

Skar DDX12D2 Paraflex Type A Classic

By: Robert Moon of:

Exxotic Audio

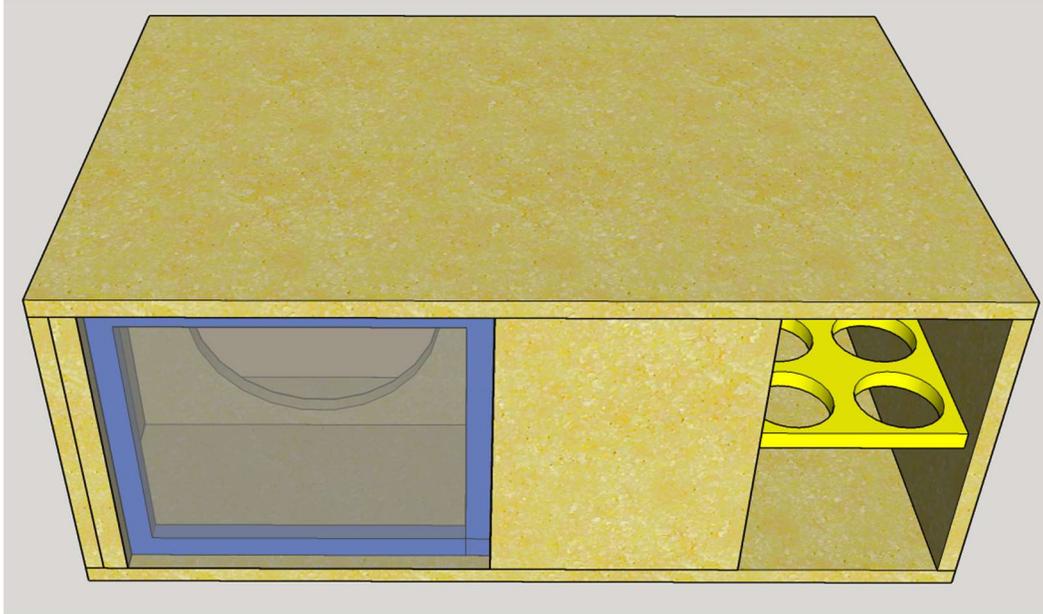
In conjunction with Matthew Morgan J

MMJ

of High Order Quarterwave Society

HOQWS

First build completed by: Casey Raynes



High Order Quarter Wave design for:

1 Skar Audio DDX 12 D2

**Footnote about the suggested Skar DDX12 driver.

This drive comes with a very stiff suspension that requires a strenuous break in. We suggest a free-air break in period of 24 hours on a 20hz signal strong enough to get the cone moving freely before installing it into the enclosure.



DESCRIPTION	SPECIFICATIONS
The Skar Audio DDX-12 D2 is a competition grade, 12-inch, dual 2-ohm, car subwoofer. The DDX line-up was engineered by Skar Audio to be a SPL grade woofer that could also be utilized in daily system applications, allowing non-competitors to use the same subwoofers as those competing in the lanes. The DDX-12 is equipped with an advanced air flow cooling system to help dissipate heat, enabling it to provide continuous reliable power.	
Conservatively rated at 1,500 watts peak power and 1,000 watts RMS power, this subwoofer was engineered to be extremely loud. Featuring a massive double stack 202 oz motor, 2.5" pure copper high temperature voice coil, and a competition grade pressed paper cone, stitched to the high roll foam surround, the DDX-12 comes equipped ready to handle serious amounts of power.	
RMS Power Handling	1,000 Watts
Peak Power Handling	1,500 Watts
Voice Coil Size	2.5"
Voice Coil Configuration	Dual 2 Ω
SUBWOOFER MEASUREMENTS	
Cut-out Diameter	11.25"
Mounting Depth	6.60"
Total Height	7.50"
Outside Diameter	12.54"
Magnet Diameter	7.72"

