

Building an effective, high performances, 2 way, 12" loudspeaker system



Eighteen Sound

A division of A.E.B srl

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2 way 12" kit

- 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 performances are required while greatly reducing system weight as well.



2 way 12" kit

12W700 12ND830



GENERAL SPECIFICATIONS				
NOMINAL DIAMETER	300mm	(12 in)	300mm	(12 in)
RATED IMPEDANCE	8 ohms		8 ohms	
CONTINUOUS PINK NOISE (1)	450 W		450 W	
SENSITIVITY (2)	99 dB		98 dB	
FREQUENCY RANGE (3)	53 ÷ 5000 Hz		55 ÷ 4200 Hz	
MAX. RECOMM. FREQUENCY	2000 Hz		1700 Hz	
RECOMM. ENCLOSURE VOLUME	40 ÷ 100 lt.	(1,41 ÷ 3,53 cu ft)	40 ÷ 90 lt.	(1,41 ÷ 3,18 cuft)
VOICE COIL DIAMETER	75 mm	(3 in)	75 mm	(2,95 in)
NET WEIGHT	4 kg	(8,83 lb)	8,2 kg	(18,1 lb)
THIELE-SMALL PARAMETERS (4)				
Fs	55 Hz		58 Hz	
Re	5,7 ohms		5,7 ohms	
Sd	0,0531 sq.mt.	(82,31 sq.in.)	0,0531 sq.mt.	(82,31 sq.in.)
Qms	5,15		3,93	
Qes	0,296		0,37	
Qts	0,28		0,36	
Vas	72 lt.	(2,54cuft)	55 lt.	(1,94 cuft)
Mms	46 gr.	(0,10 lb)	51 gr.	(0,11 lb)
BL	17,6 Tm		17,7 Tm	
Linear Mathematical Xmax (5)	±6,5 mm	(± 0,26 in)	± 6,5 mm	(± 0,26 in)
Le (1kHz)	1,5 mH		1,48 mH	
Ref. Efficiency				
1W@1m (half space)	98,3 dB		97,2 dB	

ND1090



GENERAL SPECIFICATIONS	
THROAT DIAMETER	25,4 mm (1 in)
RATED IMPEDANCE	8 Ohm
DC RESISTANCE	5,3 Ohm
MINIMUM IMPEDANCE	7 Ohm at 4000Hz
POWER HANDLING	
CONTINUOUS PINK NOISE (1)	50W above 1,6 kHz
CONTINUOUS PROGRAM (2)	100W above 1,6 kHz
SENSITIVITY (1W@1m) (3)	110 dB
FREQUENCY RANGE	1600Hz ÷ 20kHz
RECOMM. XOVER FREQUENCY	1600Hz (12dB/oct slope)
DIAPHRAGM MATERIAL	Pure Titanium dome
VOICE COIL DIAMETER	44 mm (1 3/4 in)
MAGNET MATERIAL	Neodymium
FLUX DENSITY	2 T
OVERALL DIAMETER	92 mm (3,6 in)
TOTAL DEPTH	53 mm (2,1 in)
NET WEIGHT	1,2 kg (2,6 lb)

