APPLICATION NOTE

HIGH PERFORMANCE 2 WAY, 12’’ LOUDSPEAKER SYSTEM

1” Driver version
With passive crossover

1.4” Driver version
Biamped

KEY FEATURES (1” driver version)

- An effective, high performance and easy to build two way loudspeaker system for high performance in a very compact and portable enclosure.
- Cost effective solution with high quality ceramic magnet components
- An “already optimized” passive crossover network greatly simplifies the system setup.

12W750

General Specifications

Nominal Diameter	300 mm (12 in)
Rated Impedance	8 Ohm
AES Power	600 W
Program Power	1200 W
Peak Power	2500 W
Sensitivity	97 dB
Frequency Range	50 ÷ 4600 Hz
Power Compression @-10dB	0,9 dB
Power Compression @-3dB	2,8 dB
Power Compression @Full Power	3,8 dB
Max Recomm. Frequency	1800 Hz
Recomm. Enclosure Volume	40 ÷ 90 lt. (1,41 ÷ 3,18 cuft)
Minimum Impedance	6,4 Ohm at 25°C
Max Peak To Peak Excursion	38 mm (1,50 in)
Voice Coil Diameter	75 mm (3 in)
Voice Coil Winding Material	aluminum
Suspension	Triple Roll, Polycotton
Cone	Curvilinear, water repellent high damping pulp

Thiele Small Parameters

Fs	49 Hz
Re	5,2 Ohm
Sd	0,0531 sq.mt. (82,31 sq.in.)
Qms	7,00
Qes	0,30
Qts	0,28
Vas	73 lt. (2,58 cuft)
Mms	57 gr. (0,13 lb)
BL	18 Tm
Linear Mathematical Xmax	± 8 mm (± 0,31 in)
Le (1kHz)	0,95 mH
Ref. Efficiency 1W@1m (half space)	96,6 dB

HD1050

General Specifications

Throat Diameter	25,4 mm (1 in)
Rated Impedance	8 Ohm
DC Resistance	5,3 Ohm
Minimum Impedance	7 Ohm at 4000Hz
AES Power	50 W above 1,6 kHz
Program Power	100 W above 1,6 kHz
Sensitivity	107 dB
Frequency Range	1600Hz ÷ 20kHz
Recomm. Xover Frequency	1400Hz (12dB/oct slope)
Diaphragm Material	Titanium - PEN
Voice Coil Diameter	44,4 mm (1 3/4 in)
Voice Coil Winding Material	Edge-wound aluminum
Magnet Material	Ferrite
Flux Density	1,6 T
BL Factor	7,4 N/A
Polarity	Positive voltage on + terminal gives positive pressure in the throat

XT1086

General Specifications

Throat Diameter	25,4 mm (1 in)
Horizontal Coverage -6db	80°(1 - -8) average range(1,6kHz - 12,5kHz) (1 in)
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. Xover Frequency	1200 Hz or more
Sensitivity	110 dB
Frequency Range	1200 Hz - 20kHz
Material	Die-cast aluminum

KEY FEATURES (1.4” driver version)

- Super lightweight overall construction
- Biamp operation for maximum performances
- Dual gap woofer technology and state of the art high frequency driver

12NTLW2500

ND2T

PR614

IMPORTANT NOTE!

Due to its small diameter, the Nd2 has non-standard holes on a 76mm diameter. Such holes have to be carefully drilled on the horn to properly mount the driver on it.

SPECIFICATIONS

Nominal Impedance	8 Ω
Minimum Impedance	5.5 Ω
Nominal Power Handling[1]	500 W
Continuous Power Handling[2]	1000 W
Sensitivity[3]	98.5 dB
Frequency Range	55 - 4500 Hz
Voice Coil Diameter	64 mm (2.5 in)
Winding Depth	19.7 mm (0.78 in)
Magnetic Gap Depth	9.0 mm (0.35 in)

PARAMETERS[4]

Resonance Frequency	60 Hz
Re	5.0 Ω
Qes	0.39
Qms	8.4
Qts	0.38
Vas	45.0 dm^3 (1.59 ft^3)
Sd	531.0 cm^2 (82.31 in^2)
η_0	2.4 %
Xmax	7.6 mm
Xvar	8.0 mm
Mms	62.0 g
Bl	17.4 Txm
Le	0.44 mH
EBP	153 Hz

SPECIFICATIONS[1]

Throat Diameter	36 mm (1.4 in)
Nominal Impedance	8 Ω
Minimum Impedance	7.9 Ω
Nominal Power Handling[2]	80 W
Continuous Power Handling[3]	160 W
Sensitivity[4]	110.0 dB
Frequency Range	0.8 - 20.0 kHz
Recommended Crossover[5]	1.2 kHz
Voice Coil Diameter	61 mm (2.4 in)
Winding Material	Aluminum
Diaphragm Material	Titanium
Flux Density	2.0 T
Magnet Material	Neodymium

MOUNTING AND SHIPPING INFO

Overall Diameter	104 mm (4.09 in)
Depth	76 mm (2.99 in)
Net Weight	1.5 kg (lb)
Shipping Box	165 x 165 x 150 mm (6.50x6.50x5.91 in)

General Specifications

Throat Diameter	35,5 mm (1,4 in)
Horizontal Coverage -6db	60° (10 - -2) average range (1,25kHz - 12,5kHz)
Vertical Coverage -6db	40° (25 - 0) average range (1,25kHz - 12,5kHz)
Directivity Index	11 dB (2 - -1) average range (1,25kHz - 12,5kHz)
Usable Frequency Range	Above 800 Hz
Recomm. Xover Frequency	800 Hz or more
Sensitivity	110 dB
Frequency Range	800 Hz - 18KHz

KEY FEATURES

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

> The vents can be made with standard PVC plumbing pipe connection with internal diameter of 74mm;

> M5 T-Nuts in conjunction with M5x35mm Bolts is recommended;

➢ Handling, rigging and connectors are user's choice;

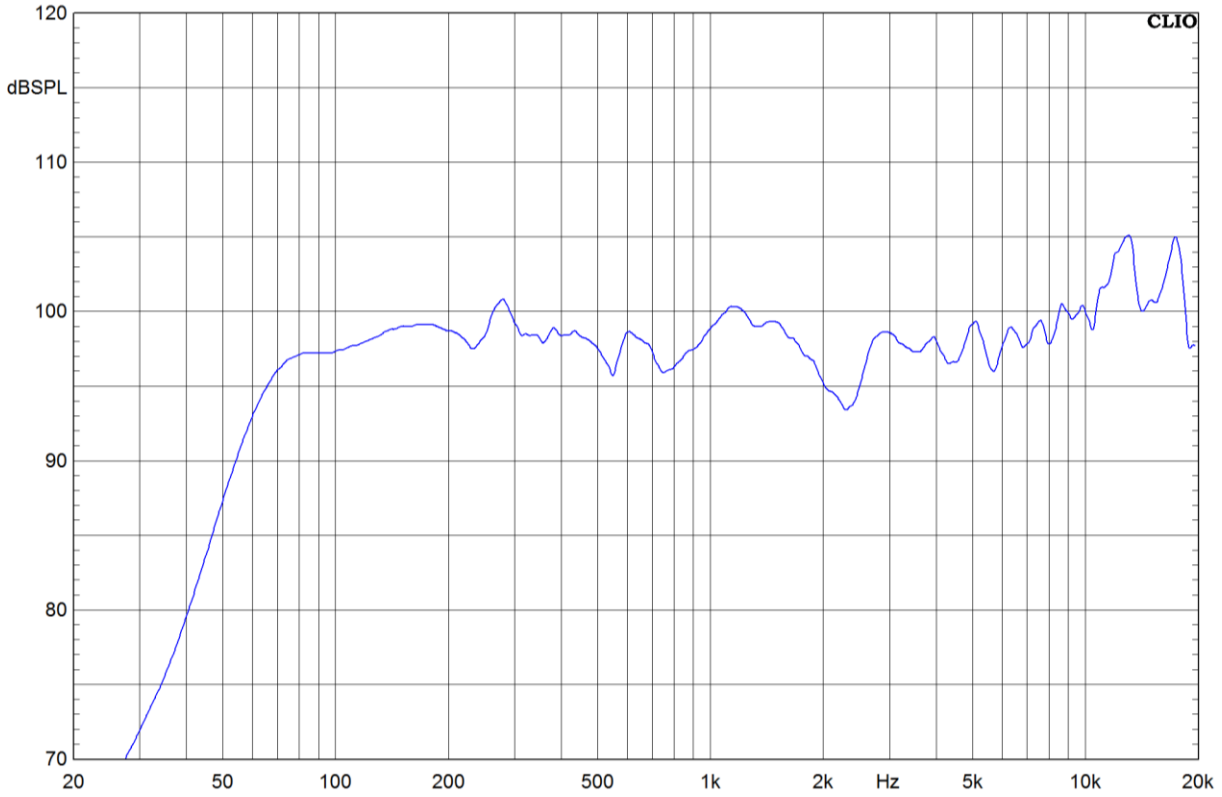
> It's recommended to well damping the cabinet as show in the example;

> An high density dampening material, such as Dacron or other synthetic fibers, is required for best acoustic performance;

