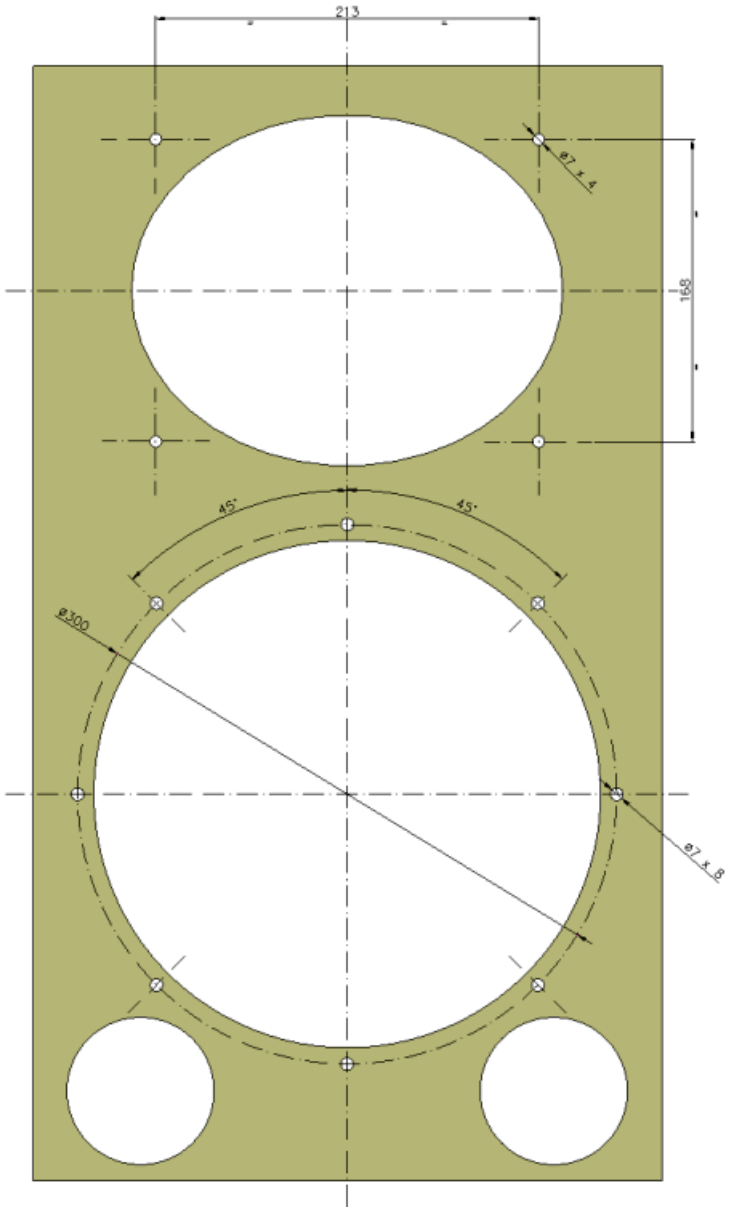
EXPLODED VIEW



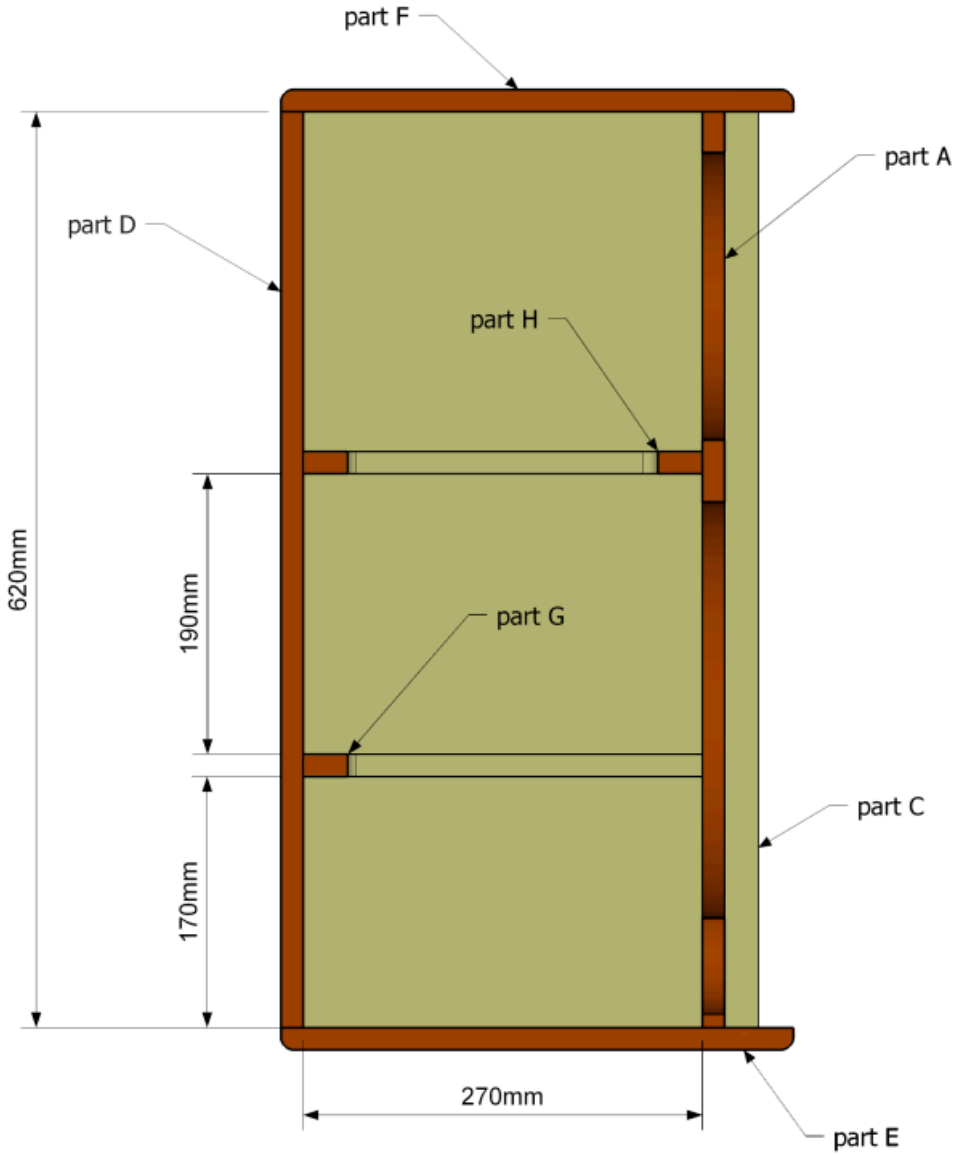
FRONT VIEW