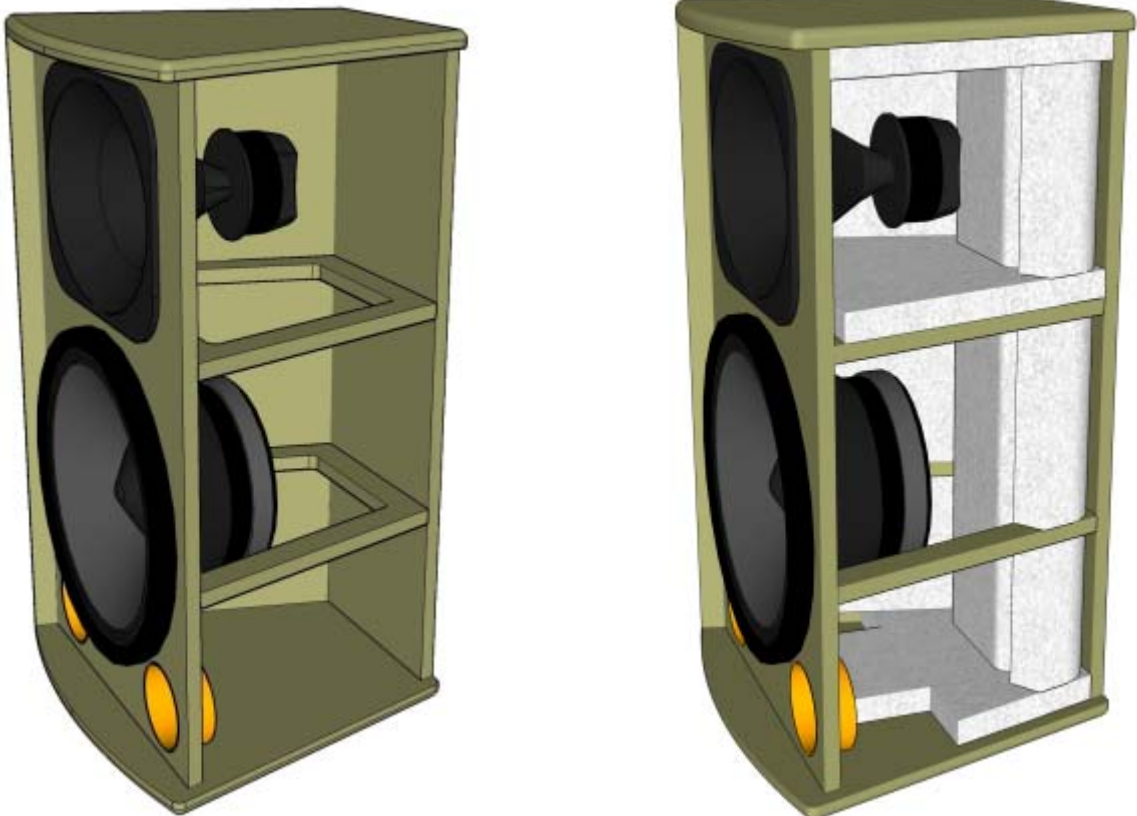
XT1086



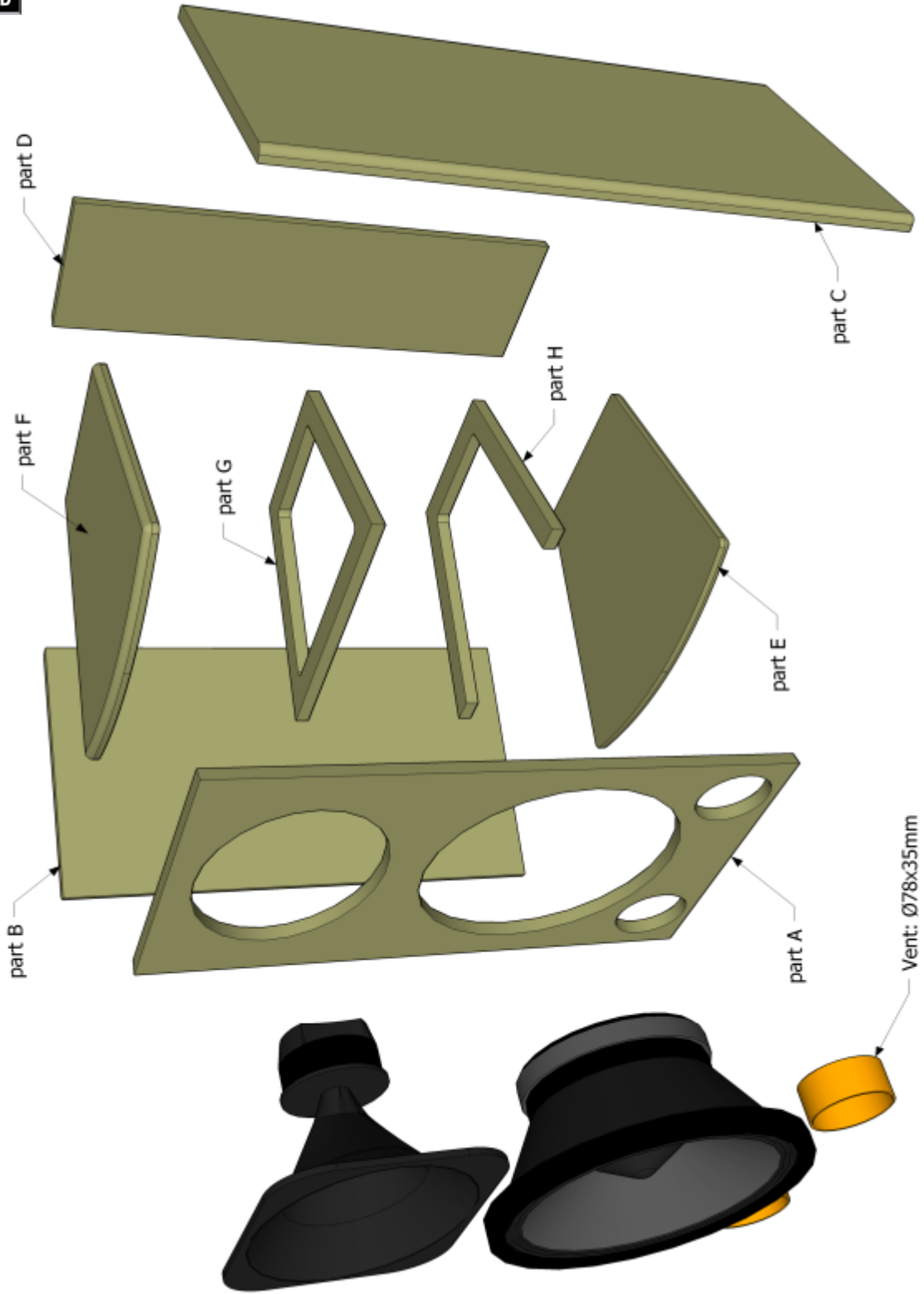
GENERAL SPECIFICATIONS	
THROAT DIAMETER	25,4 mm (1 in)
HORIZONTAL COVERAGE (-6dB)	80° (+1, -8) average range (1,6KHz - 12,5KHz)
VERTICAL COVERAGE (-6 dB)	60° (+18, -7) average range (1,6KHz - 12,5KHz)
DIRECTIVITY INDEX	15 dB (+1,3 -0,4) average range (1,6KHz - 12,5KHz)
USABLE FREQUENCY RANGE	Above 800 Hz
RECOMM. CROSS FREQUENCY	1200 Hz or more
SENSITIVITY (ON AXIS)	110 dB (1)
FREQUENCY RANGE	1200 Hz ÷ 18KHz
MOUNTING INFORMATION	
OVERALL DIMENSIONS	
MOUTH HEIGHT	215 mm (8,5 in)
MOUTH WIDTH	260 mm (10,2in)
DEPTH	126 mm (5 in)
MOUTH MOUNTING DIMENSIONS	4 ø 6 holes on the edge of rectangle
REAR HEIGHT	197 mm (7,8 in)
REAR WIDTH	242 mm (9,5 in)
NET WEIGHT	1 Kg (2,20 lb)

- 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.
- 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.