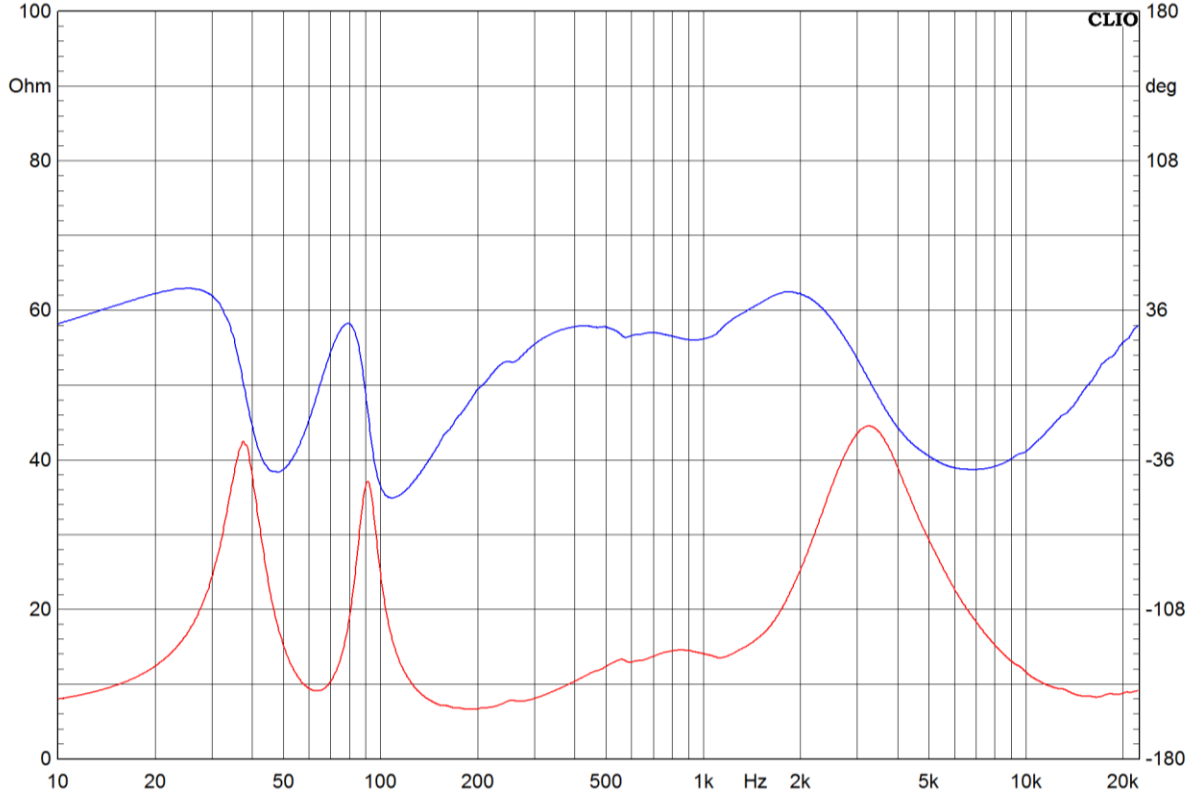
INTERNAL VIEW

DAMPING DISPOSITION

MEASUREMENTS: 12W750 + HD1050 ON XT1086 (with passive crossover)



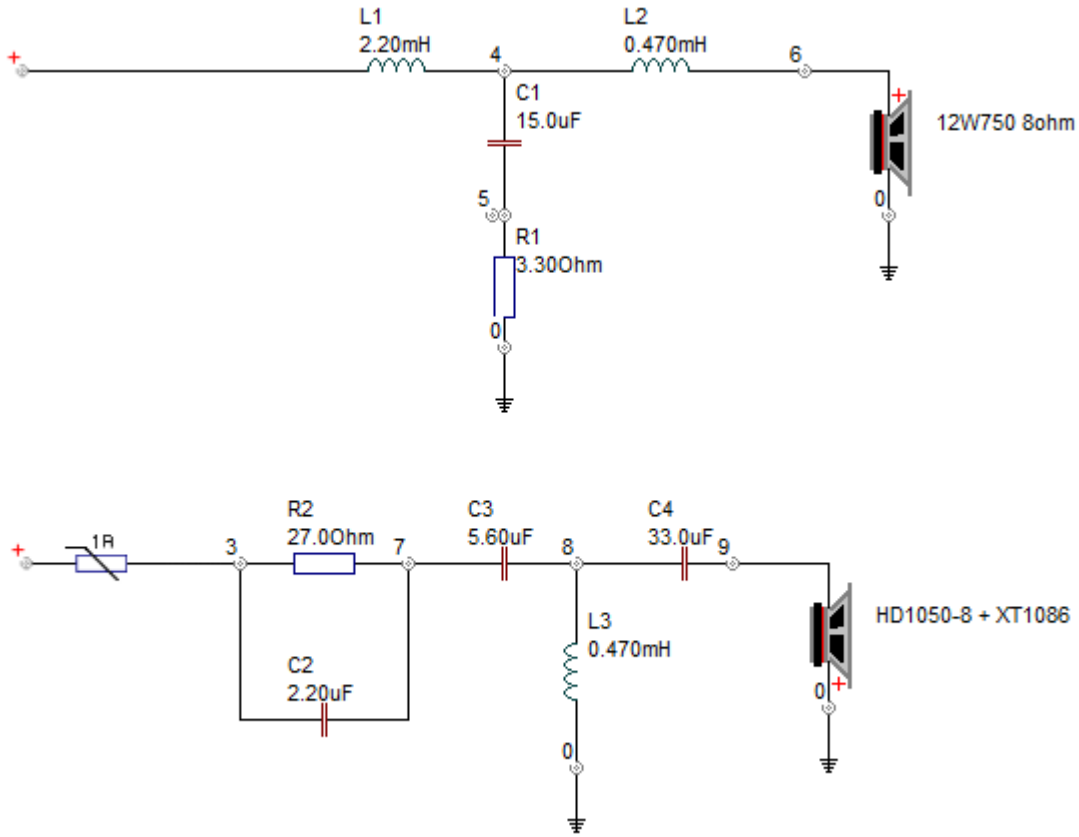
MAGNITUDE RESPONSE



PHASE RESPONSE
AND OVERALL IMPEDANCE

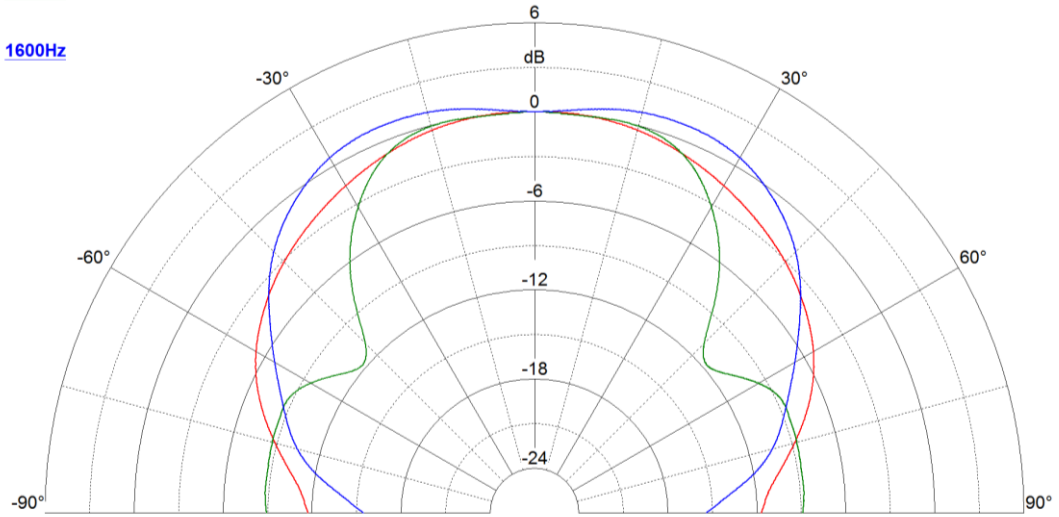
CROSSOVER SCHEMATICS: 12W750 + HD1050 ON XT1086

TYPE	VALUE	NOTE
L1 – Inductor	2.2 mH	
C1 – Capacitor	15 uF	5% - >250V
L2 – Inductor	0.47 mH	
R1 – Resistor	3.30 Ohm	>20W
R2 – Resistor	27 Ohm	>20W
C2 – Capacitor	2.2 uF	5% - >250V
C3 – Capacitor	5.6 uF	5% - >250V
L3 – Inductor	0.47 mH	
C4 – Capacitor	33 uF	5% - >250
PTC	1A	

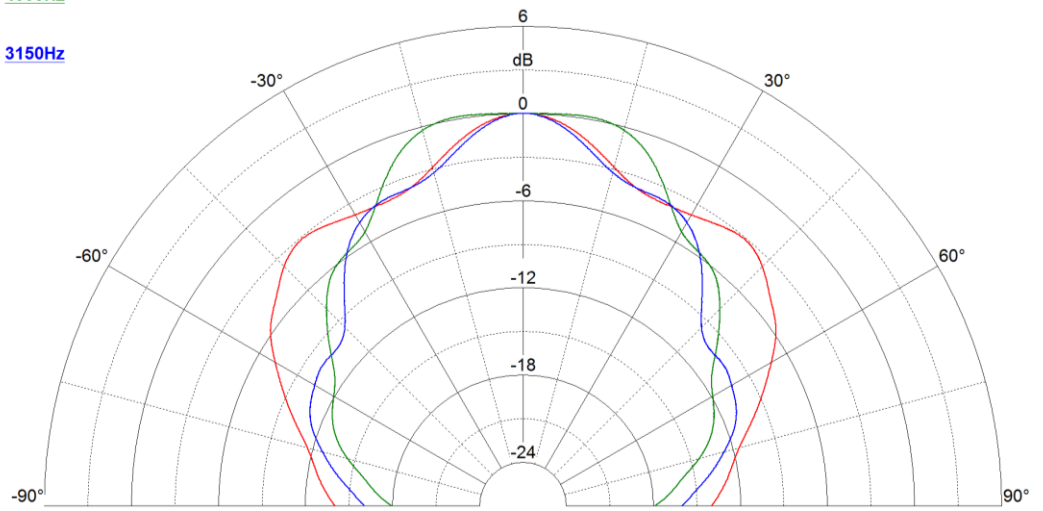


HORIZONTAL POLAR RESPONSE:
12W750 + HD1050 ON XT1086 (with passive crossover)