DESCRIPTION	SPECIFICATIONS																																				
<table border="1"> <thead> <tr> <th colspan="2">Thiele-Small</th> <th colspan="2">Electro-Mechanical</th> </tr> </thead> <tbody> <tr> <td>Sd</td> <td>506.70 cm²</td> <td>Le</td> <td>1.07 mH</td> </tr> <tr> <td>Re</td> <td>0.98 ohms</td> <td>Pmax</td> <td>1000 W</td> </tr> <tr> <td>fs</td> <td>38.47 Hz</td> <td>Xmax</td> <td>15.0 mm</td> </tr> <tr> <td>Vas</td> <td>22.30 litres</td> <td>Bl</td> <td>13.95</td> </tr> <tr> <td>Qes</td> <td>0.34</td> <td>Mmd</td> <td>274.42</td> </tr> <tr> <td>Qms</td> <td>5.15</td> <td colspan="2">SKAR DDX 12" D2</td> </tr> <tr> <td>Qts</td> <td>0.32</td> <td colspan="2">Measured by J Vansickle of PARAGON CONCEPT (S&L WT2)</td> </tr> <tr> <td colspan="4">EFFECTIVE MOTOR FORCE SCORE (accounting for Lossy Le)= 102</td> </tr> </tbody> </table>		Thiele-Small		Electro-Mechanical		Sd	506.70 cm ²	Le	1.07 mH	Re	0.98 ohms	Pmax	1000 W	fs	38.47 Hz	Xmax	15.0 mm	Vas	22.30 litres	Bl	13.95	Qes	0.34	Mmd	274.42	Qms	5.15	SKAR DDX 12" D2		Qts	0.32	Measured by J Vansickle of PARAGON CONCEPT (S&L WT2)		EFFECTIVE MOTOR FORCE SCORE (accounting for Lossy Le)= 102			
Thiele-Small		Electro-Mechanical																																			
Sd	506.70 cm ²	Le	1.07 mH																																		
Re	0.98 ohms	Pmax	1000 W																																		
fs	38.47 Hz	Xmax	15.0 mm																																		
Vas	22.30 litres	Bl	13.95																																		
Qes	0.34	Mmd	274.42																																		
Qms	5.15	SKAR DDX 12" D2																																			
Qts	0.32	Measured by J Vansickle of PARAGON CONCEPT (S&L WT2)																																			
EFFECTIVE MOTOR FORCE SCORE (accounting for Lossy Le)= 102																																					
Voice Coils Wired in Parallel																																					
<table border="1"> <thead> <tr> <th colspan="2">Thiele-Small</th> <th colspan="2">Electro-Mechanical</th> </tr> </thead> <tbody> <tr> <td>Sd</td> <td>506.70 cm²</td> <td>Le</td> <td>4.28 mH</td> </tr> <tr> <td>Re</td> <td>3.92 ohms</td> <td>Pmax</td> <td>1000 W</td> </tr> <tr> <td>fs</td> <td>38.47 Hz</td> <td>Xmax</td> <td>15.0 mm</td> </tr> <tr> <td>Vas</td> <td>22.30 litres</td> <td>Bl</td> <td>27.99</td> </tr> <tr> <td>Qes</td> <td>0.34</td> <td>Mmd</td> <td>274.42</td> </tr> <tr> <td>Qms</td> <td>5.15</td> <td colspan="2">SKAR DDX 12" D2</td> </tr> <tr> <td>Qts</td> <td>0.32</td> <td colspan="2">Measured by J Vansickle of PARAGON CONCEPT (S&L WT2)</td> </tr> <tr> <td colspan="4">EFFECTIVE MOTOR FORCE SCORE (accounting for Lossy Le)= 102</td> </tr> </tbody> </table>		Thiele-Small		Electro-Mechanical		Sd	506.70 cm ²	Le	4.28 mH	Re	3.92 ohms	Pmax	1000 W	fs	38.47 Hz	Xmax	15.0 mm	Vas	22.30 litres	Bl	27.99	Qes	0.34	Mmd	274.42	Qms	5.15	SKAR DDX 12" D2		Qts	0.32	Measured by J Vansickle of PARAGON CONCEPT (S&L WT2)		EFFECTIVE MOTOR FORCE SCORE (accounting for Lossy Le)= 102			
Thiele-Small		Electro-Mechanical																																			
Sd	506.70 cm ²	Le	4.28 mH																																		
Re	3.92 ohms	Pmax	1000 W																																		
fs	38.47 Hz	Xmax	15.0 mm																																		
Vas	22.30 litres	Bl	27.99																																		
Qes	0.34	Mmd	274.42																																		
Qms	5.15	SKAR DDX 12" D2																																			
Qts	0.32	Measured by J Vansickle of PARAGON CONCEPT (S&L WT2)																																			
EFFECTIVE MOTOR FORCE SCORE (accounting for Lossy Le)= 102																																					
Voice Coils Wired in Series																																					

Enclosure Specifications:
 High Order Quarter Wave "Paraflex Type A Classic":
 External Dimensions: 36" X 24" x 14.5"
 Gross Volume: 8.15625cu ft.
 Net Volume: 6.150390625cu ft
 Tuning: 36hz

Hornresp Entries

Hornresp - Input Parameters

File Tools Window Help

Tools->Chamber Type->"Rear Vented"