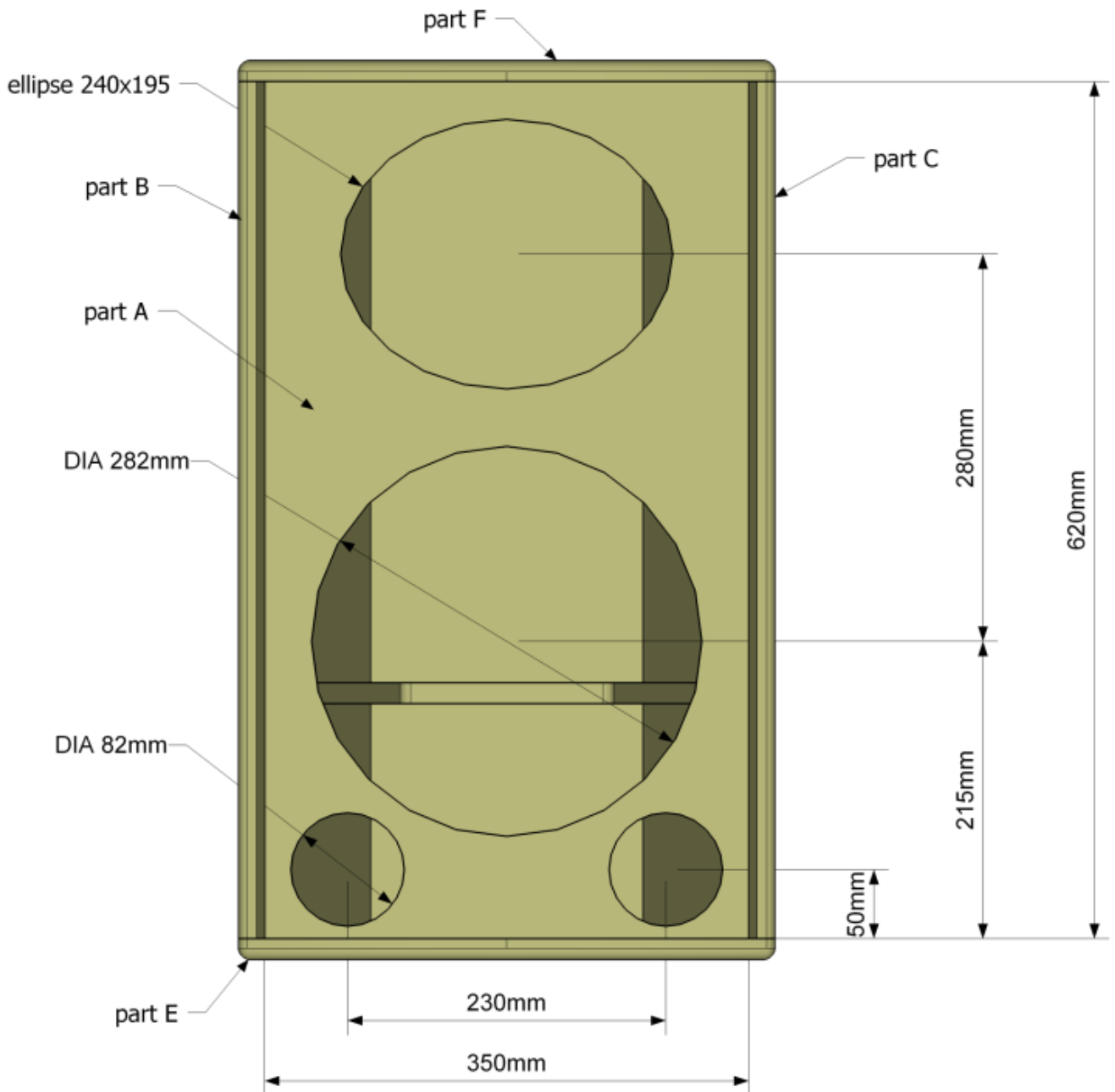
Internal view and damping disposition



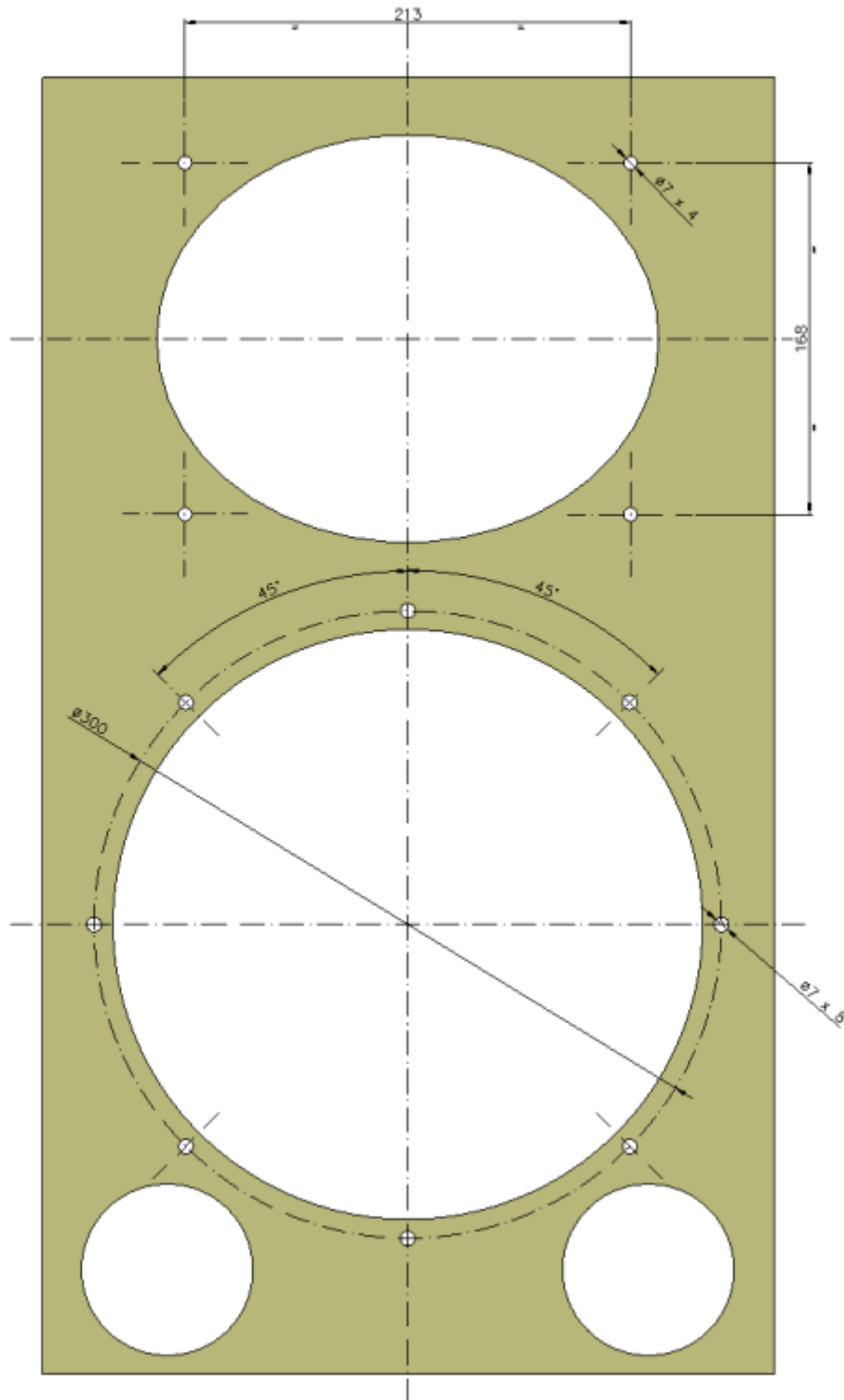
Exploded view