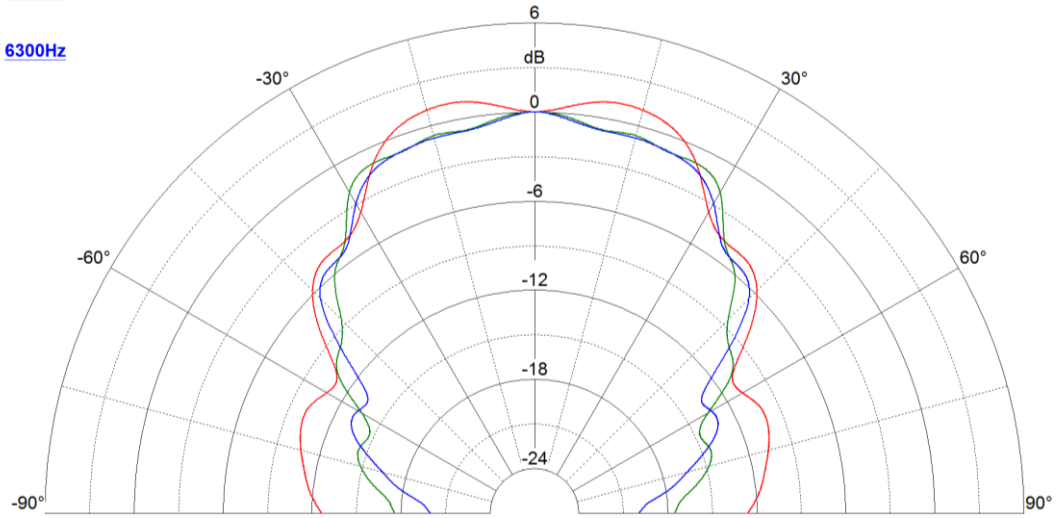
1250Hz
2000Hz
1600Hz



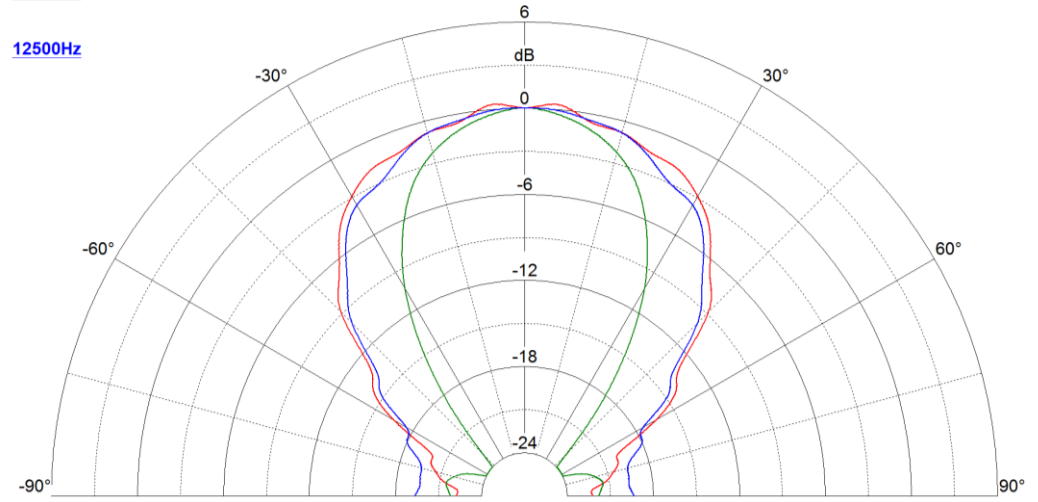
2500Hz
4000Hz
3150Hz



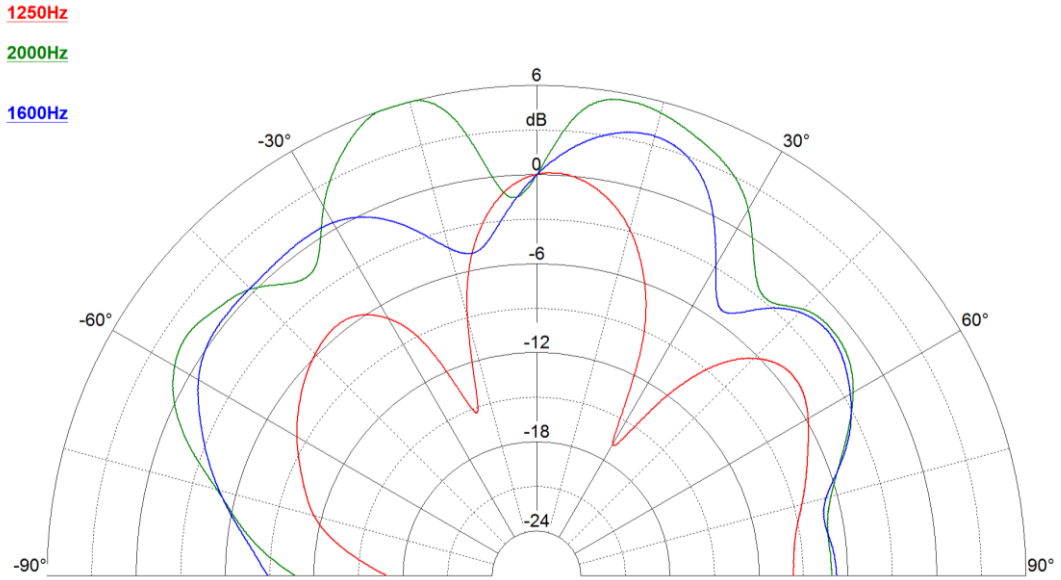
5000Hz
8000Hz
6300Hz

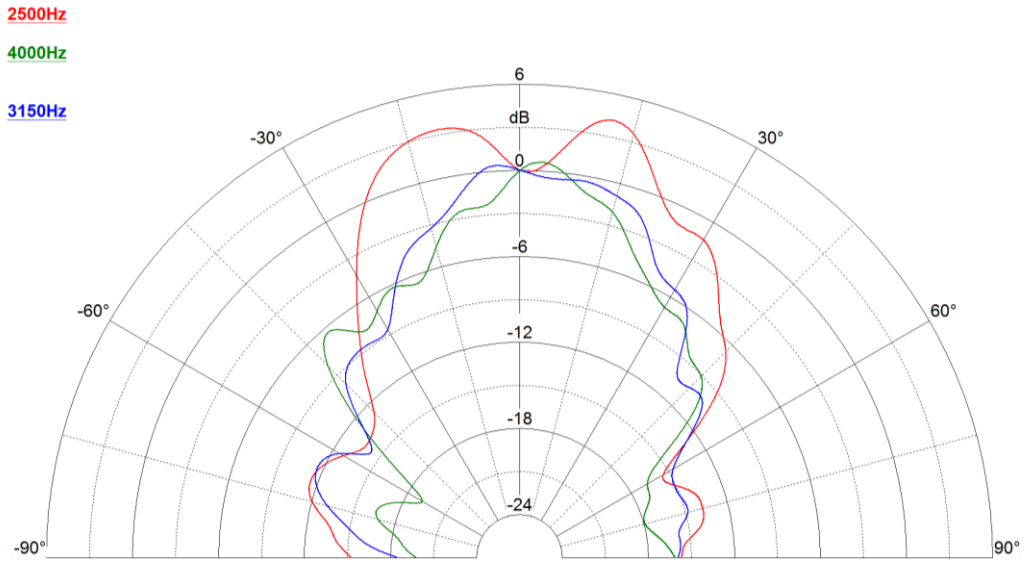


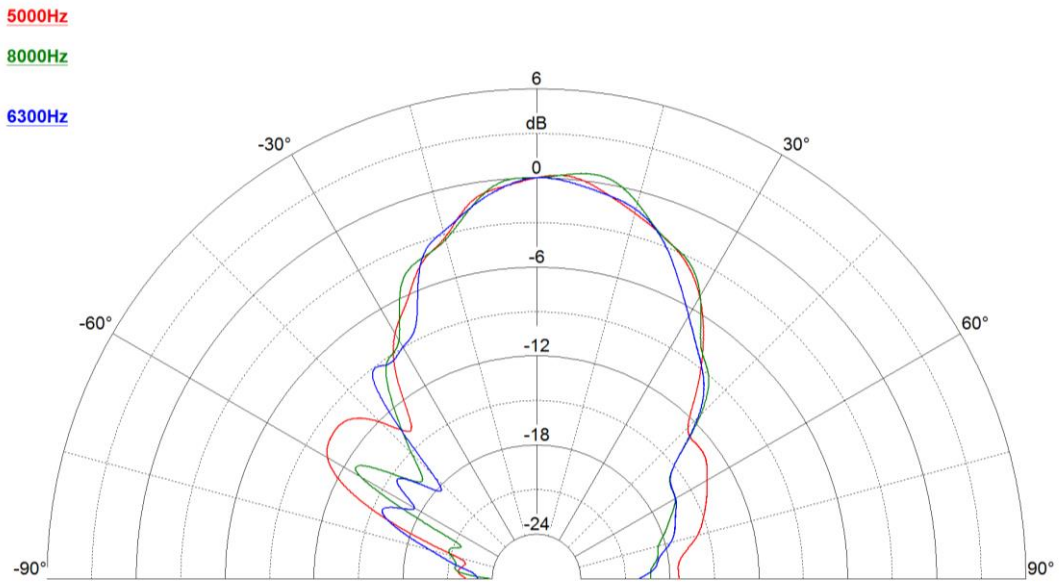
10000Hz
16000Hz
12500Hz

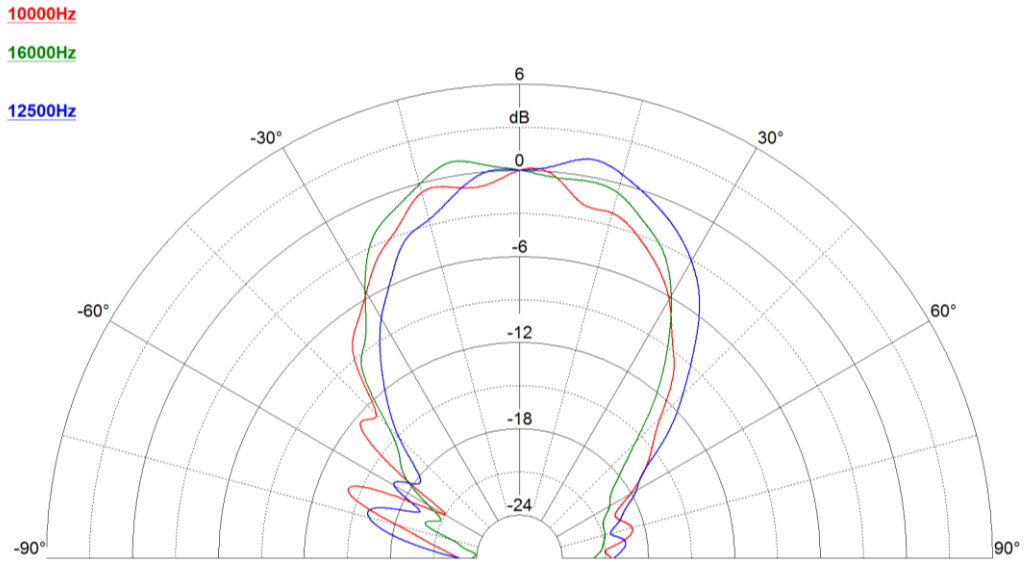


VERTICAL POLAR RESPONSE:
12W750 + HD1050 ON XT1086 (with passive crossover)

