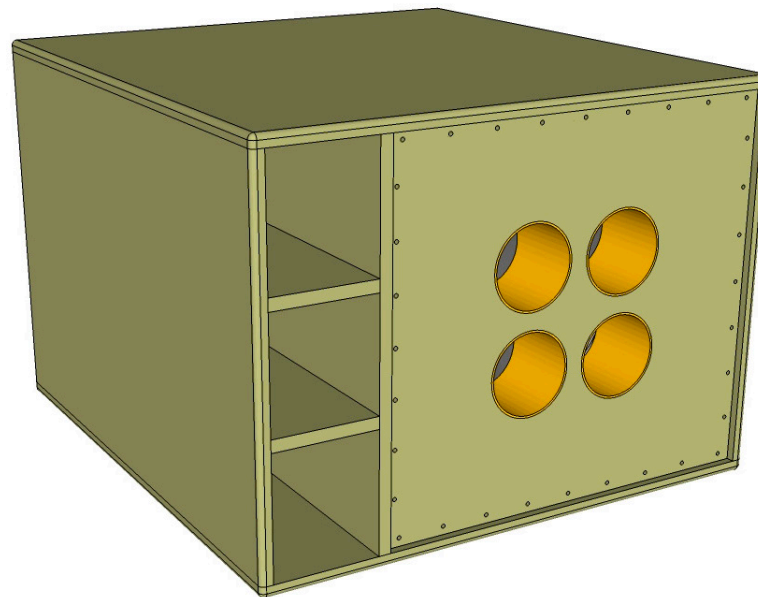




PROFESSIONAL
LOUDSPEAKERS

APPLICATION NOTE



SINGLE 21", BAND-PASS SUBWOOFER KIT

KEY FEATURES

- > High performance 21" subwoofer system.
- > Double Reflex Band-Pass design for high output, extended low frequency response
- > Over damped design for better transient response
- > Compact box dimension
- > Large vent section area for air turbulence and port compression reduction
- > Easy to build design
- > Internal bracing for cabinet loss reducing



1) 21LW1400

KEY FEATURES

4" interleaved sandwich voice coil
 High motor strength driver, ideally suited for high loading use
 800W continuous pink noise, 7000W peak power
 Reinforced paper cone for high mechanical strenght
 Double Silicon Spider
 Double Demodulating Rings

GENERAL SPECIFICATIONS

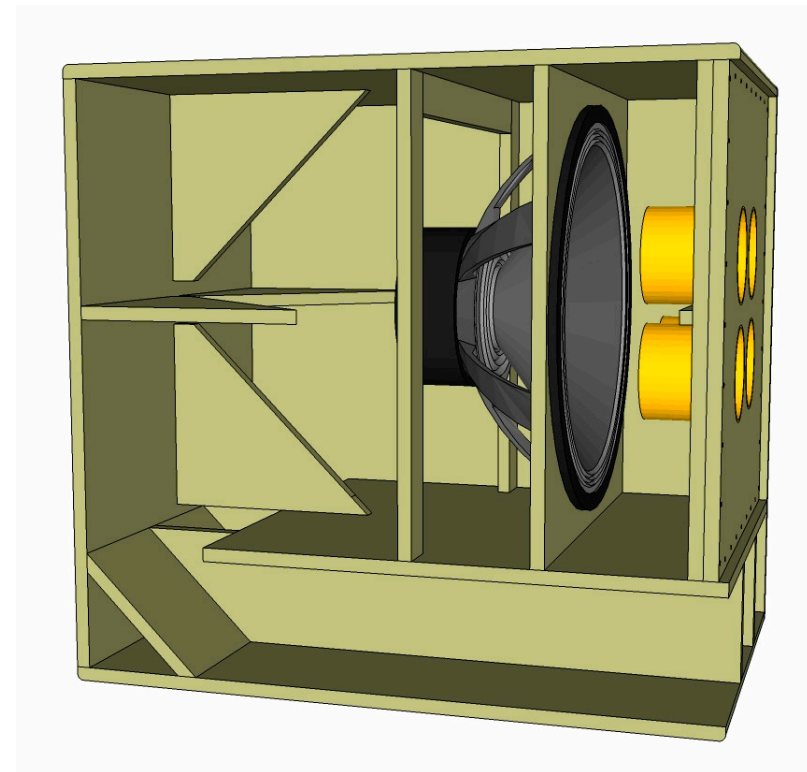
NOMINAL DIAMETER	533 MM (21 in)
RATED IMPEDANCE	8 Ohm
AES POWER	1400W
PROGRAM POWER	1600W
PEAK POWER	7000W
SENSITIVITY	99 dB
FREQUENCY RANGE	24 ÷ 2000 Hz
POWER COMPRESSION @-10dB	0.6 dB
POWER COMPRESSION @-3dB	1.5 dB
POWER COMPRESSION @0dB	2.2 dB
MAX RECOMM. FREQUENCY	250 Hz
RECOMM. ENCLOSURE VOLUME	120 ÷ 500 lt (4.24÷17.7cuft)
MINIMUM IMPEDANCE	6.4 Ohm at 25°C
MAX PEAK TO PEAK EXCURSION	52 mm (2.05 in)
VOICE COIL DIAMETER	100 mm (4 in)
VOICE COIL WINDING MATERIAL	Copper
SUSPENSION	Triple roll, Polycotton
CONE	Straight ribbed, Carbon fiber reinforced 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 gr. (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