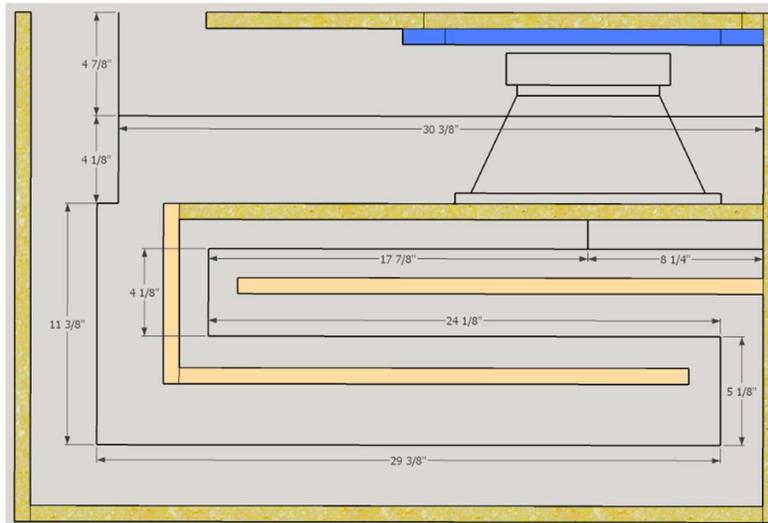
Ang	2.0 x Pi	Eg	37.00	Rg	0.00	Fta	0.00
S1	230.64	S2	230.64	Exp	20.96	F12	0.00
S2	230.64	S3	524.19	Exp	233.68	F23	9.62
S3	524.19	S4	691.93	Par	10.48	F34	0.00
S4	691.93	S5	691.93	Par	12.38	F45	0.00

Sd	506.70	Cms	6.09E-05	Mmd	274.42	Re	0.98
Bl	13.95	Rms	13.19	Le	1.07	TH	1
Vrc	0.60	Ap	691.93	Vtc	0.00		
Lrc	0.60	Lpt	89.54	Atc	0.00		