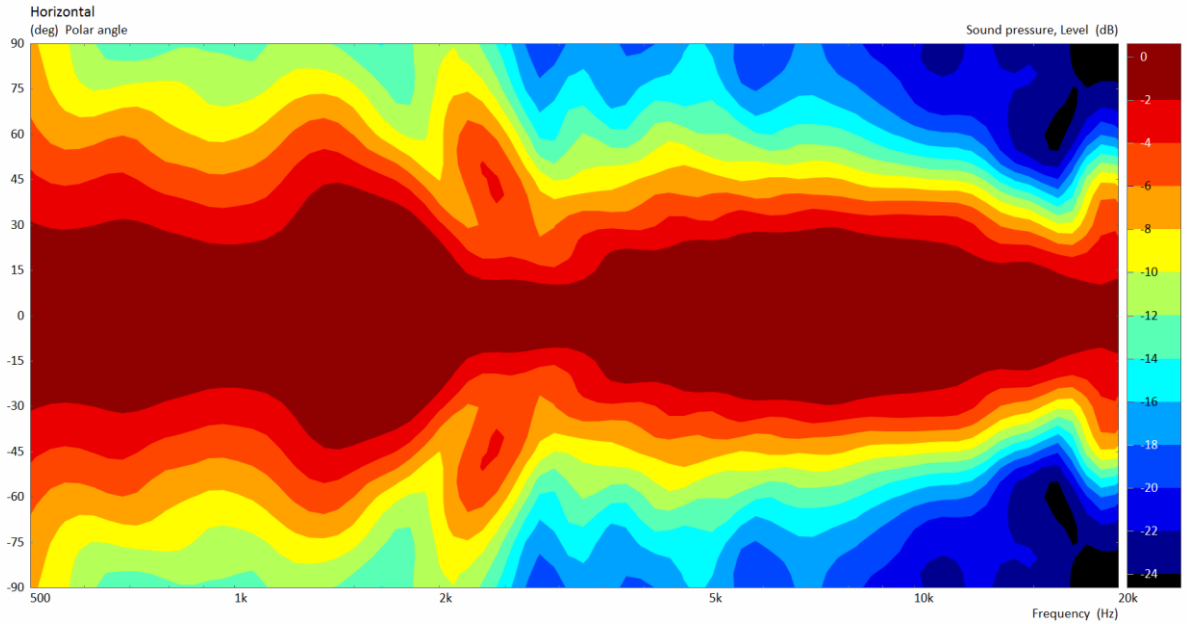






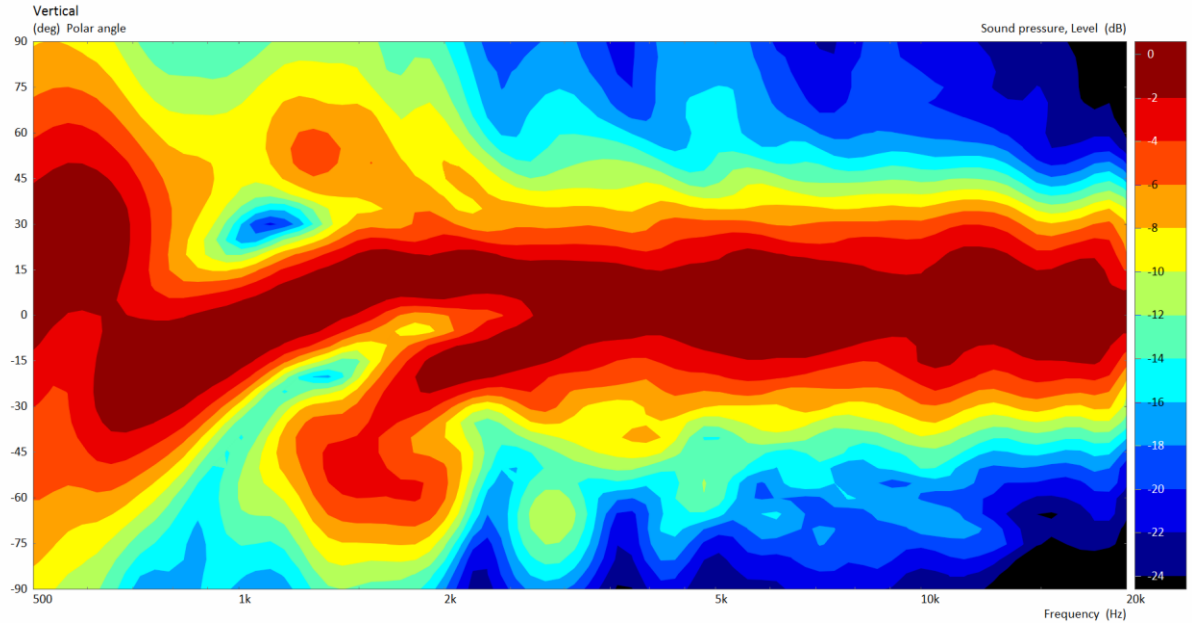


POLAR MAPS: 12W750 + HD1050 ON XT1086 (with passive crossover)



HORIZONTAL POLAR MAP

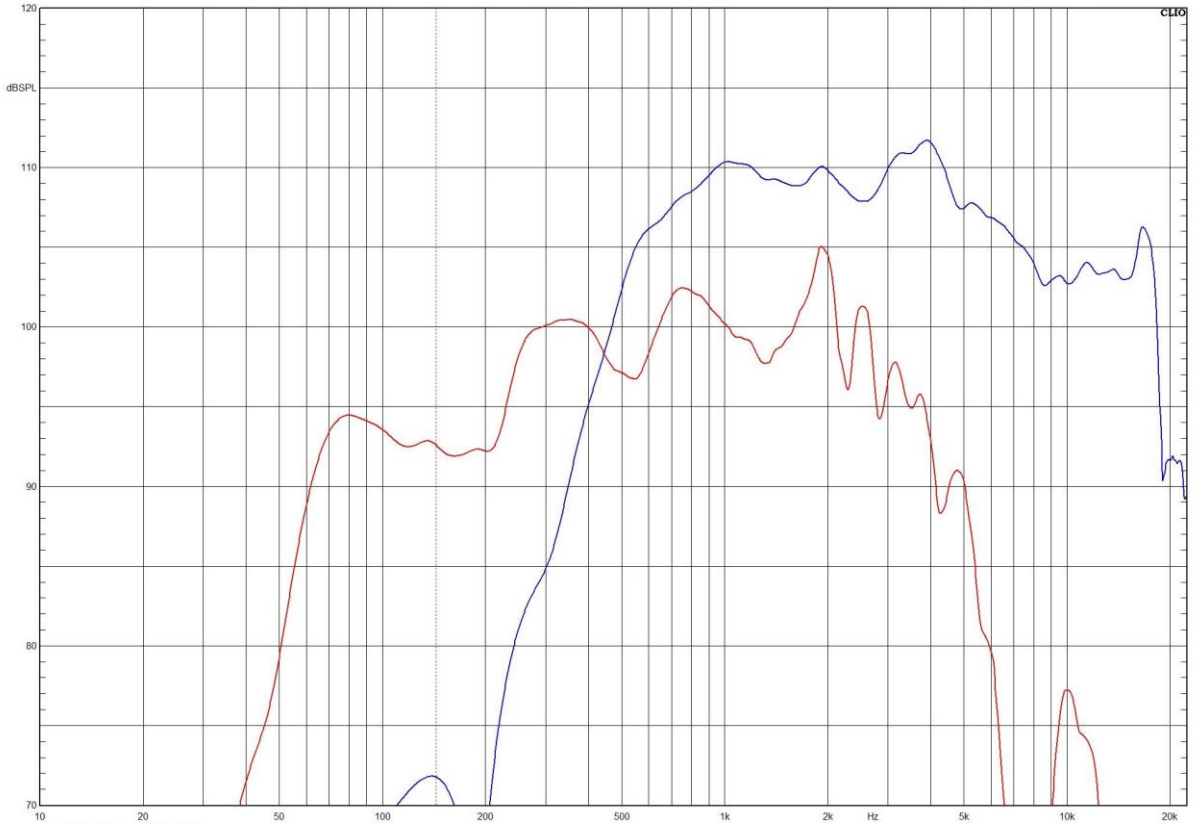
Normalized to 0deg Axis – 1/3 Smoothing



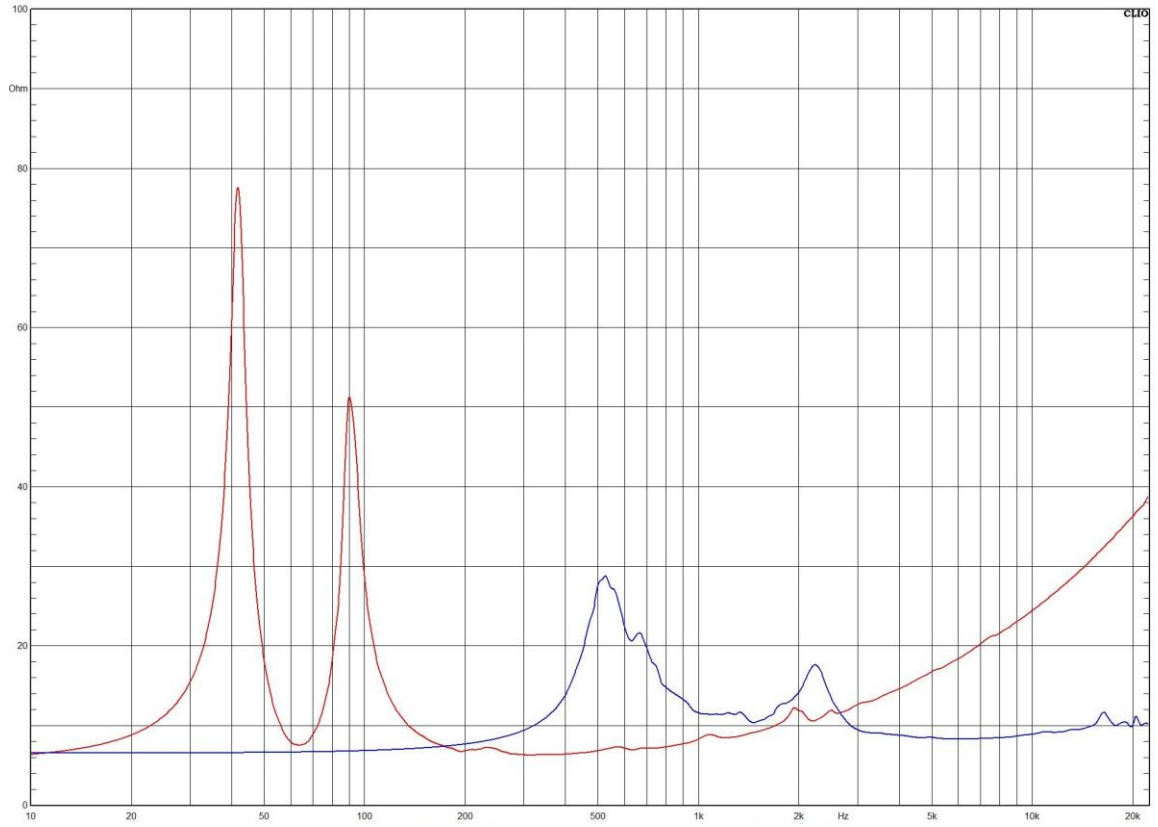
VERTICAL POLAR MAP

Normalized to 0deg Axis – 1/3 Smoothing

MEASUREMENTS: 12NTLW2500 + ND2T ON PR614 (unfiltered)