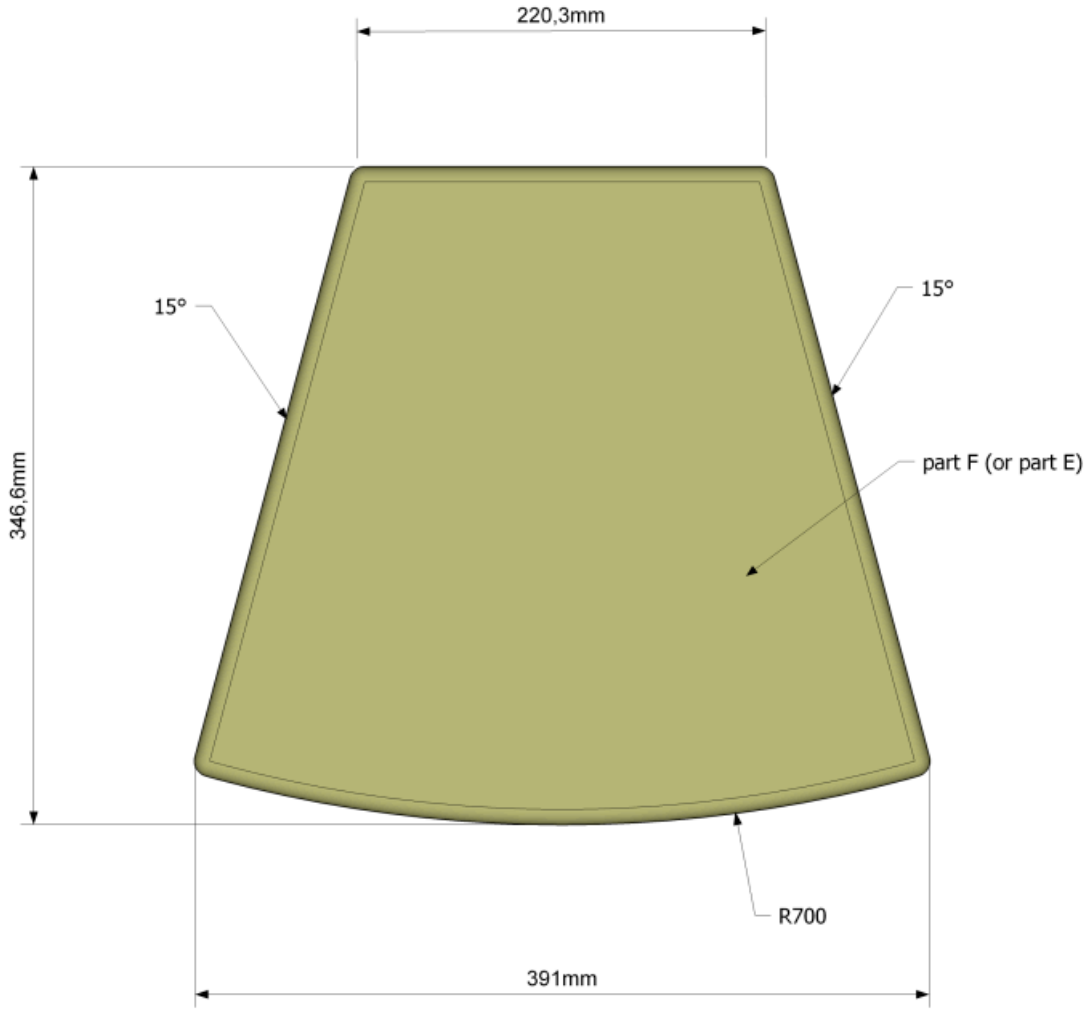
FRONT PANEL: BOLTS HOLES



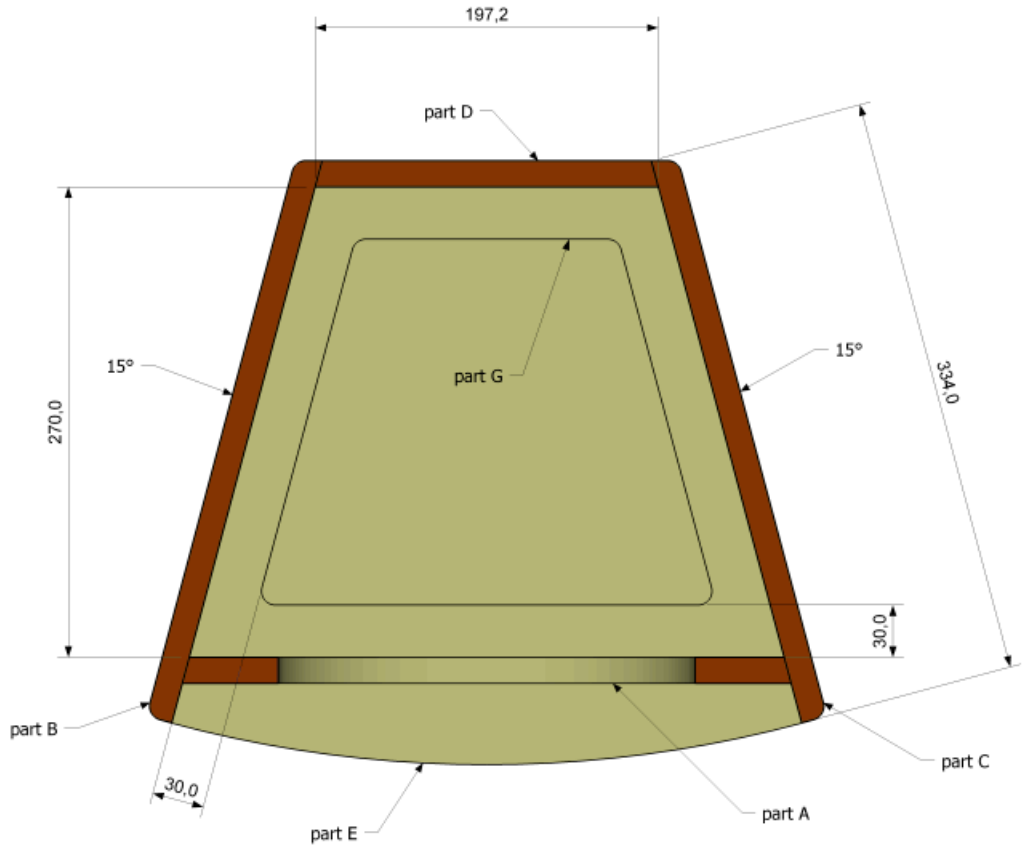
SIDE VIEW