KEY FEATURES

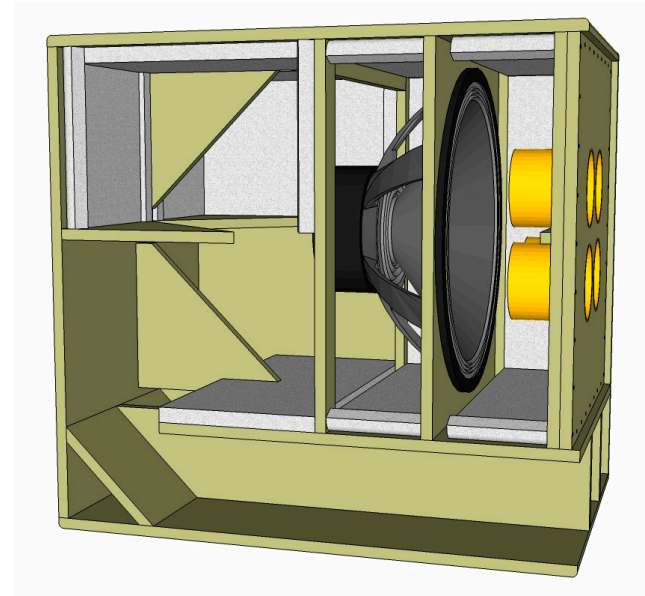
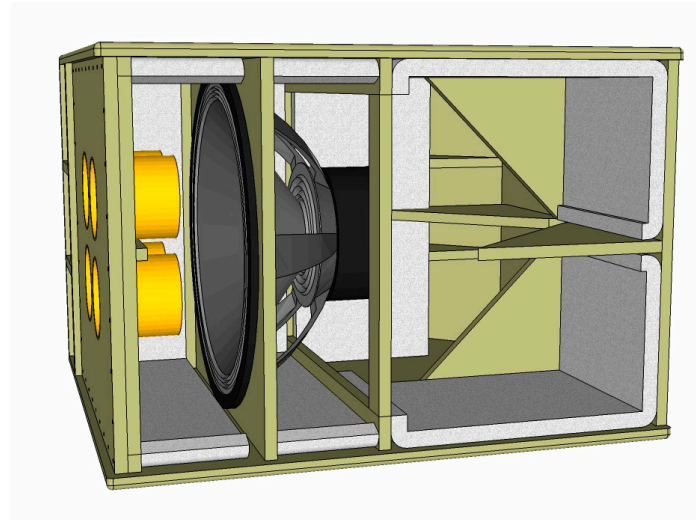
- > The enclosure should be made of baltic birch plywood (18mm thickness).
- > It should be used M4 and M6 bolts, proper length must be chosen: M6 is appropriate for speaker and M4 is suitable for frontal cover.
- > Steel M4 and M6 T-Nuts are recommended.



INTERNAL VIEW

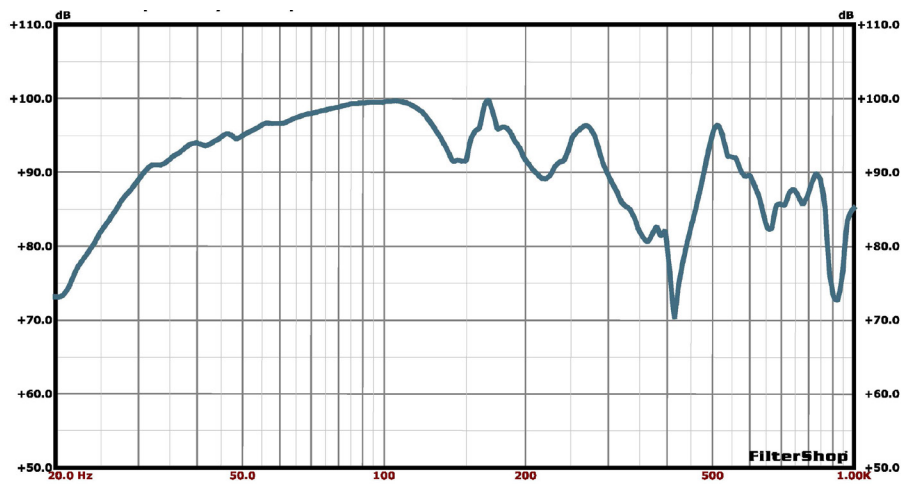
KEY FEATURES

- > Handling, rigging and connectors are at user's choice. It's very important that their placement should not influence in any way the proper vent functionality.
- > Accurate damping of the cabinet interior, as suggested in the pictures below, is highly recommended: high density synthetic fiber or Polyurethane foam should be used