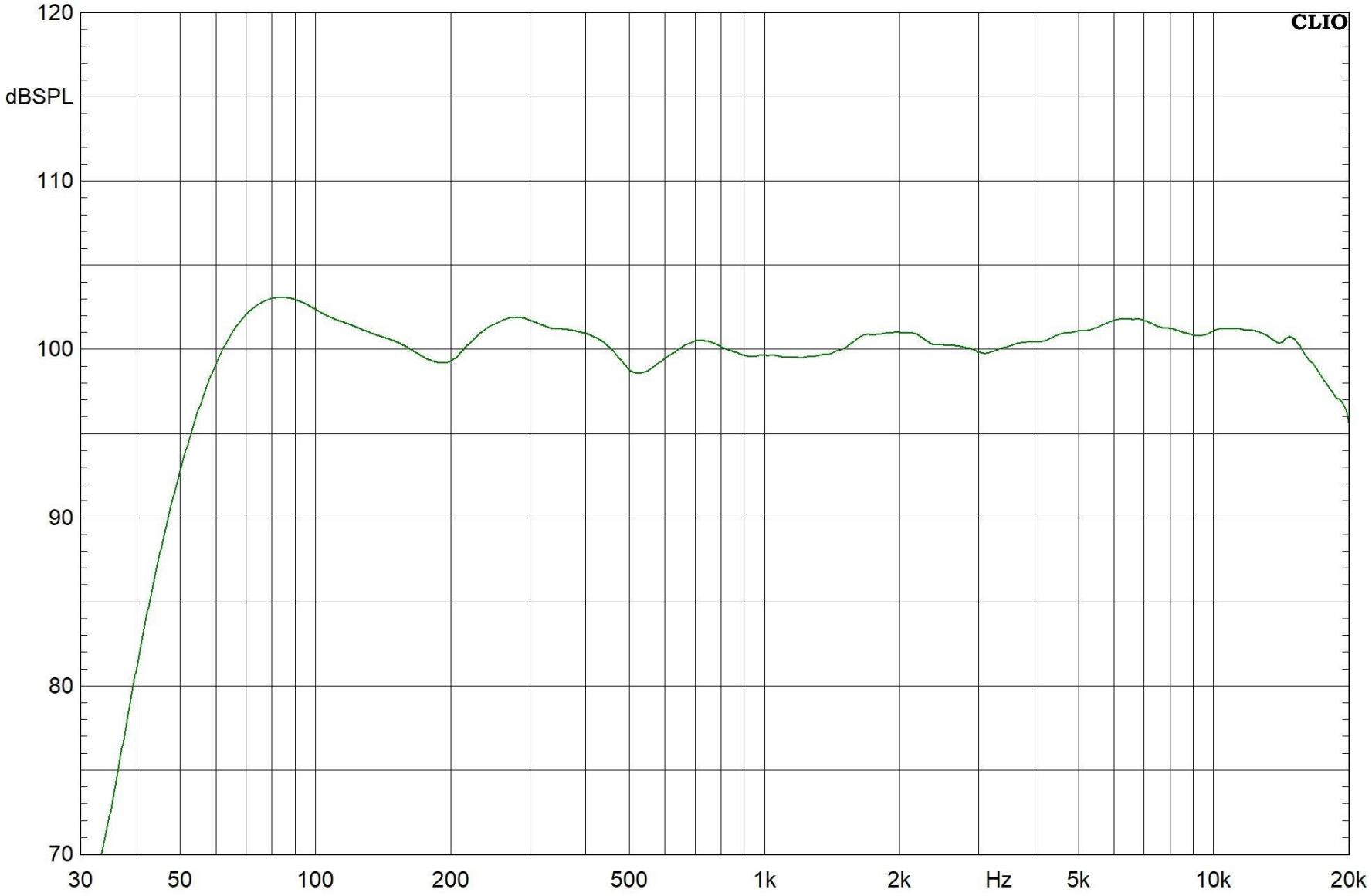


MAGNITUDE RESPONSE



IMPEDANCE RESPONSE

MEASUREMENTS: 12NTLW2500 + ND2T ON PR614 (with preset)



MAGNITUDE RESPONSE WITH PRESET
(-20dBU input @ 1 meter, on axis)

LOW Frequency

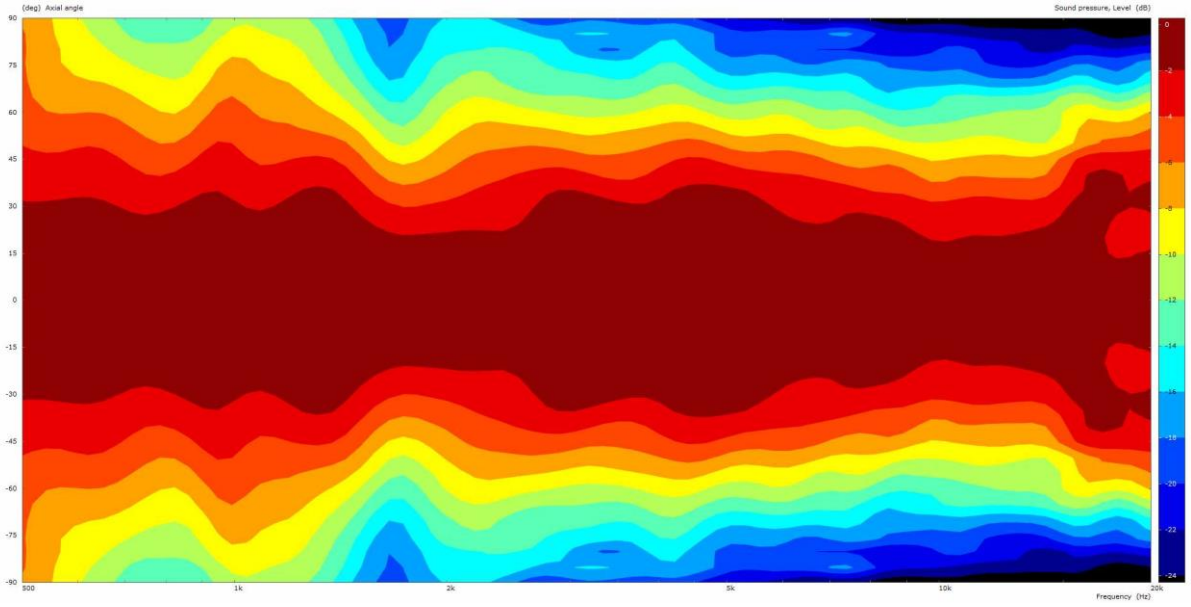
Highpass:45hz BW 24dB
Low shelf 250hz Q:4 Gain:9dB
Bell: 55hz Q:3 Gain:3dB
Bell: 170hz Q:1 Gain:3dB
Bell: 320hz Q:4 Gain:-5dB
Bell: 800hz Q:4 Gain:-4dB
Bell: 1300hz Q2: Gain:2dB
Bell: 2000hz Q:3 Gain:-4dB
Low pass: 1500hz BW24
Delay: 0,45ms

Limiters:
60V RMS - Attck 2sec -Rel4 sec
120V Peak - Attck10ms - Rel 160msec
140 Clip

HIGH Frequency
HighPass:1500hz BW24
Bell: 2500hz Q:4 Gain:3dB
Bell: 3600hz Q:4 Gain:-5dB
Bell: 10000hz Q:1 Gain:5dB
High shelf 5000hz: Q:6
No Delay

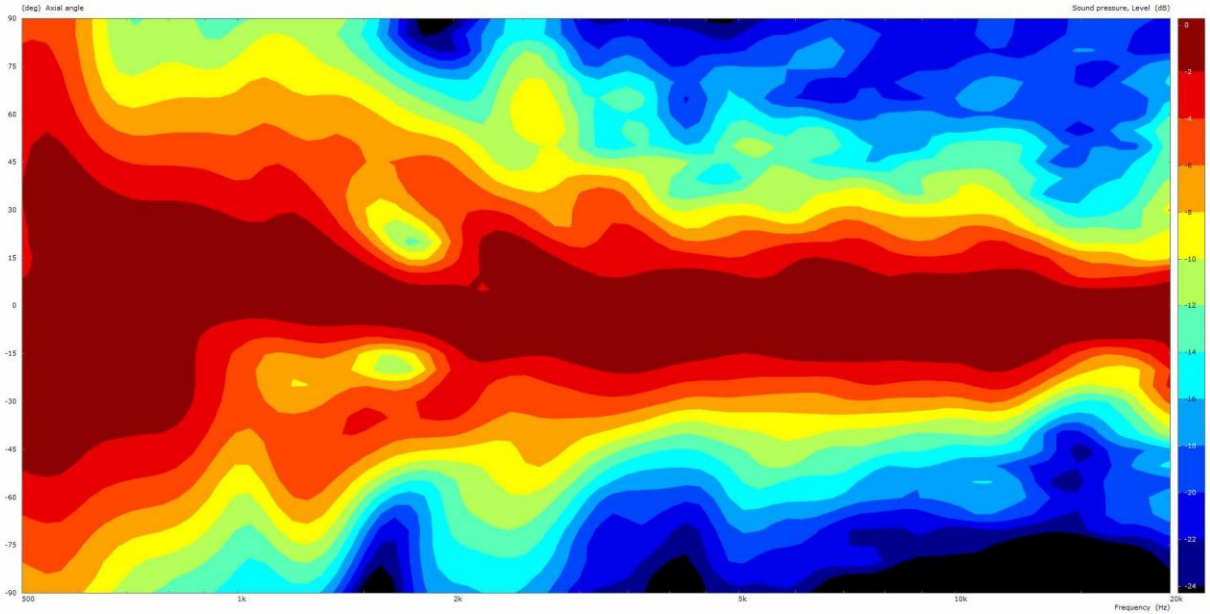
Limiters:
15V RMS - Attck 0,2 sec - Rel 0,5sec
40V Peak - Attck 1ms - Rel 16msec
55V Clip

POLAR MAPS: 12NTLW2500 + ND2 ON PR614 (with preset)