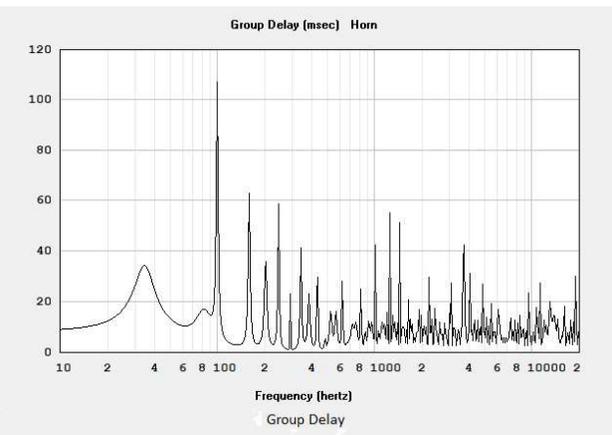
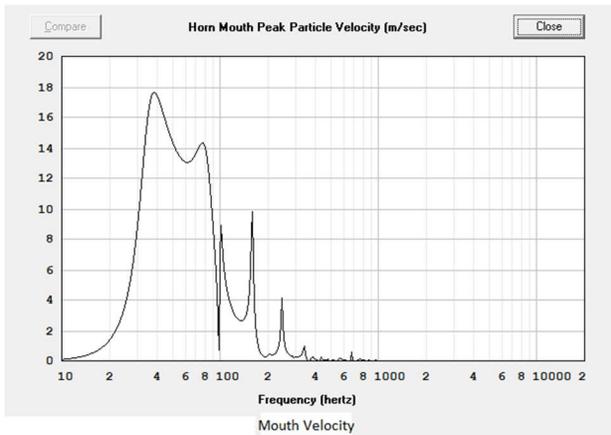
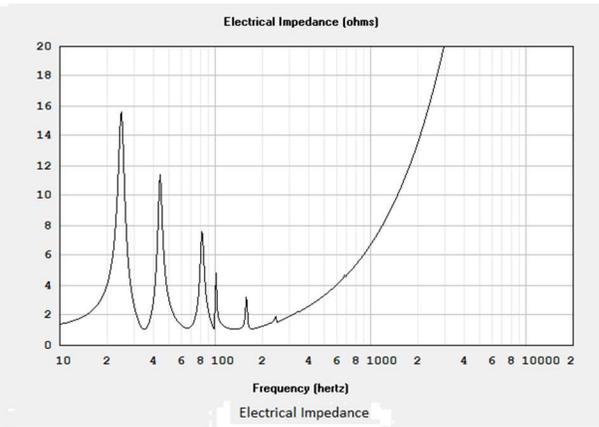
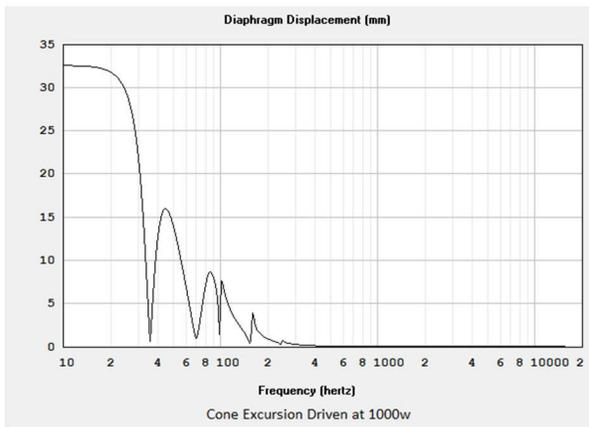
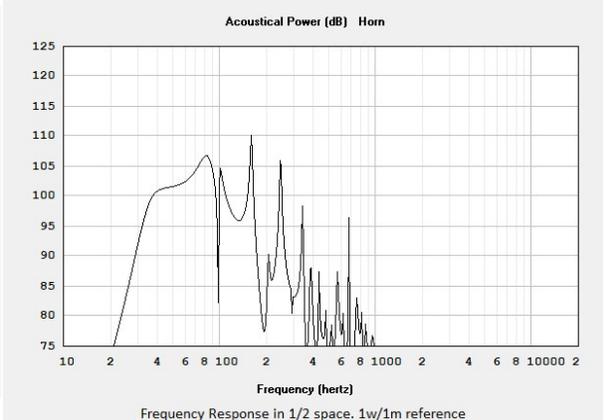
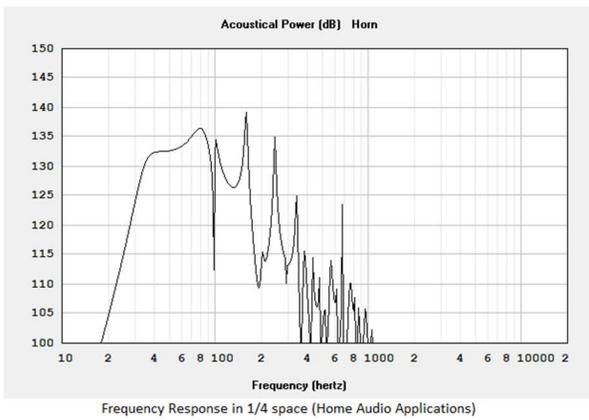
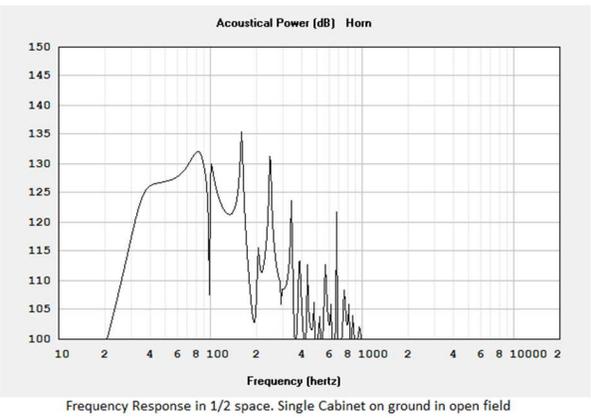
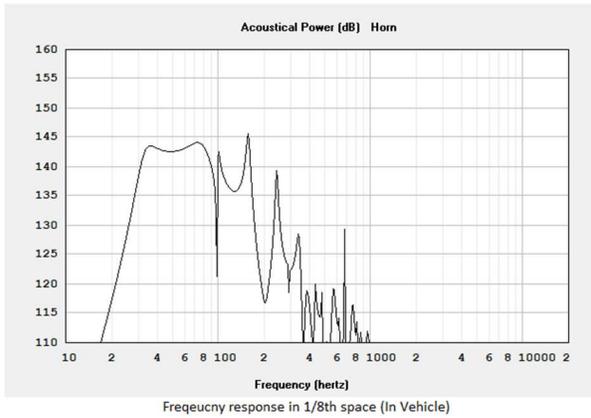
Comment Skar DDX 12 D2 Type A Classic (small)

Previous Next Edit Add Delete Record 13 of 16 Calculate

Path Lengths:



Enclosure Projections:



External Dimensions:
36"wide X 24"deep X 14.5"tall

Cut Sheet:

All material is $\frac{3}{4}$ " Ply (standard sheets are 96" x 48")

Top and Bottom: 36" x 24"

Sides (2): 24" x 13"

Back: 34.5" x 13"

Front Panel: 10 $\frac{1}{4}$ " x 13"

Front Spacer Panel: 1" x 13"

Access Panel: 15" x 13" (optional $\frac{3}{4}$ " acrylic/plexi)

Access Panel Mounting Bracket: 17" x 13" (see layout)

Baffle: 27 $\frac{1}{2}$ " x 13" (see layout)

Line Panel 1: 24 $\frac{3}{4}$ " X 13"

Line Panel 2: 24" x 13"