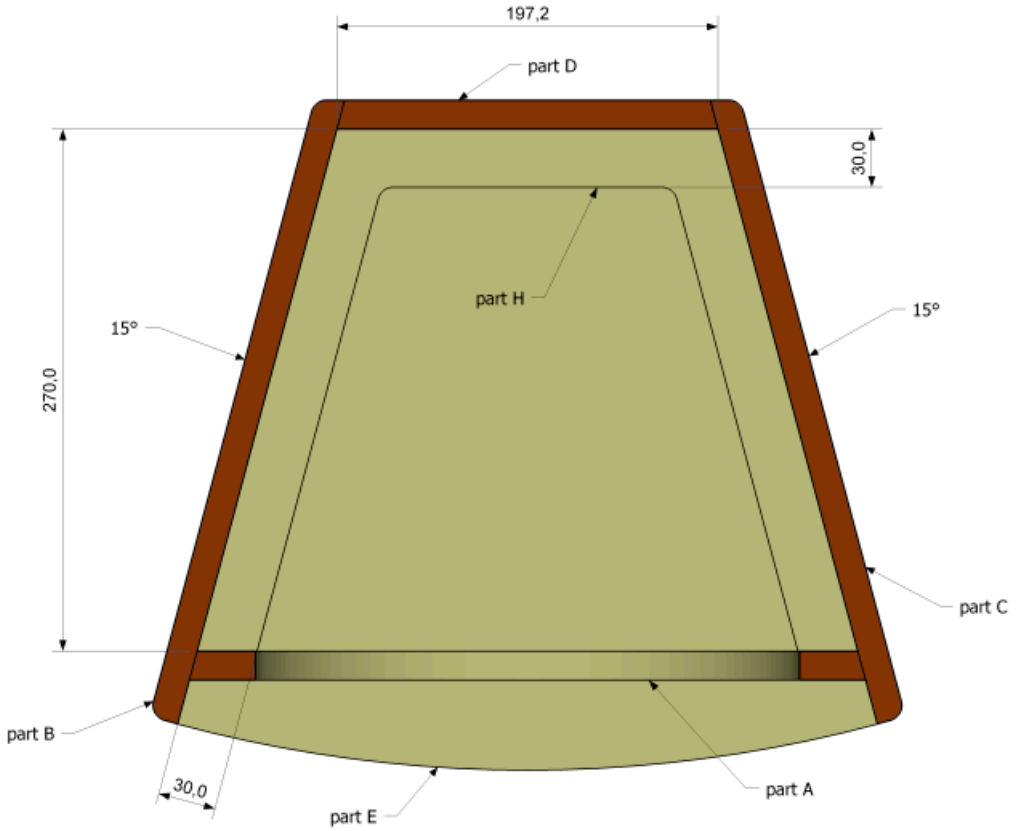
TOP VIEW



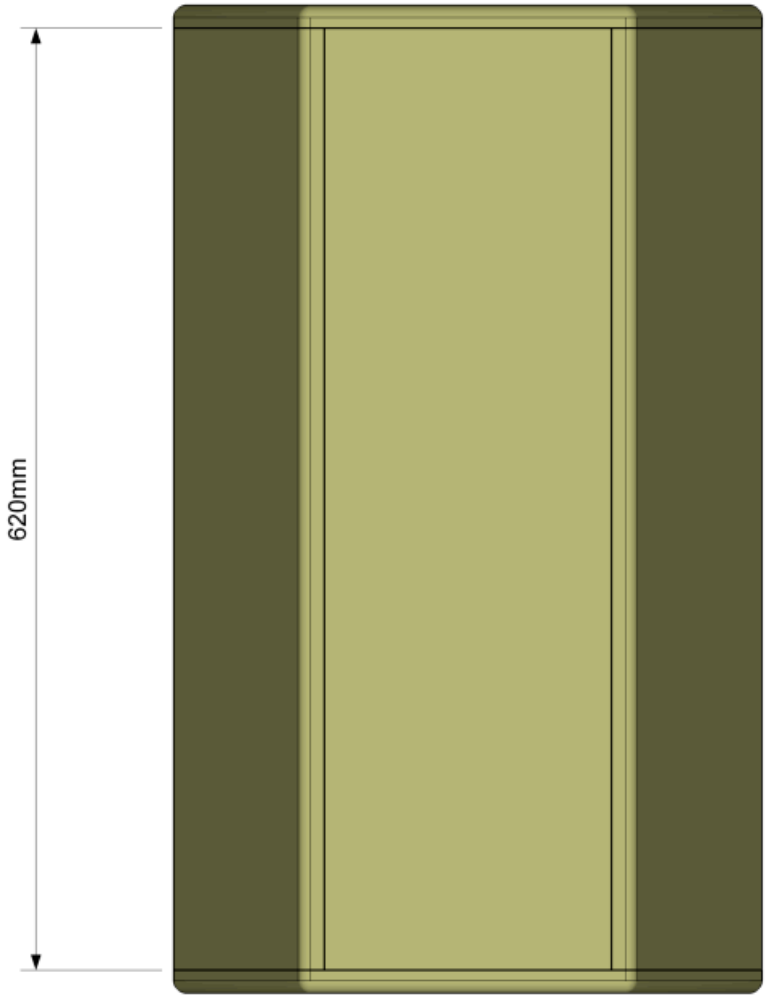
TOP VIEW SECTION: HORN HEIGHT SECTION



TOP VIEW SECTION: WOOFER HEIGHT SECTION



BACK VIEW



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