HORIZONTAL POLAR MAP

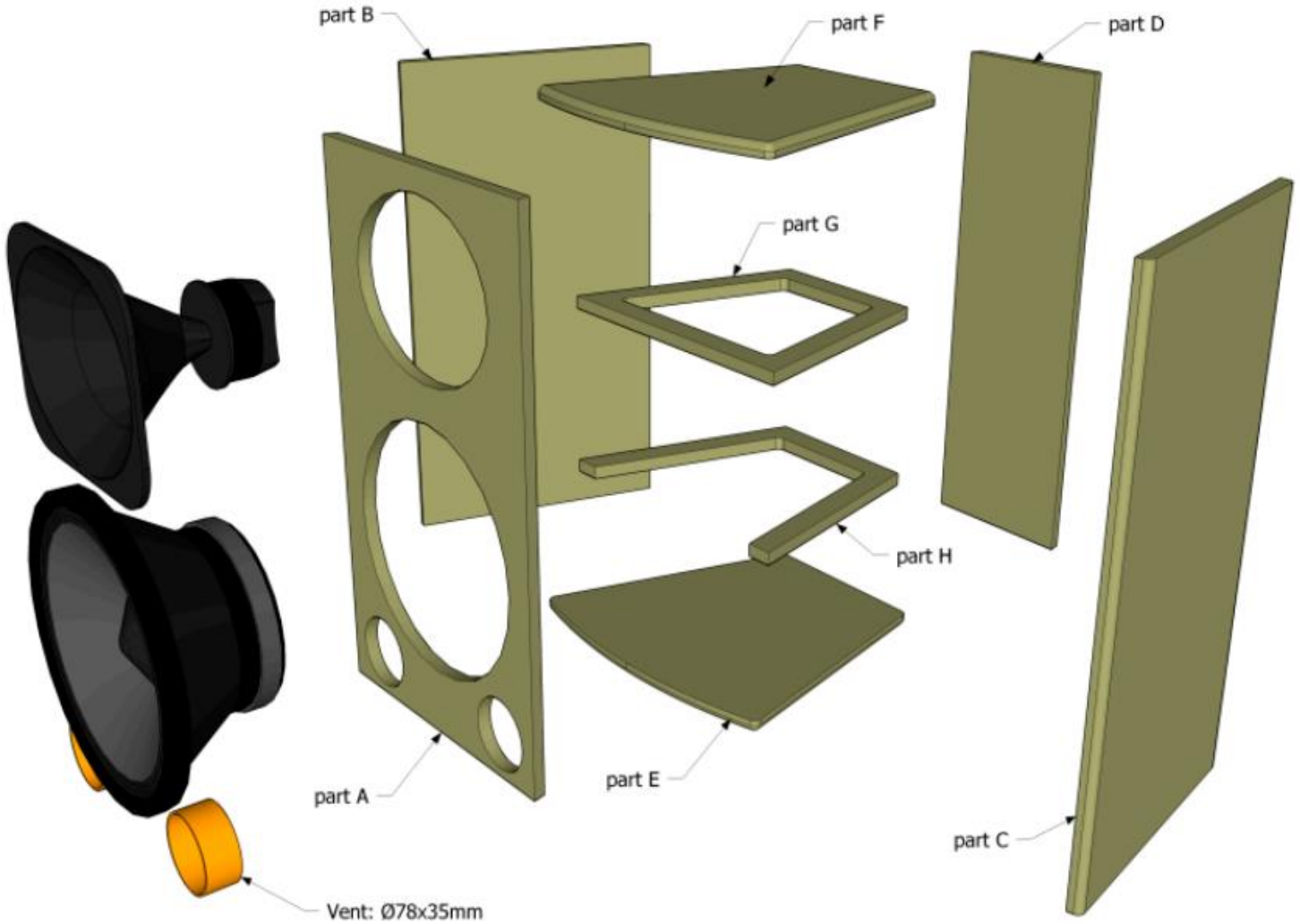
Normalized to 0deg Axis – 1/3 Smoothing



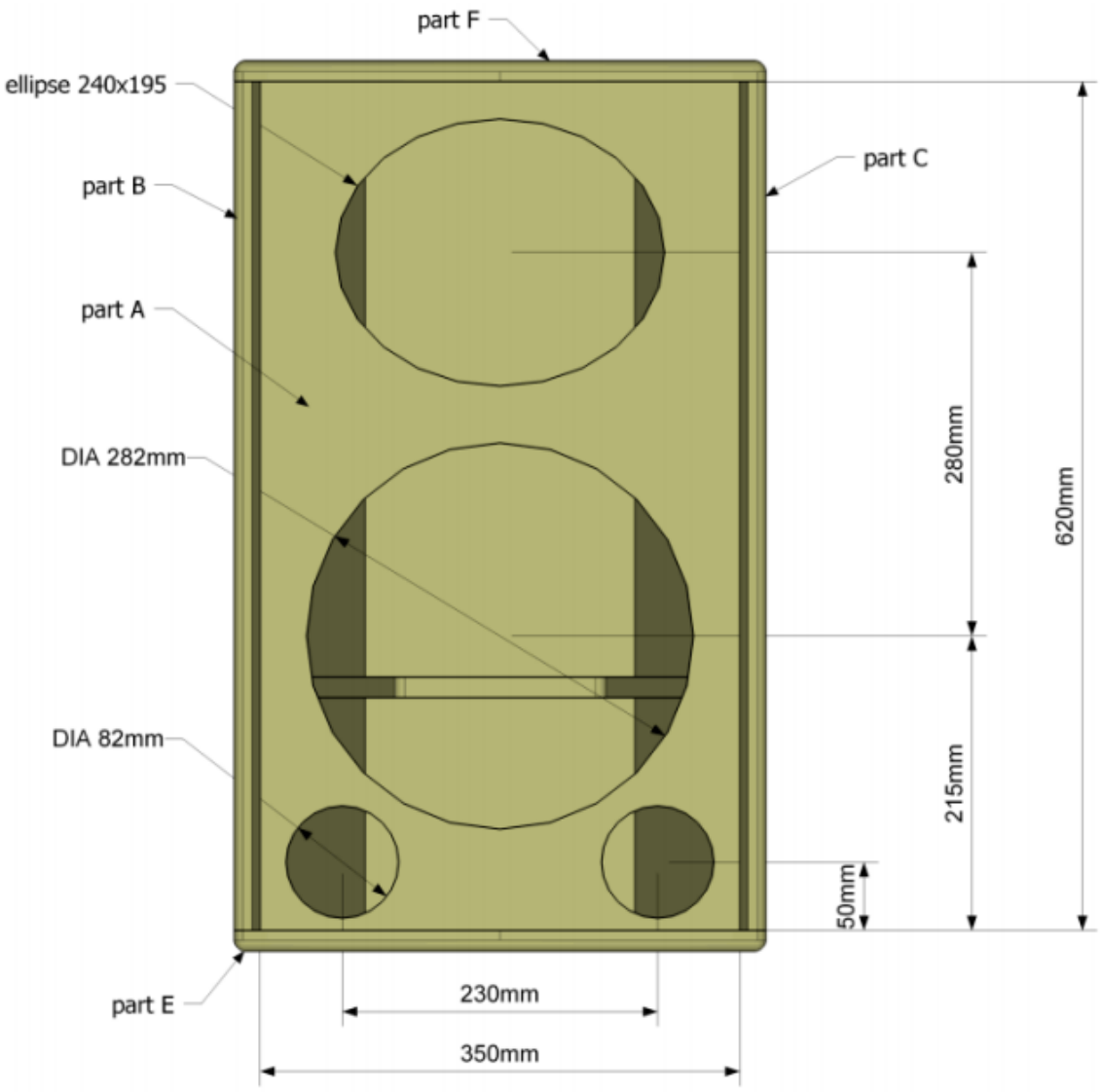
VERTICAL POLAR MAP

Normalized to 0deg Axis – 1/3 Smoothing

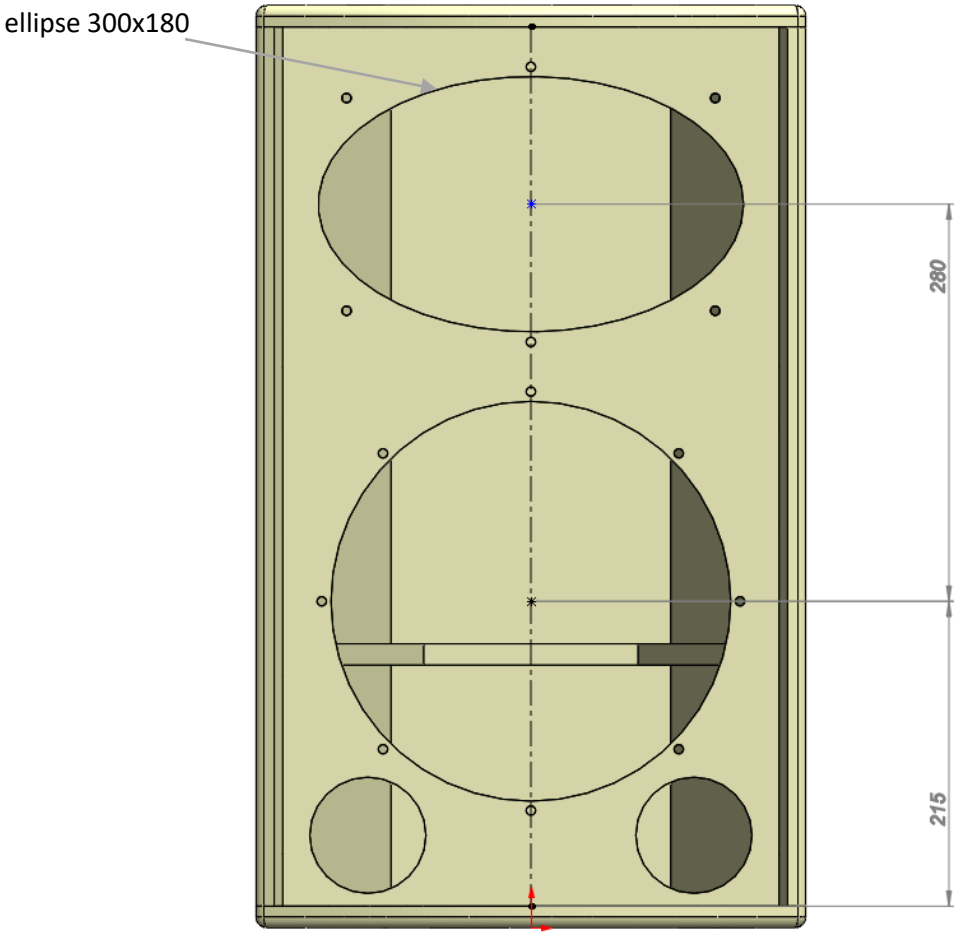
EXPLODED VIEW