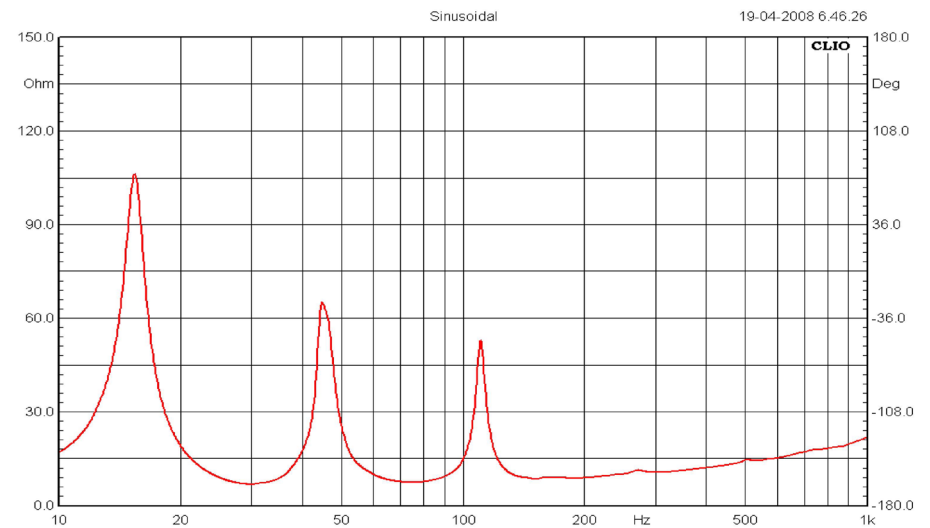


INTERNAL VIEW AND DAMPING

MEASUREMENTS: UNFILTERED FREQUENCY RESPONSE, 2.83V/1M AND RELATIVE INPUT IMPEDANCE CURVE WITH 21LW1400 LOUDSPEAKER



FREQUENCY RESPONSE



IMPEDANCE CURVE

PROCESSING GUIDELINES AND PROCESSOR RESPONSE



PROCESSOR SETTING RESPONSE

NECESSARY PROCESSOR SETTINGS WITH 21LW1400 LOUDSPEAKER

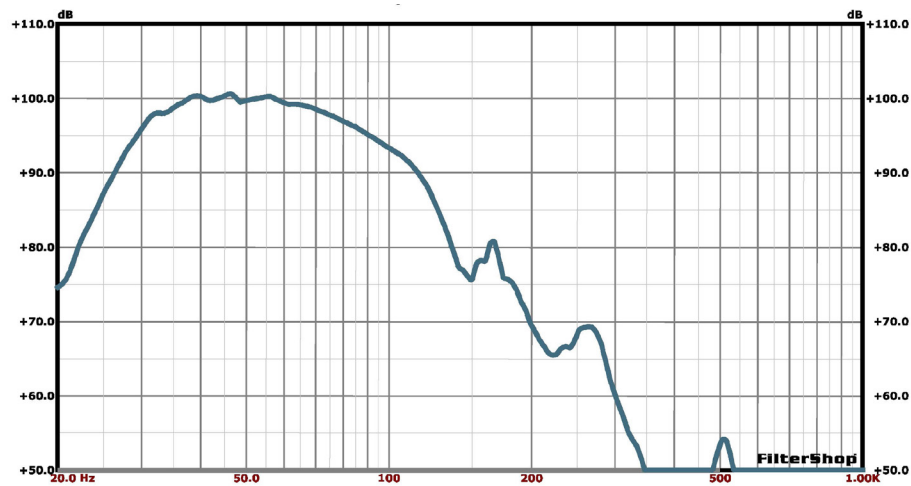
- > High pass: Butterworth 2nd order, 12dB/Oct @ 25 Hz
- > Parametric EQ Eq1: F= 28 Hz - Gain= +5 dB - Q= 1.2
Eq2: F= 90 Hz - Gain= - 5 dB - Q= 1.5
Eq3: F= 170 Hz - Gain= - 5 dB - Q= 2
- > Low pass: Butterworth 3th order, 18dB/Oct @ 85 Hz
- > Polarity: Positive (+)
- > Limiter: @ +10dBu, 100ms Atk. Time, X4 Release Time

- > Output Gain: + 5dB
Processing Parameters Referred to XTA DP224/DP226/DP448 Processors

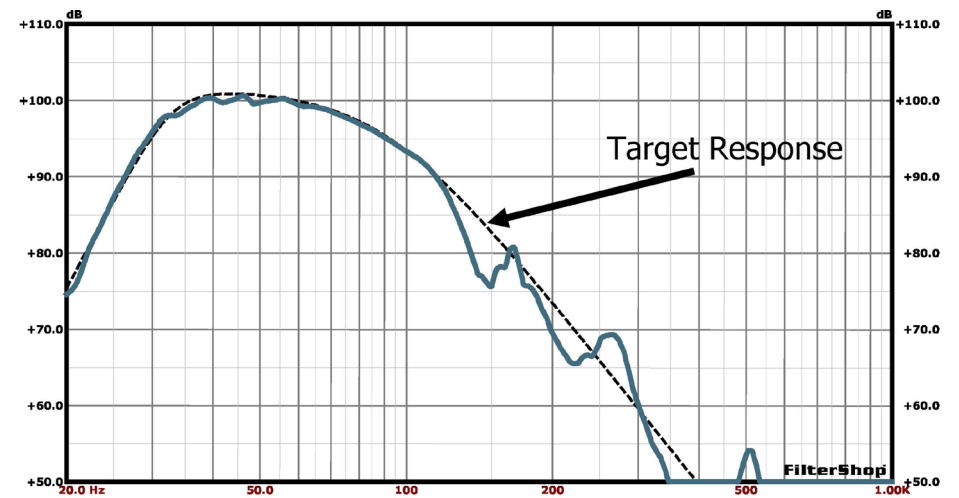
Required Amplifier for proper driving, approx.: 2000W @ 8 Ohm and Gain 32dB