Line Panel 3: 8 $\frac{1}{2}$ " x 13"

Brace 1: 27 $\frac{1}{2}$ " x 2 $\frac{3}{4}$ " (see layout)

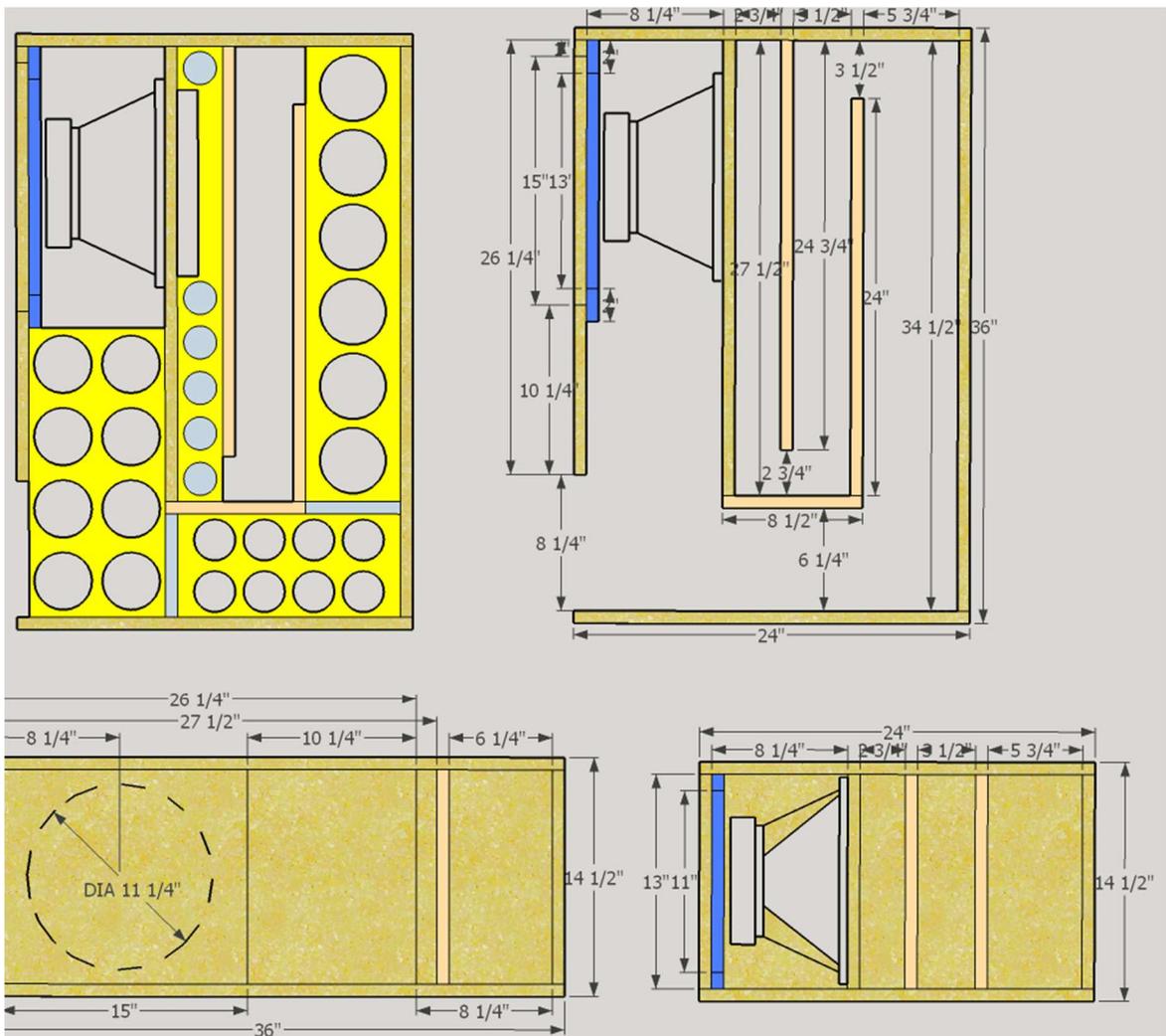
(optional) Brace 2: 27 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " (see layout)

Brace 3: 27 $\frac{1}{2}$ " x 5 $\frac{3}{4}$ "