FRONT VIEW

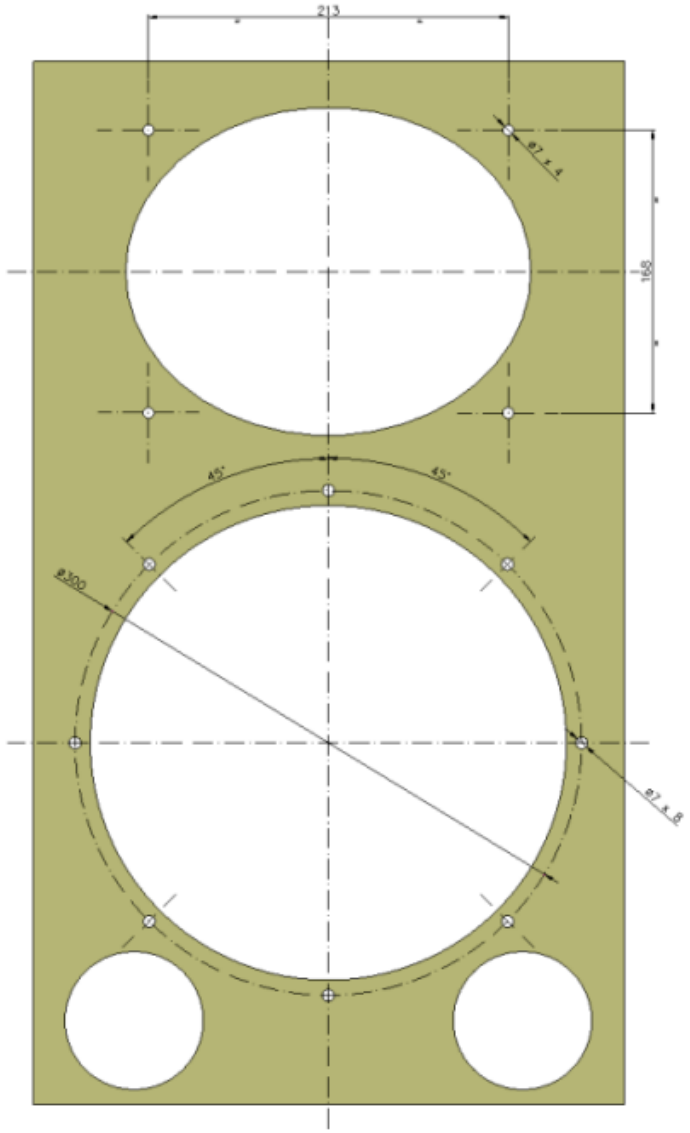


1” Driver version

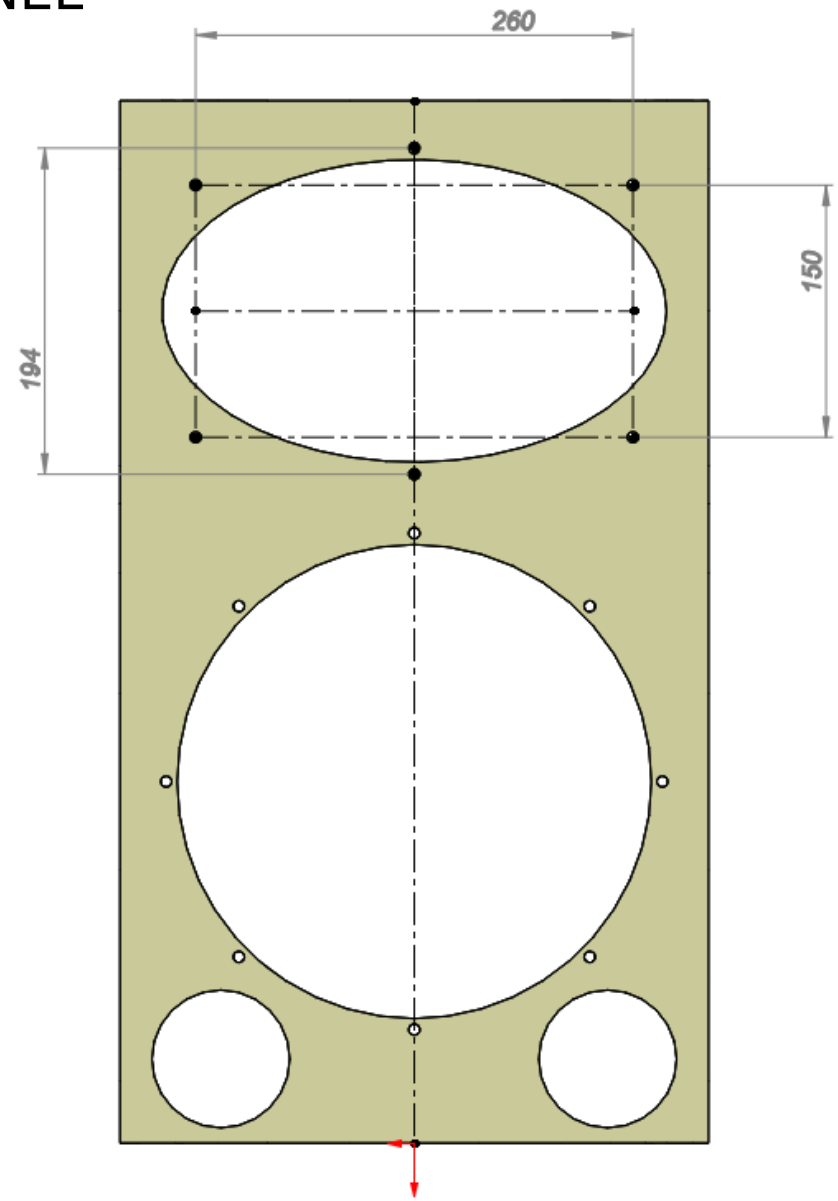


1.4” Driver version

DETAILS: FRONT PANEL

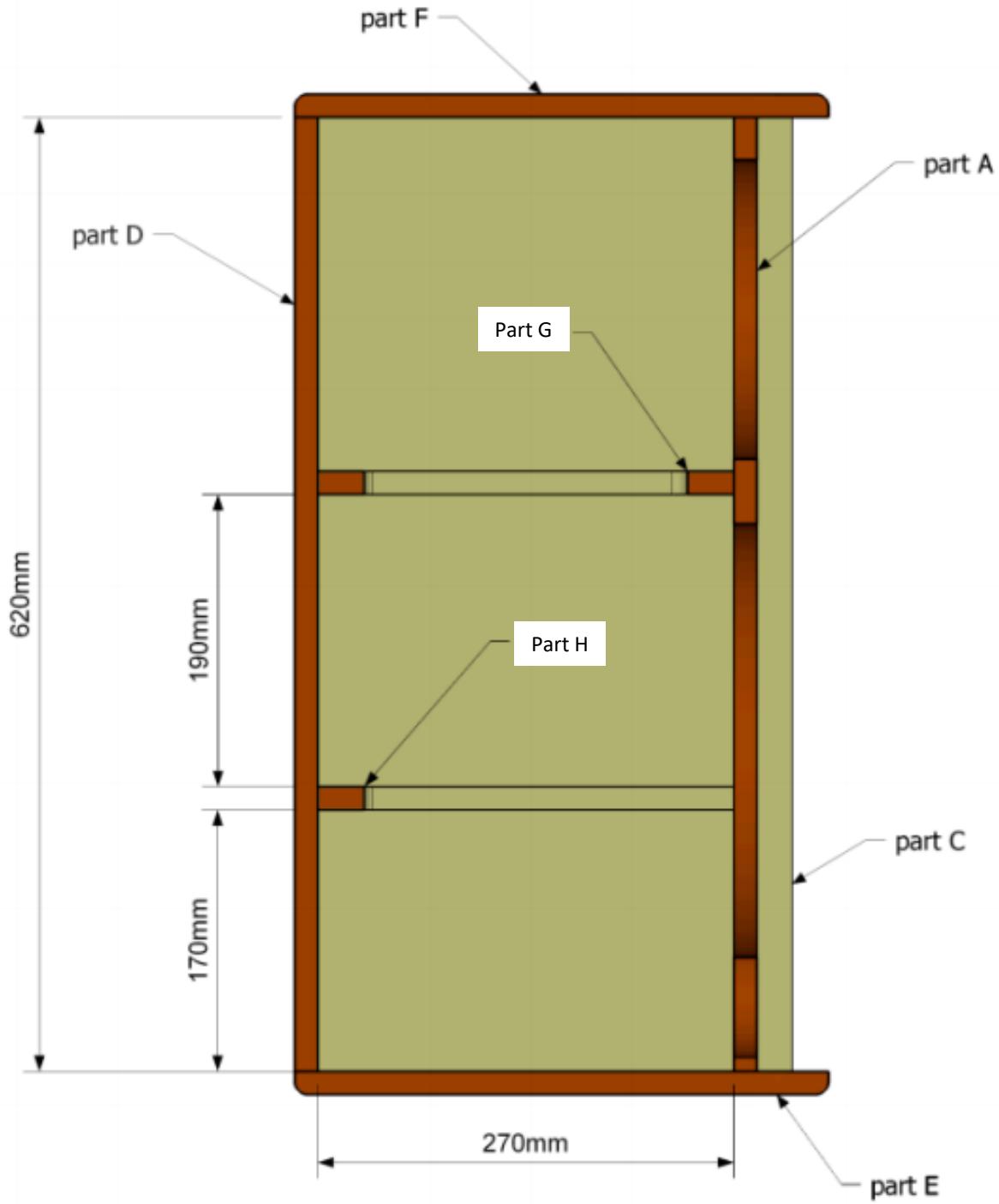


1” Driver version

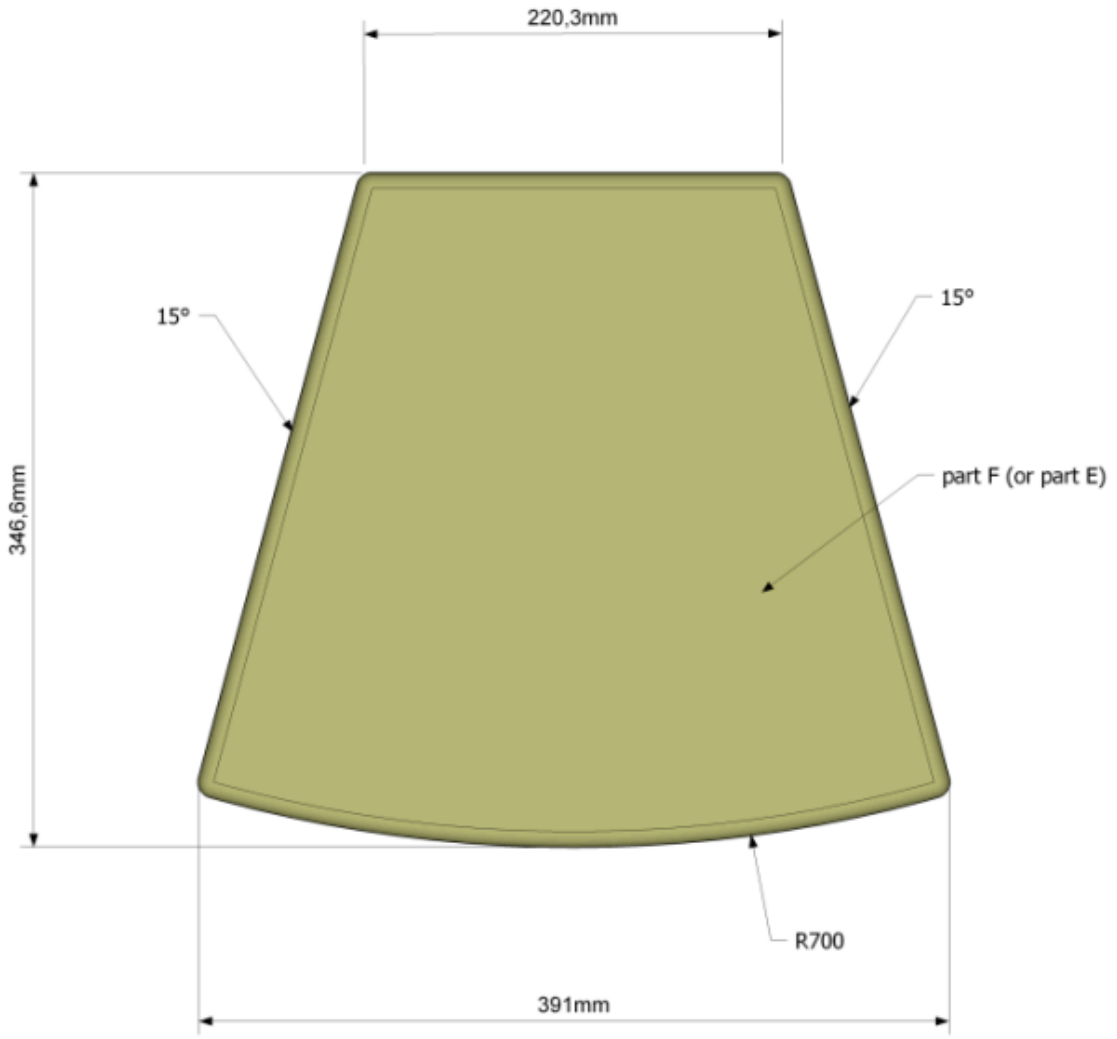