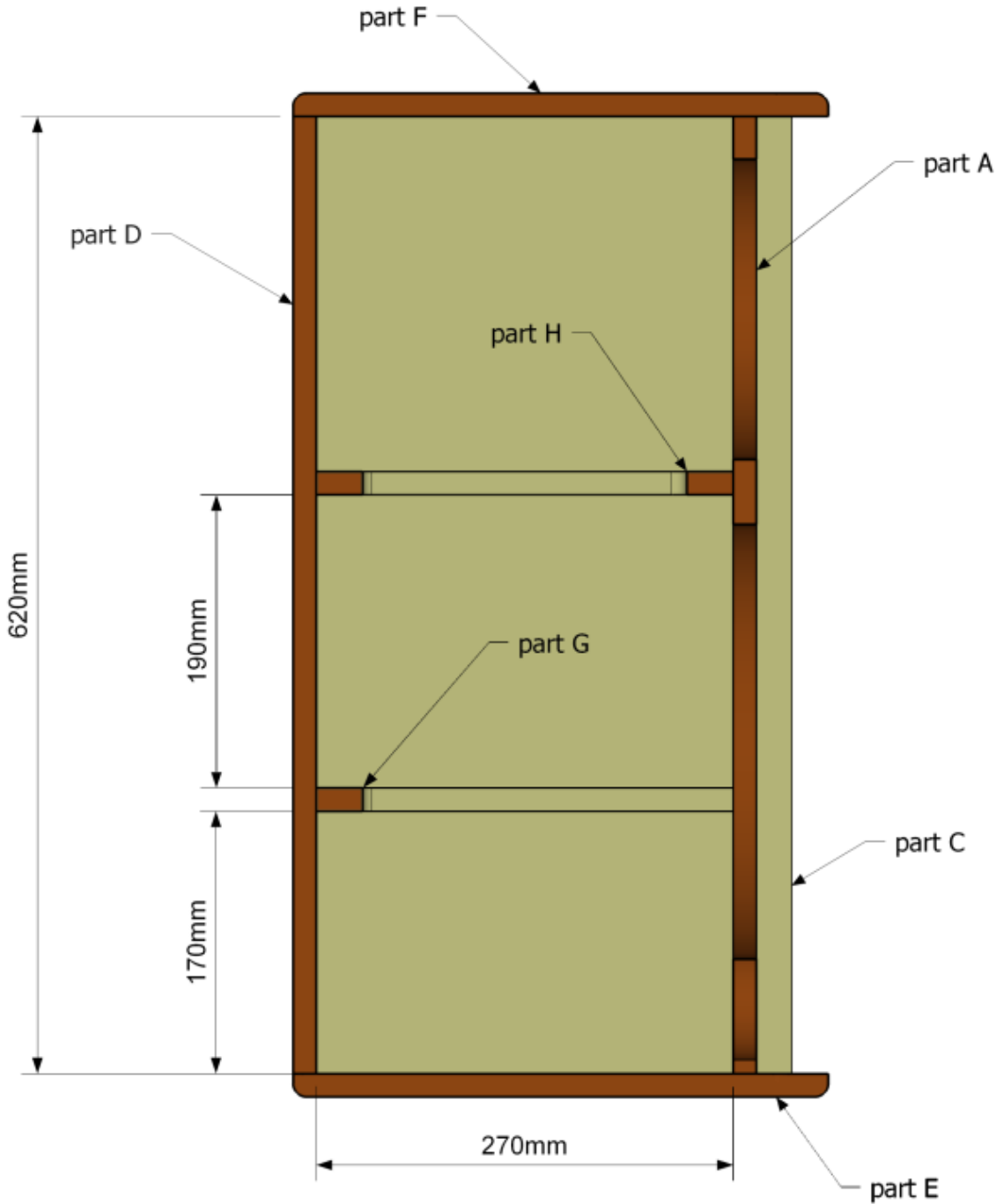
Front view



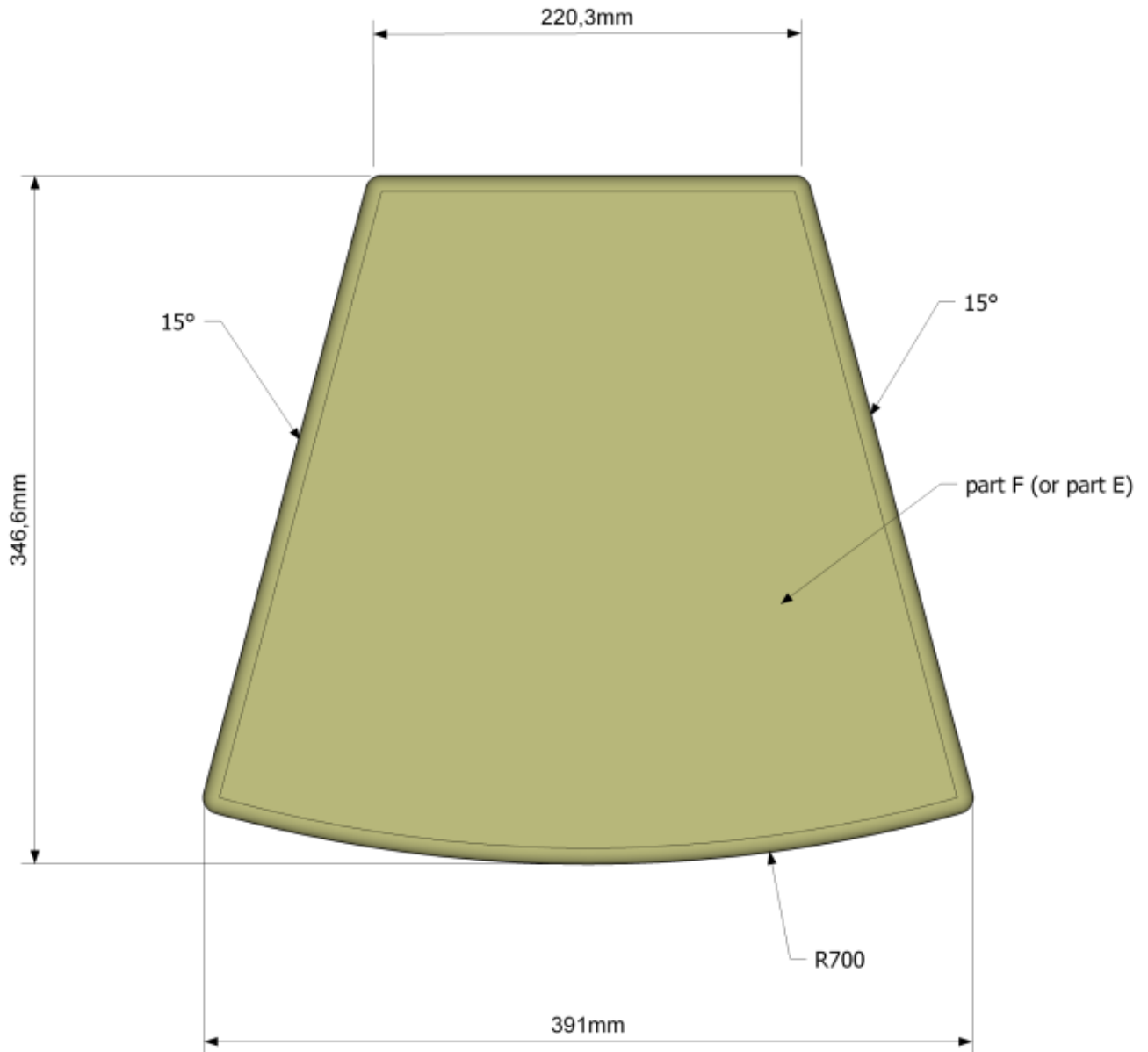
Front panel: bolts holes