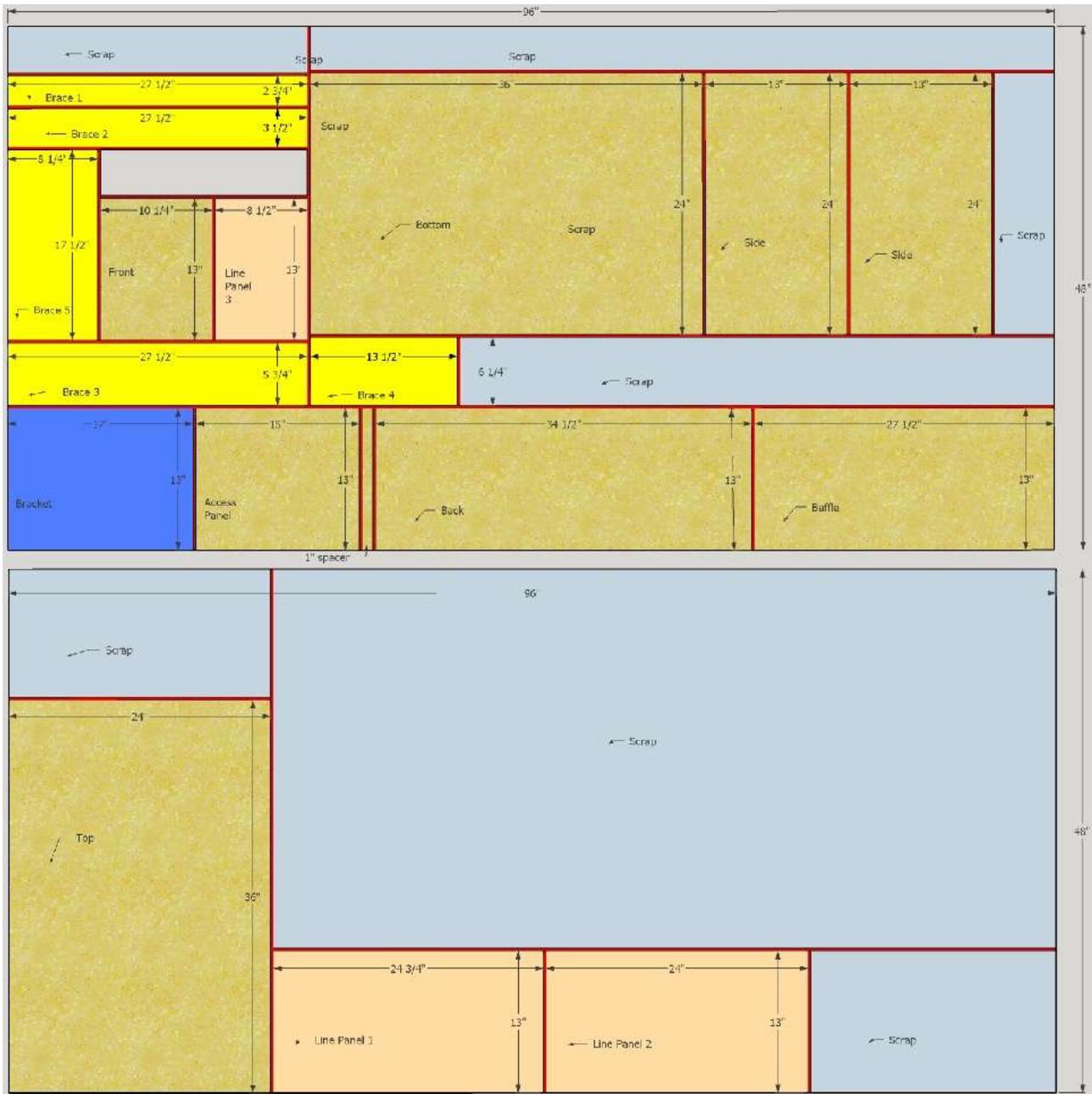
Brace 4: 13 $\frac{1}{2}$ " x 6 $\frac{1}{4}$ "

Brace 5: 17 $\frac{1}{2}$ " x 8 $\frac{1}{4}$ "

2 Dimensional Layout (shown without optional brace 2)



CNC Optimized Cut Sheet:



#	Panel	Cut	Dim
1	96"x48"	y=13"	96"
2	96"x13"	y=17"	13"
3	78 3/4"x13"	y=15"	13"
4	96"x34 3/4"	y=27 1/2"	34 3/4"
5	27 1/2"x34 3/4"	y=5 3/4"	27 1/2"
6	27 1/2"x28 3/4"	y=17 1/2"	27 1/2"
7	27 1/2"x17 1/2"	y=8 1/4"	17 1/2"
8	19"x17 1/2"	y=13"	19"
9	19"x13"	y=10 1/4"	13"
10	27 1/2"x11"	y=3 1/2"	27 1/2"
11	68 1/4"x34 3/4"	y=6 1/4"	68 1/4"
12	68 1/4"x6 1/4"	y=13 1/2"	6 1/4"
13	27 1/2"x7 1/4"	y=2 3/4"	27 1/2"
14	63 1/2"x13"	y=1"	13"
15	68 1/4"x28 1/4"	y=24"	68 1/4"
16	68 1/4"x24"	y=36"	24"
17	62 1/4"x13"	y=34 1/2"	13"
18	32"x24"	y=13"	24"
19	18 3/4"x24"	y=13"	24"
1	96"x48"	y=24"	48"
2	24"x48"	y=36"	24"
3	71 3/4"x48"	y=13"	71 3/4"
4	71 3/4"x13"	y=24 3/4"	13"
5	46 3/4"x13"	y=24"	13"