1.4” Driver version

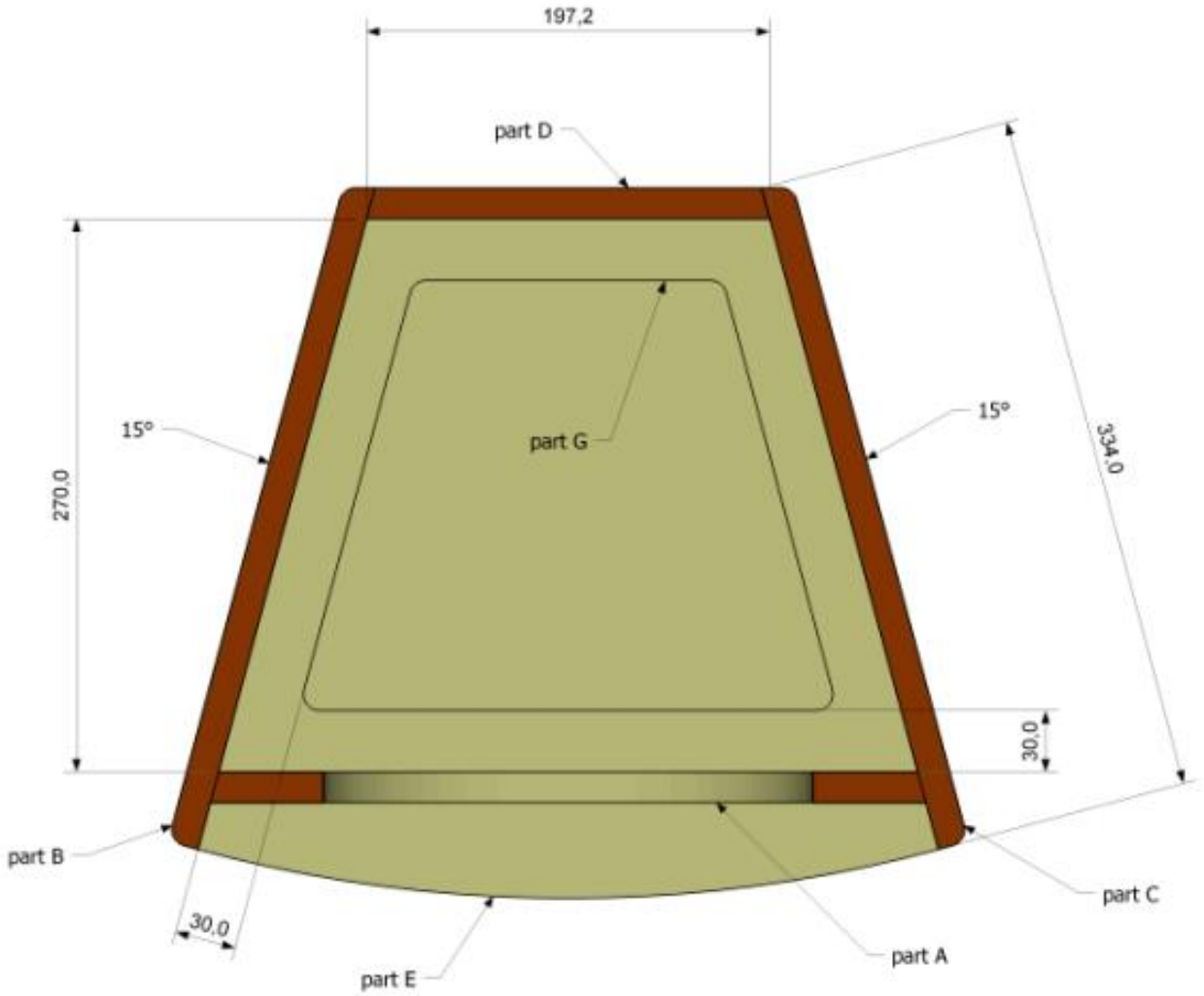
SIDE VIEW


part F
part A
part D
Part G
Part H
620mm
190mm
170mm
part C
270mm
part E

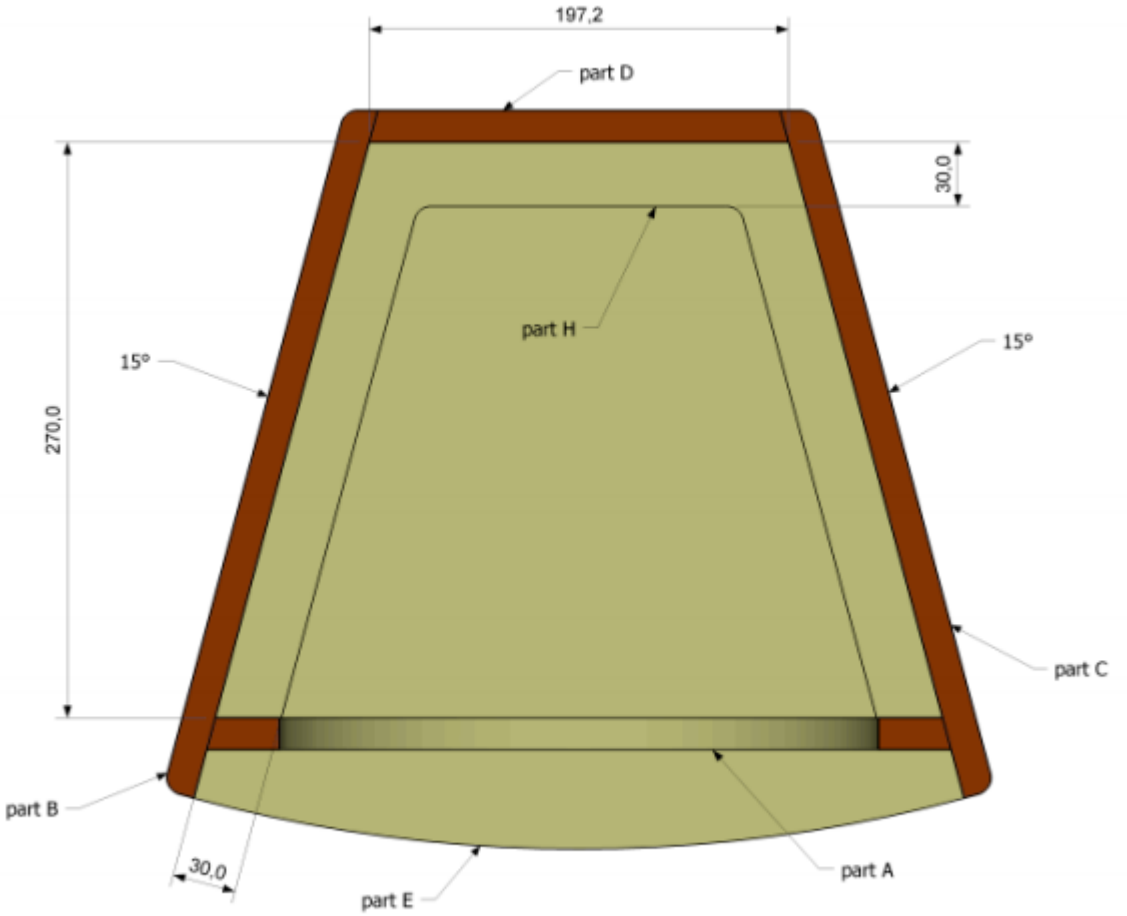
TOP VIEW



TOP SECTION: HORN



TOP SECTION: WOOFER HEIGHT



BACK VIEW