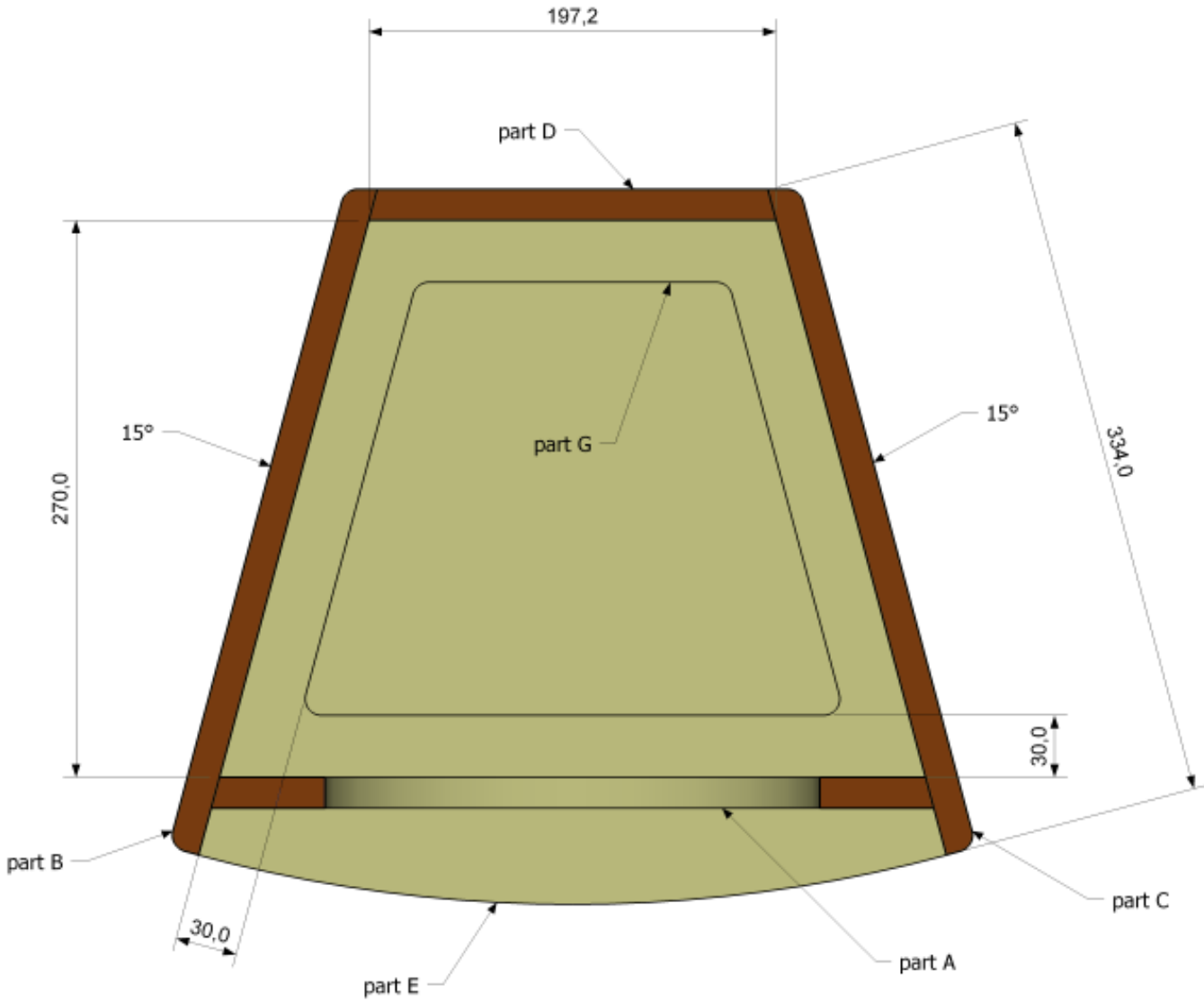
Side view



Top view

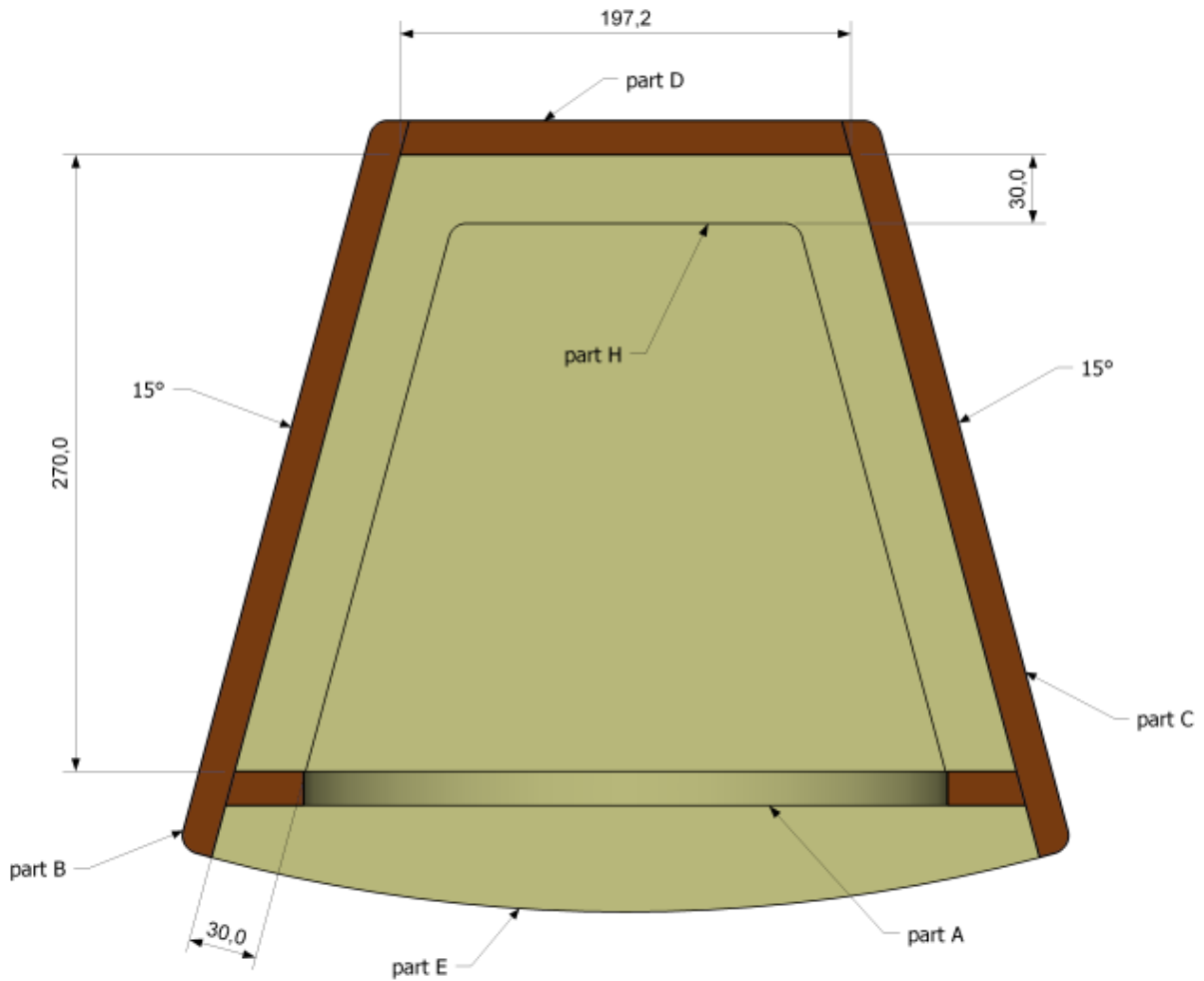


Top view section



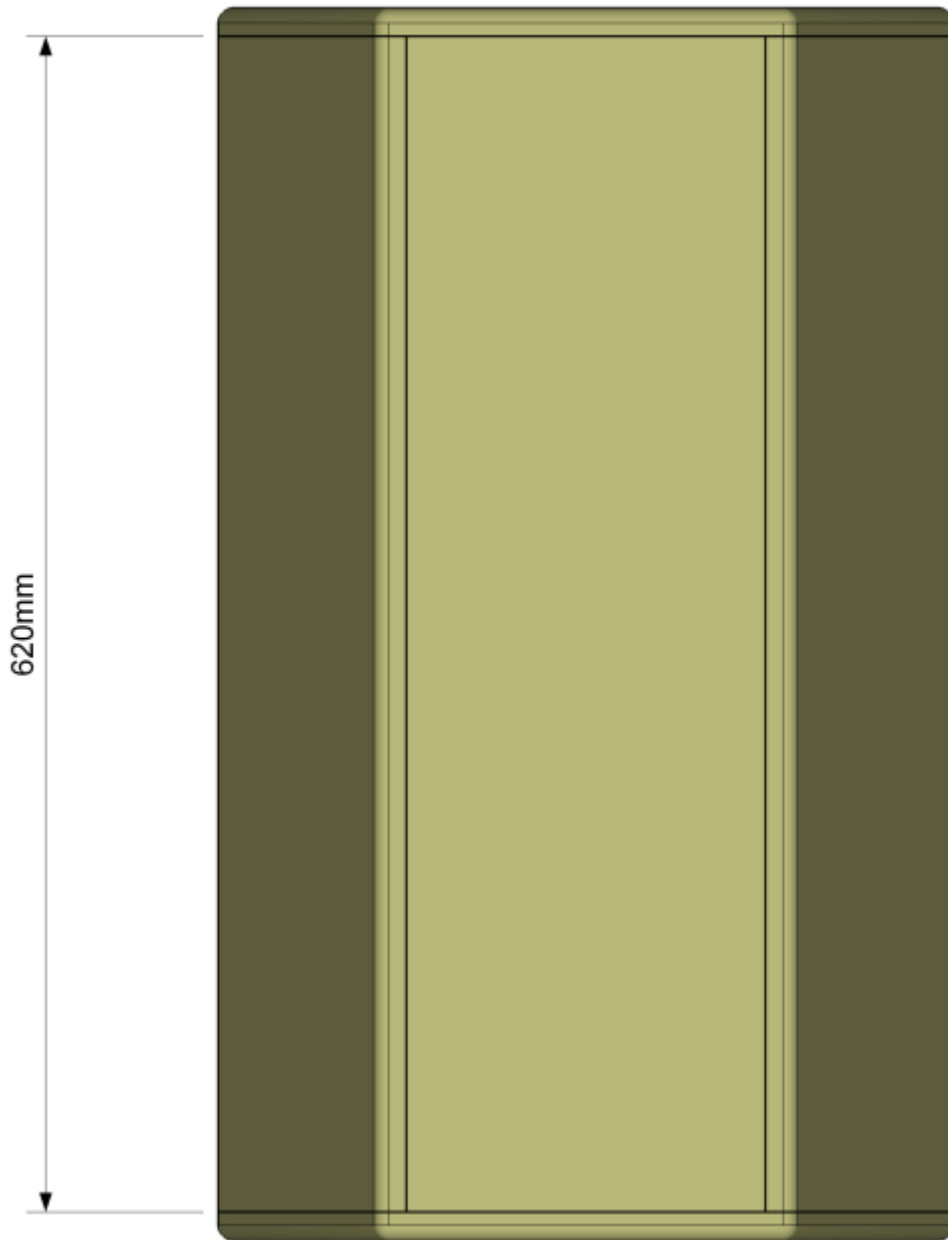