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

PROCESSED FREQUENCY RESPONSE



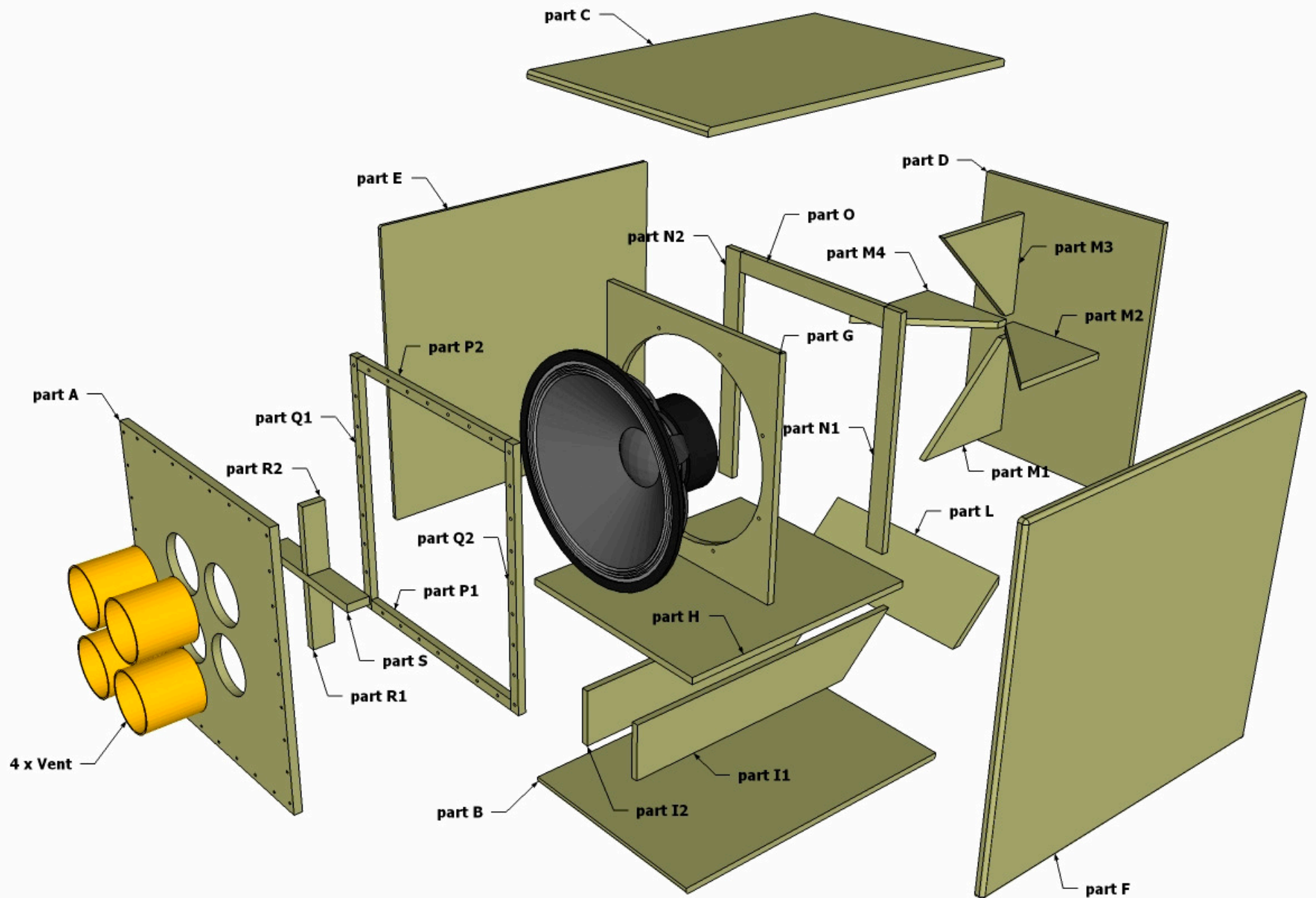
PROCESSED SUBWOOFER RESPONSE



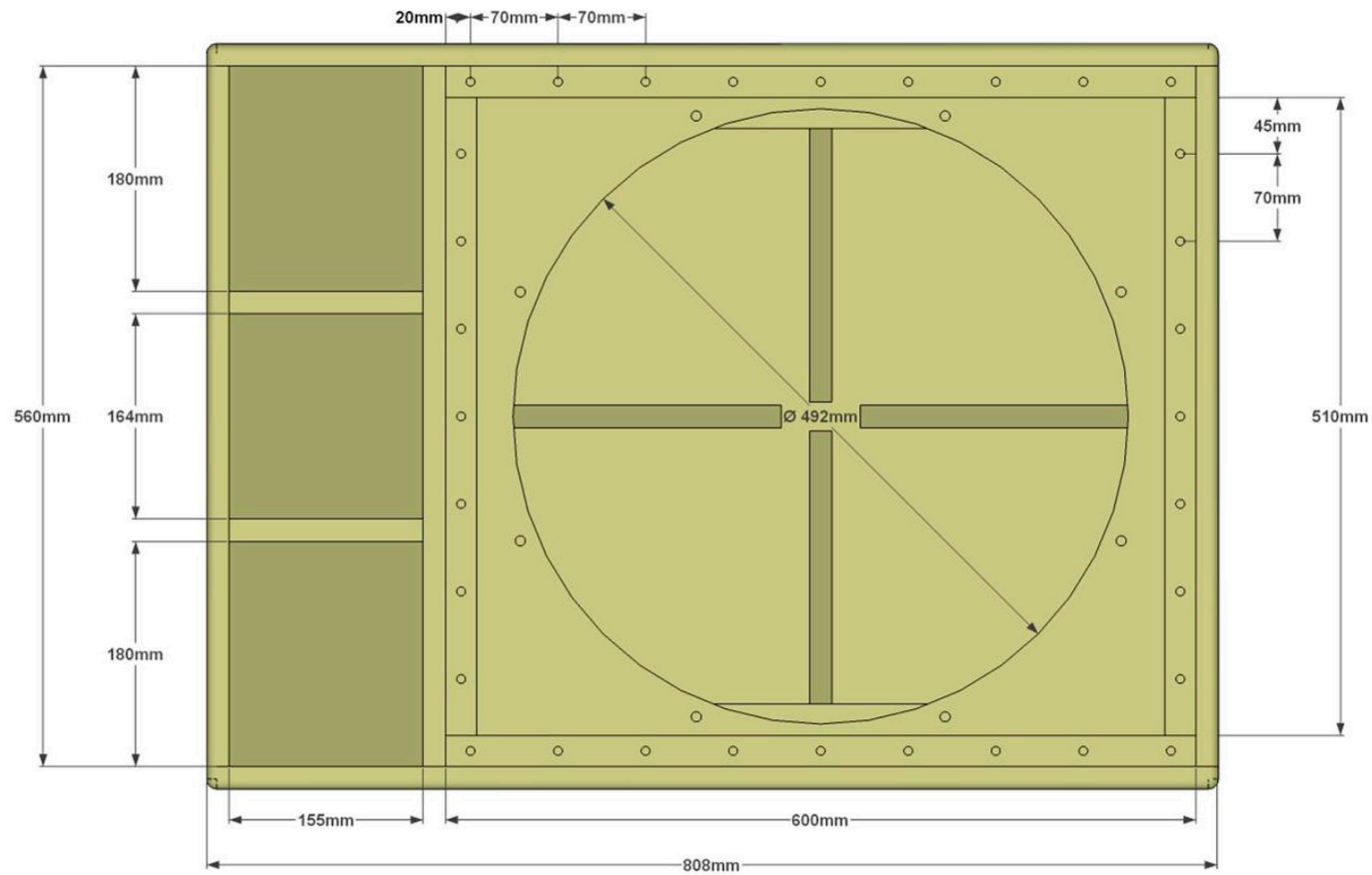
PROCESSED SUBWOOFER RESPONSE WITH TARGET RESPONSE MATCHING

NOTE: The Reference Target Response is an Acoustical Band-Pass Response of a total 10th order.
High Pass=Butterworth 6th Order @ 34Hz, Low-Pass=Linkwitz-Riley 4th Order @ 100Hz