Global statistics	
Used stock sheets	2
Total used area	5023.25 in ² - 55%
Total wasted area	4192.75 in ² - 45%
Total cuts	24
Total cut length	726 3/4"
Cut / blade / kerf thickness	1/4"

Sheet statistics < 1 / 2 >	
Stock sheet	3/4" Ply - 96"x48"
Used area	3525.5 in ² - 77%
Wasted area	1082.5 in ² - 23%
Cuts	19
Cut length	557"
Panels	15
Wasted panels	5

Table Saw Optimized Cut Sheet (Least Blade Adjustments):

The majority of issues with boxes built using table saws happen when adjustments are made. This method does waste a bit more material, but we feel it assists with consistent panel fitment. You are welcome to redistribute the cuts into other directions if you would like to conserve material.

Cut Order:

Set Saw to 13" and make 7 cuts on the Y axis of Board 1

Set saw to 15" and cut one piece from the first 13" panel (Access Panel finished)

Set saw to 8 1/2" and cut one piece from the first 13" panel (Line Panel 3 finished)

Set saw to 10 1/4" and cut one piece from first 13" panel (Front Panel finished)

Set Saw to 1" and cut one piece from remaining piece of first 13" panel (Spacer finished)

Set saw to 24 3/4" and cut one piece from second 13" panel (Line Panel 1 finished)

Set saw to 17 and cut one piece from remainder of second 13" panel (See Layout for finished bracket)

Set saw to 24" and cut one piece from the third, fourth, and fifth 13" panels (Sides and Line Panel 2 Finished)

With saw still set to 24", make 2 cuts on the Y axis of Board 2

Set saw to 34.5" and cut 1 piece from the sixth 13" panel of Board 1 (Back finished)

Set saw to 27 1/2" and cut one piece from seventh 13" panel of Board 1 (See layout for baffle)

With saw still set to 27.5" make a cut on the Y axis of remainder of board 2

Set saw to 36" and cut a piece from first and second 24" panels (Top and Bottom finished)

Set saw to 2 3/4" and cut one piece from 27 1/2" panel (See Brace 1 layout)

Set saw to 3 1/2" and cut one piece from 27 1/2" panel (See Brace 2 layout)

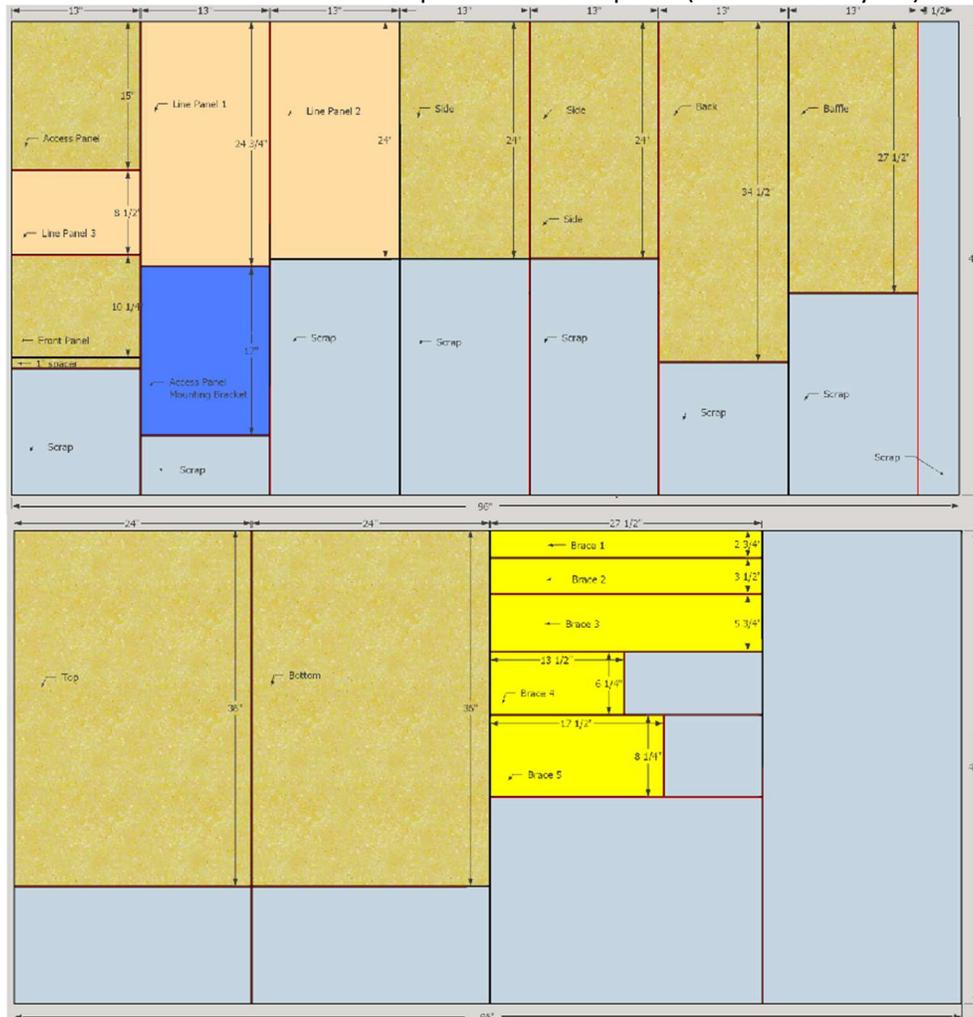
Set saw to 5 3/4" and cut one piece from the 27 1/2" panel (See brace 3 layout)