Horn height section

Top view section

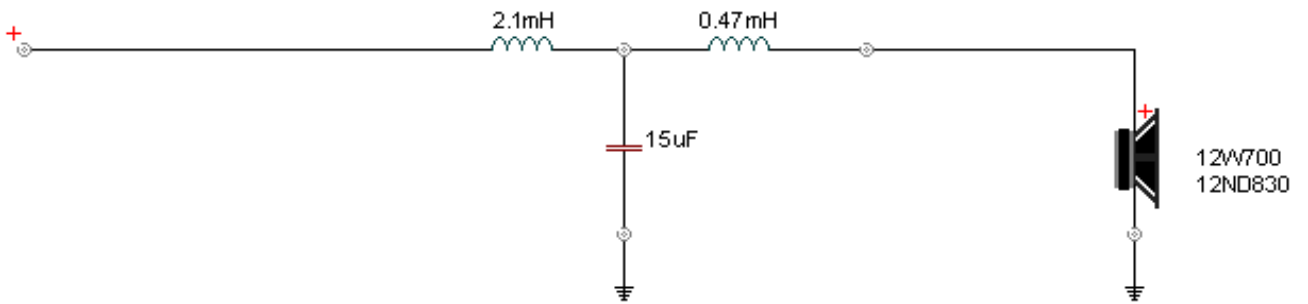
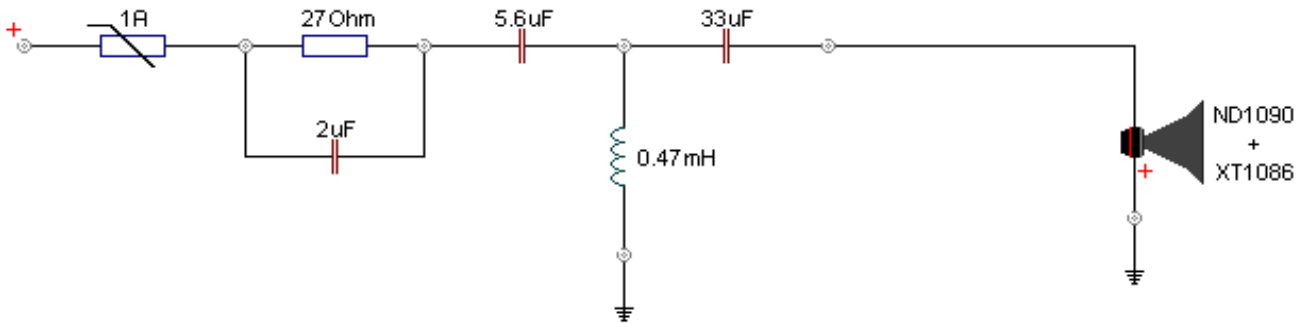