EXPLODED VIEW



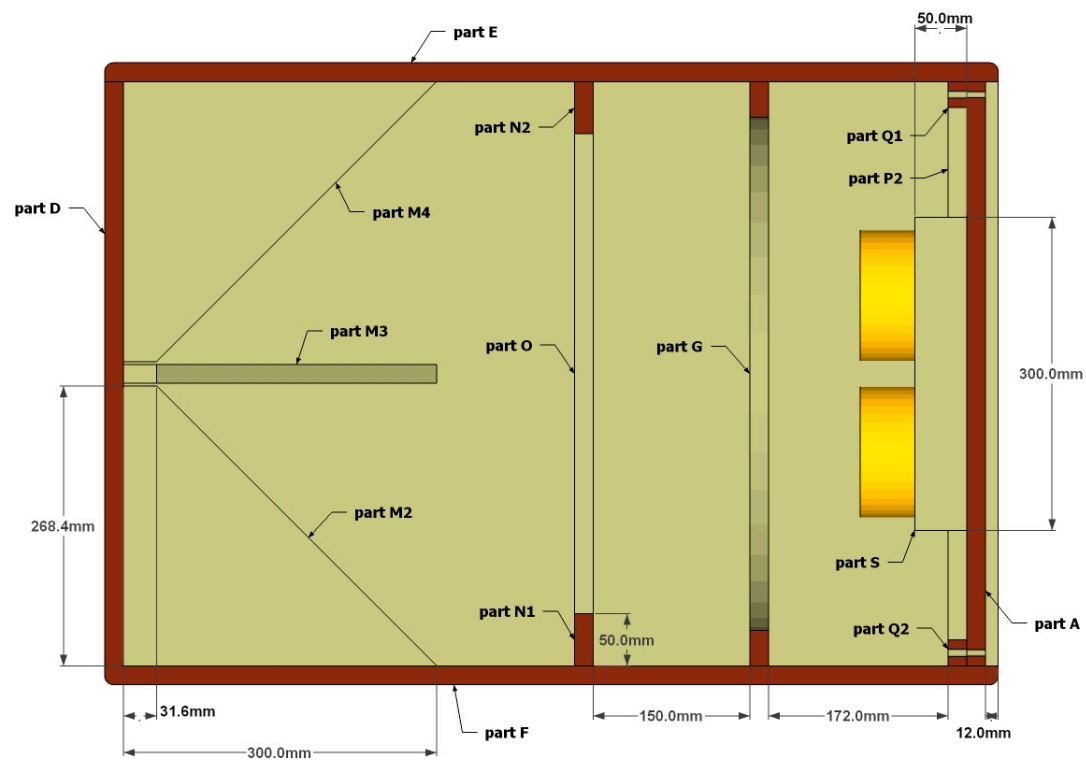
FRONT VIEW



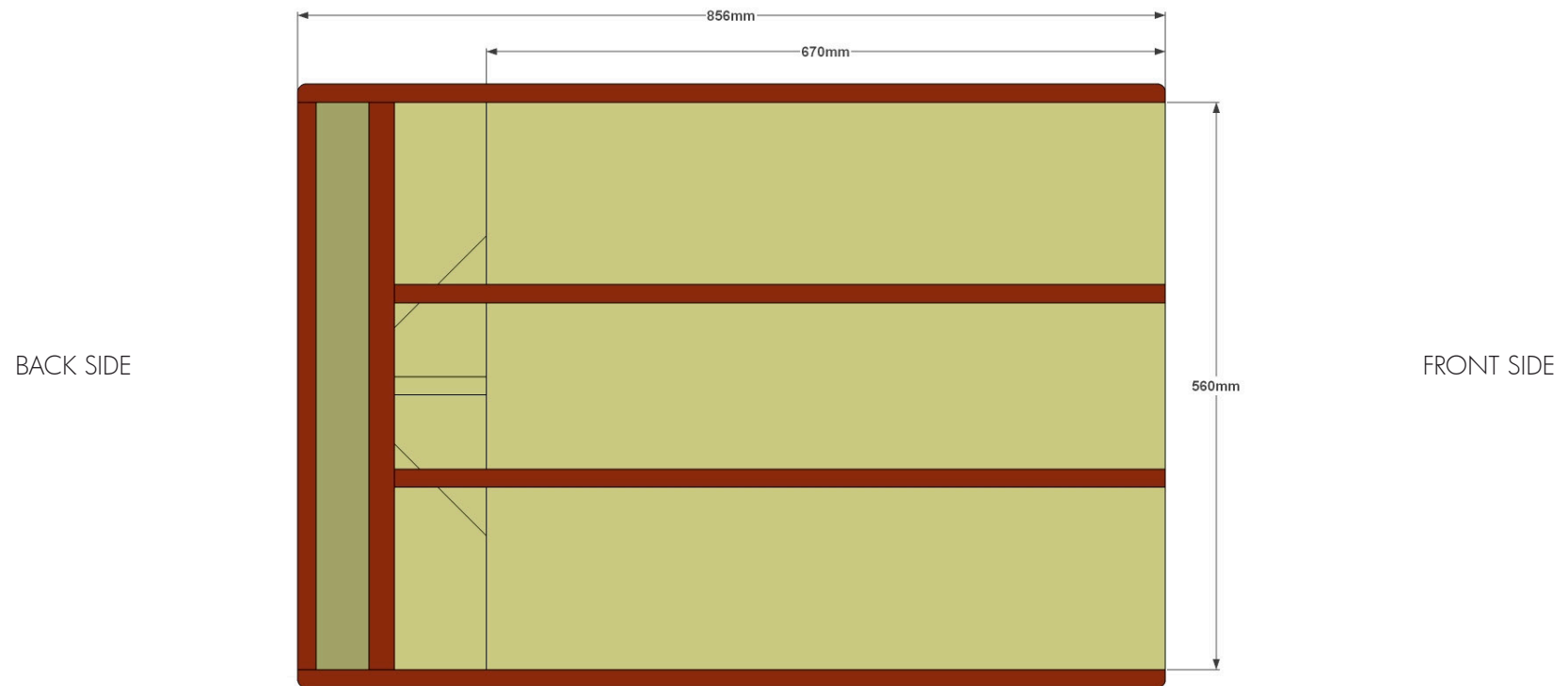
TOP SECTION

BACK SIDE

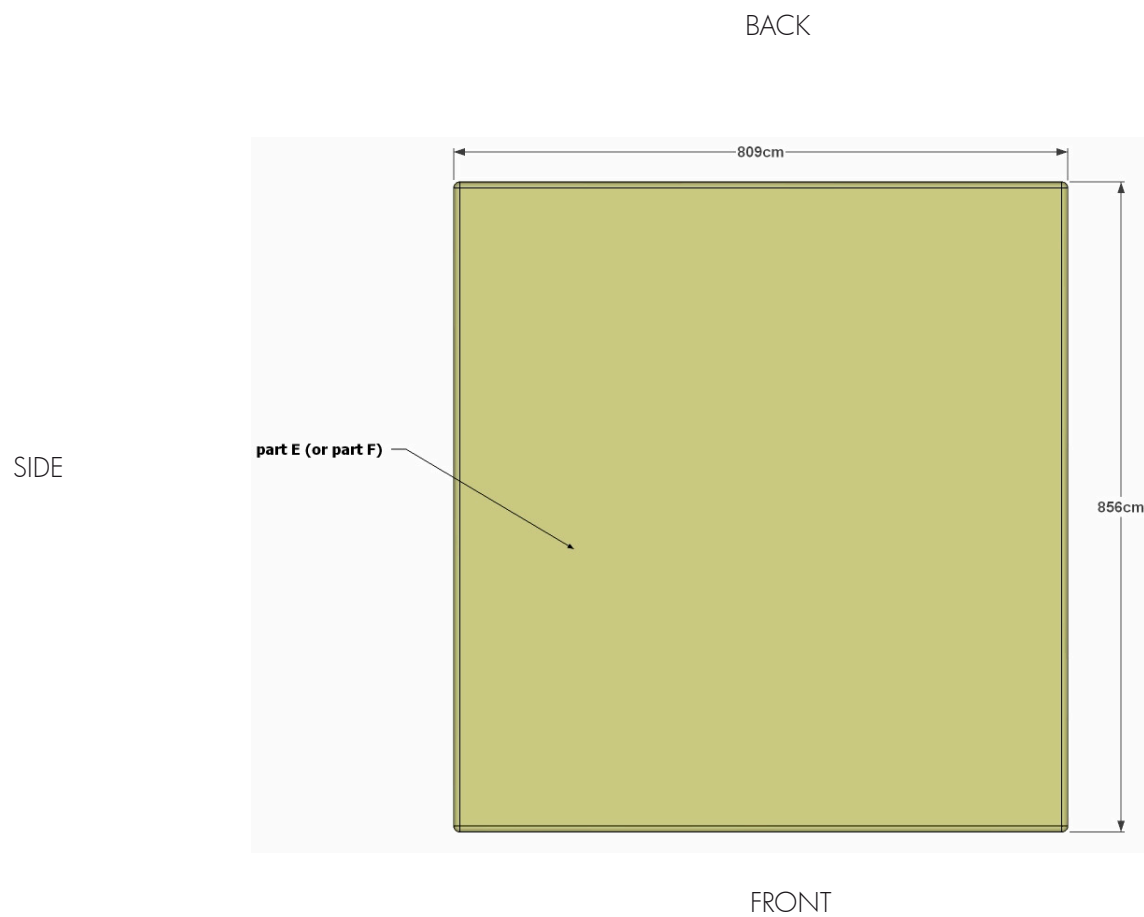
FRONT SIDE