Woofer height section

Back view

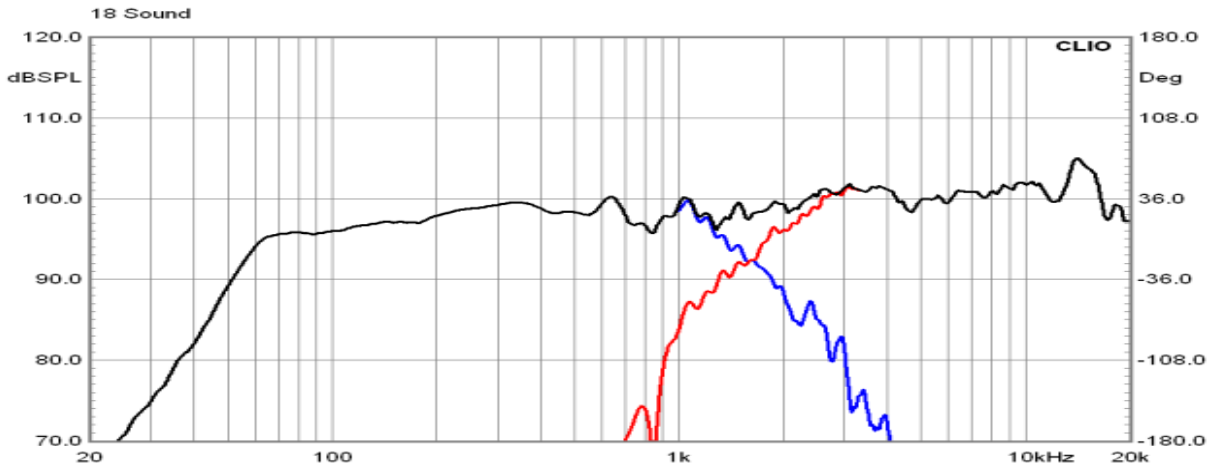


Crossover schematics

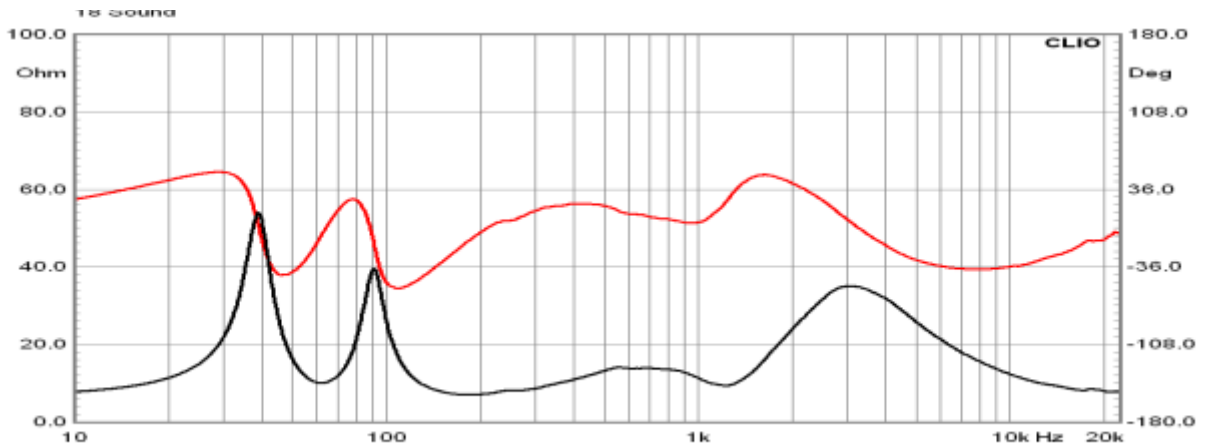


Components list		
Type	Value	Note
Resistor	27 Ohm	>20W
Capacitor	2uF	5% - >250V
Capacitor	5.6uF	5% - >250V
Inductor	0.47mH	<0.4 Ohm
Capacitor	33uF	5% - >250V
Inductor	2.1mH	<1.4 Ohm
Capacitor	15uF	5% - >250V
Inductor	0.47mH	<0.4 Ohm
PTC	1A	

Measurements: 12W700 + ND1090/XT1086

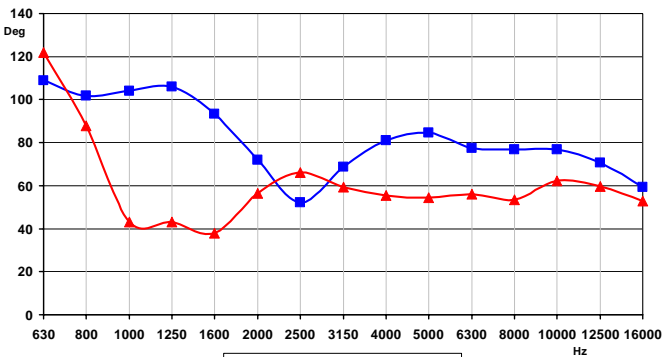


Frequency response 2.83Vrms@1m - blue: woofer, red: HF driver, black: overall



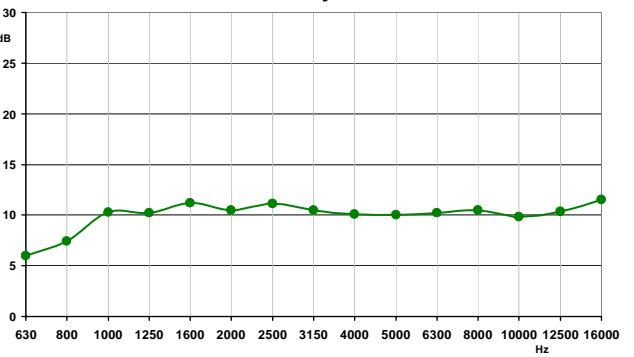
System impedance

Beamwidth

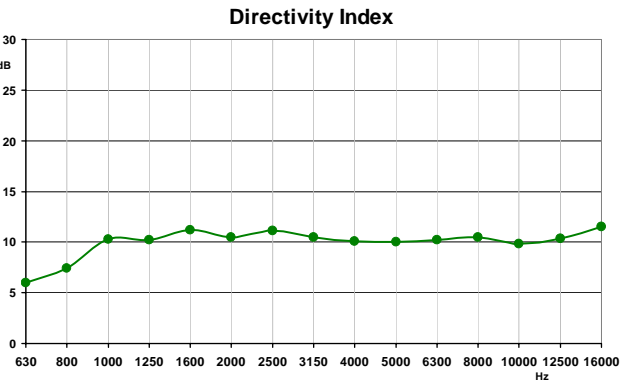
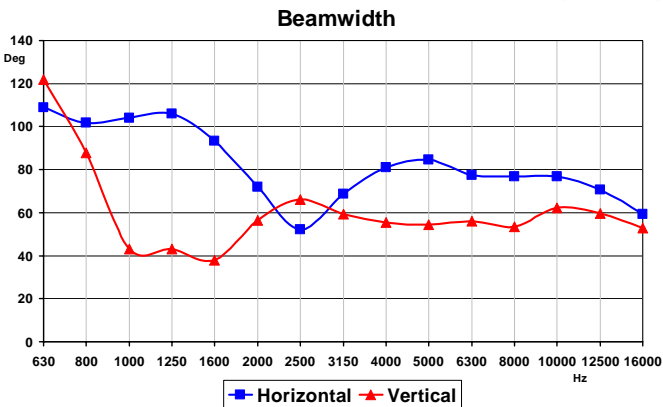
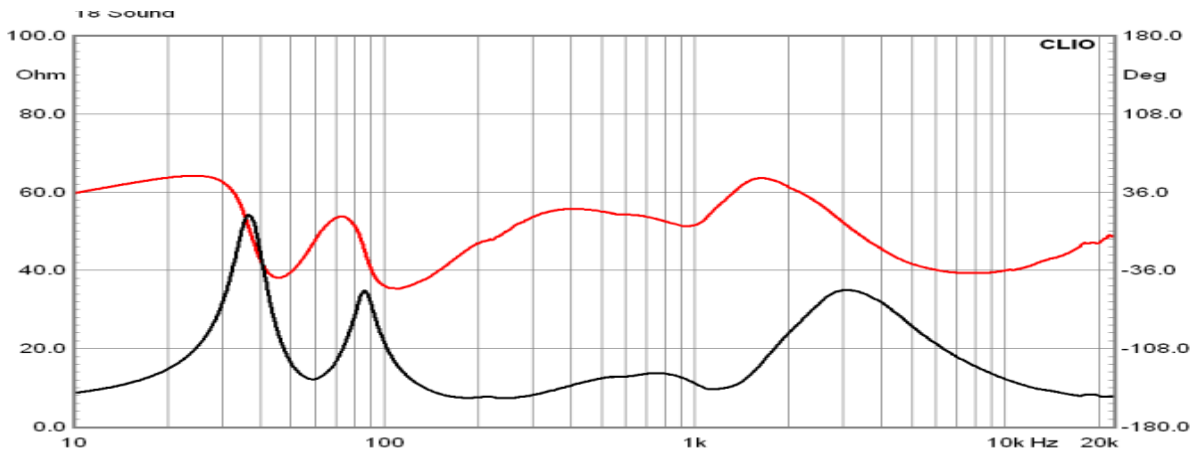
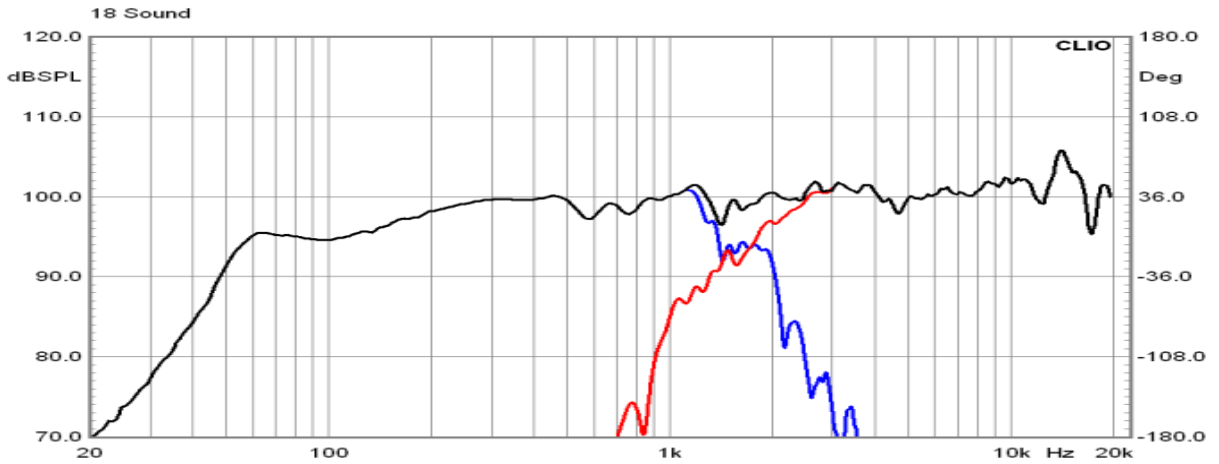


■ Horizontal ▲ Vertical

Directivity Index

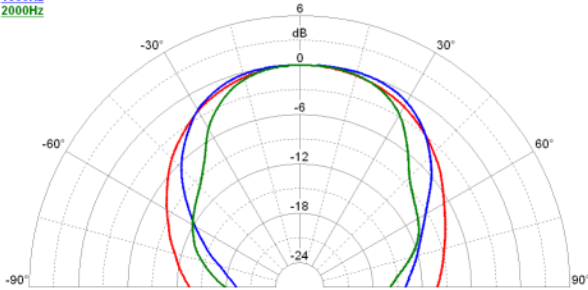


Measurements: 12ND830 + ND1090/XT1086

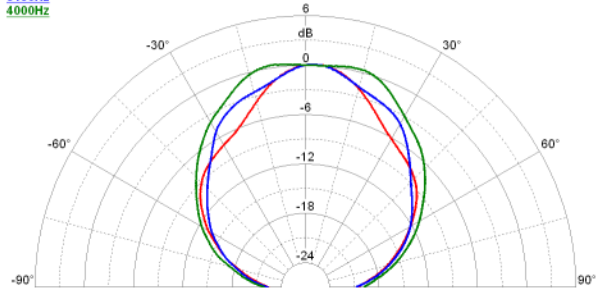


Horizontal polar response

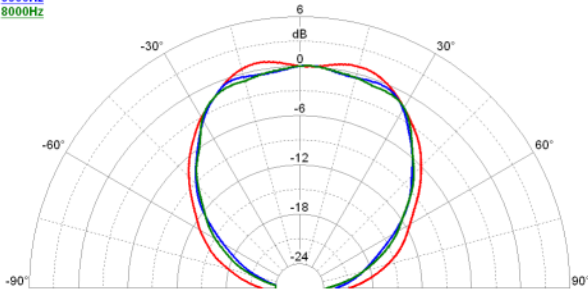
1250Hz
1600Hz
2000Hz



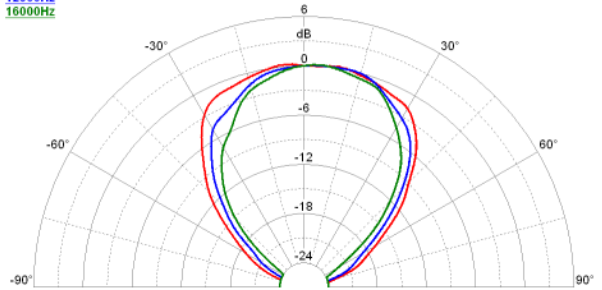
2500Hz
3150Hz
4000Hz



5000Hz
6300Hz
8000Hz

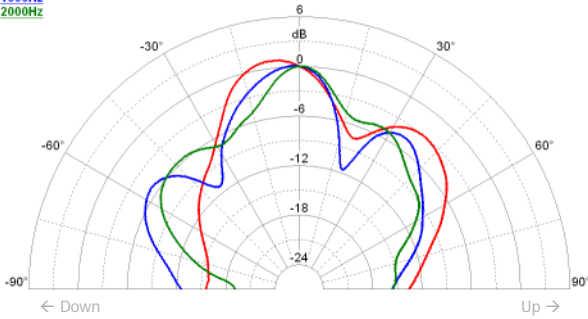


10000Hz
12500Hz
16000Hz

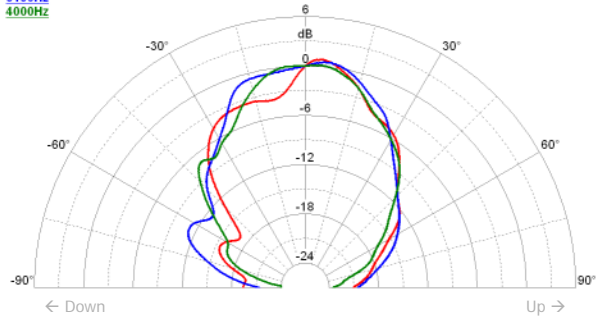


Vertical polar response

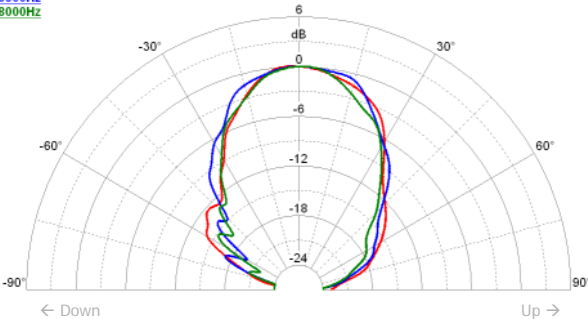
1250Hz
1600Hz
2000Hz



2500Hz
3150Hz
4000Hz



5000Hz
6300Hz
8000Hz



10000Hz
12500Hz
16000Hz