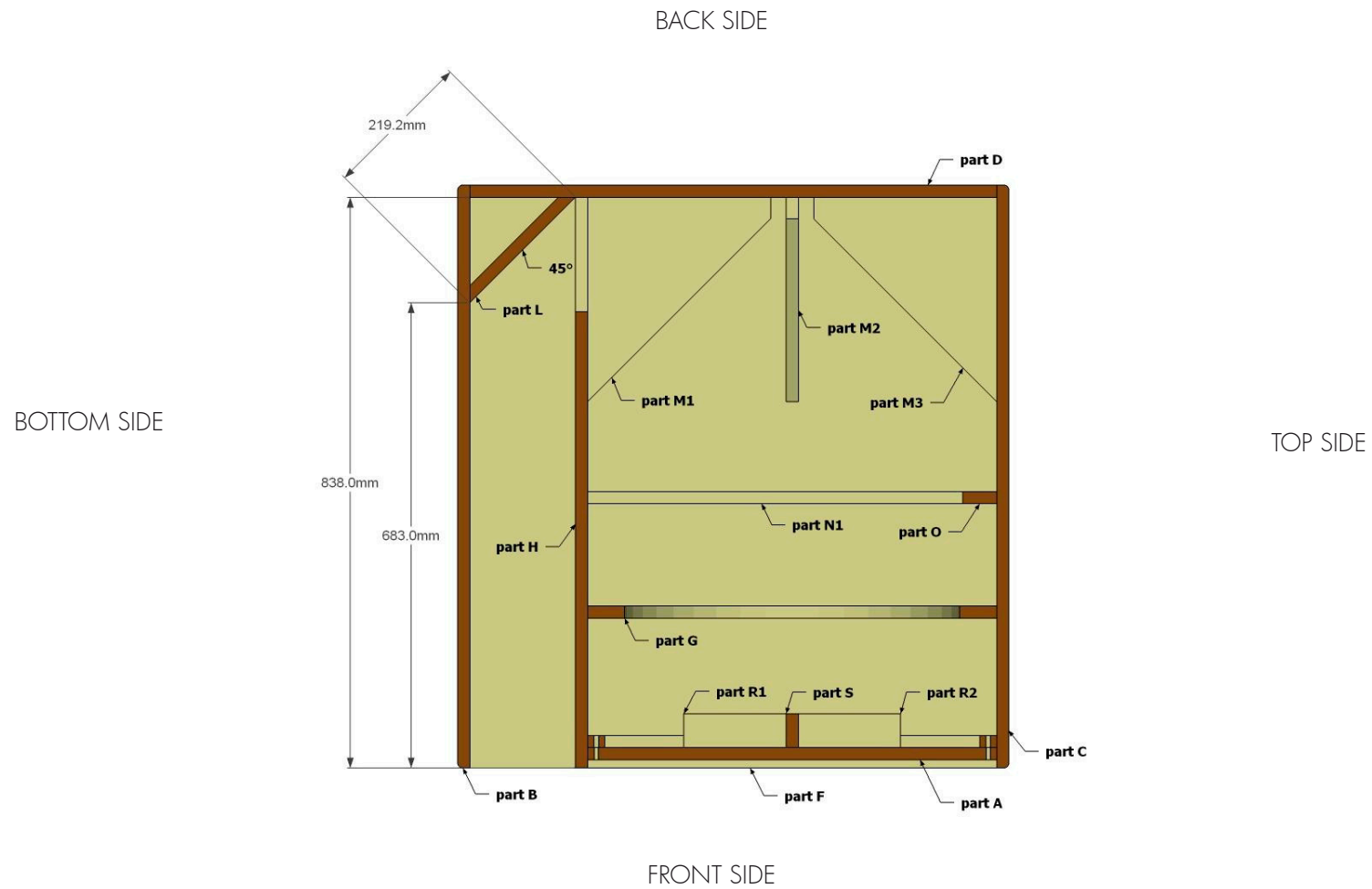
BOTTOM SECTION



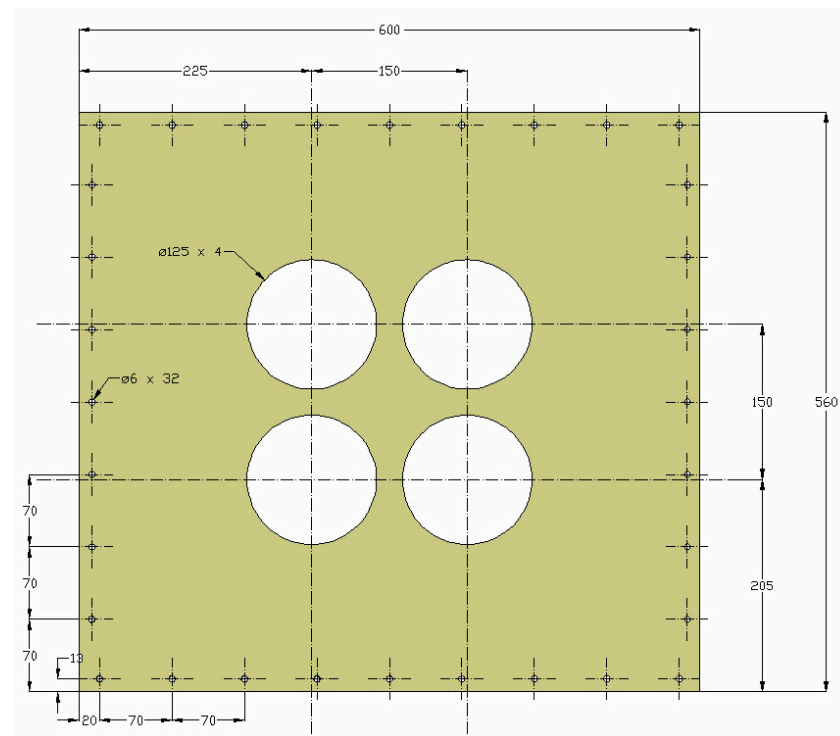
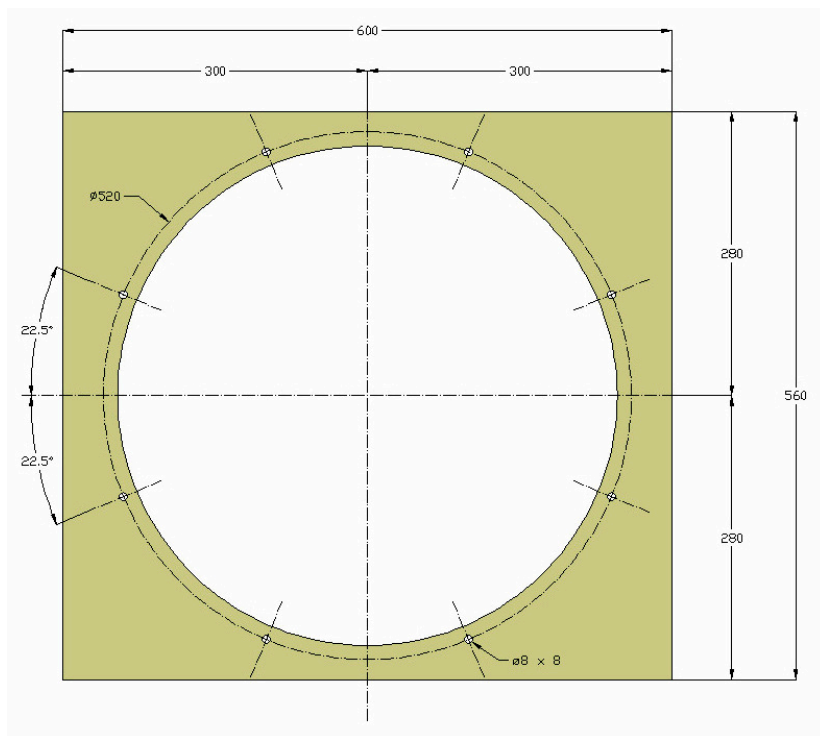
TOP - BOTTOM VIEW



SIDE SECTION



FRONT PANEL BOLT HOLES



NOTE: The Vent can also be made with 5" Standard PVC Pipes (127mm). In this case, the 4 holes should be augmented to 127mm and the length should be increased of about 6mm

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