Set saw to 6 1/4" and cut one piece from 27 1/2" panel

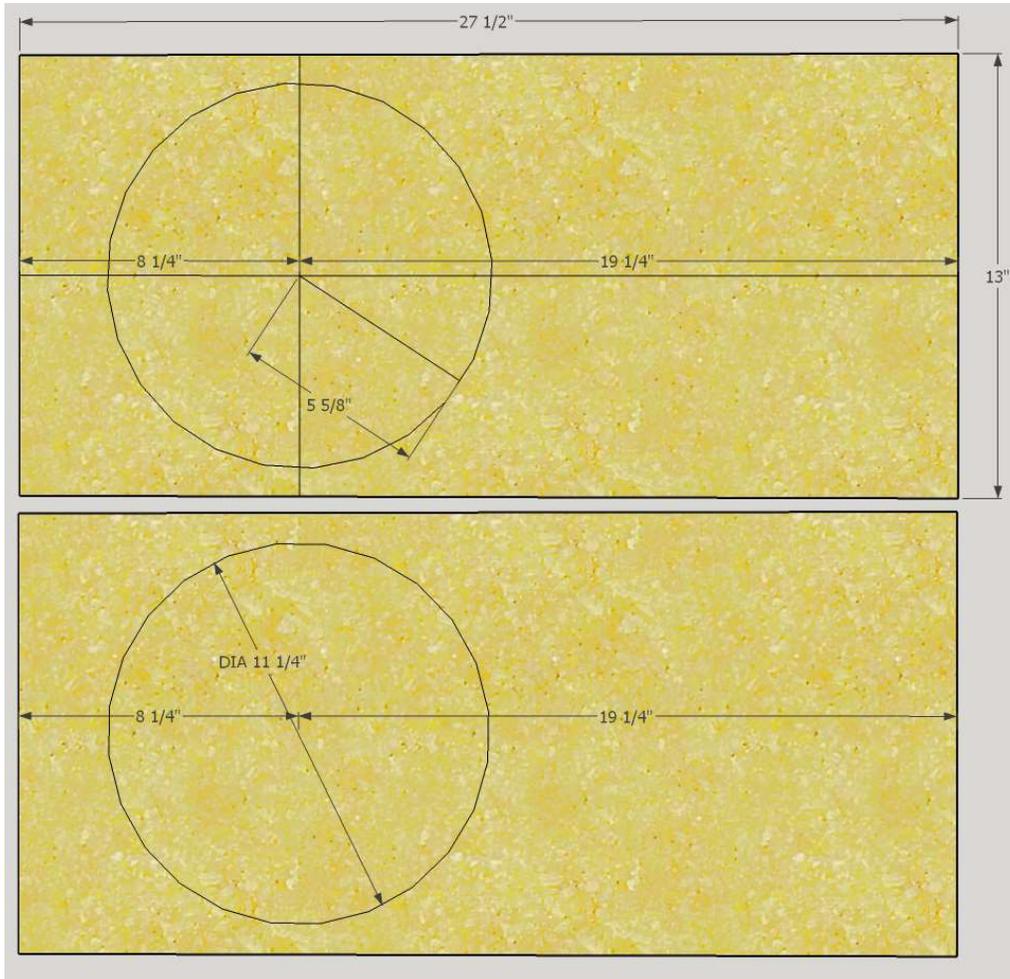
Set saw to 8 1/4" and cut one piece from 27 1/2" panel

Set saw to 13 1/2" and cut one piece from the 6 1/4" panel (See Brace 4 layout)

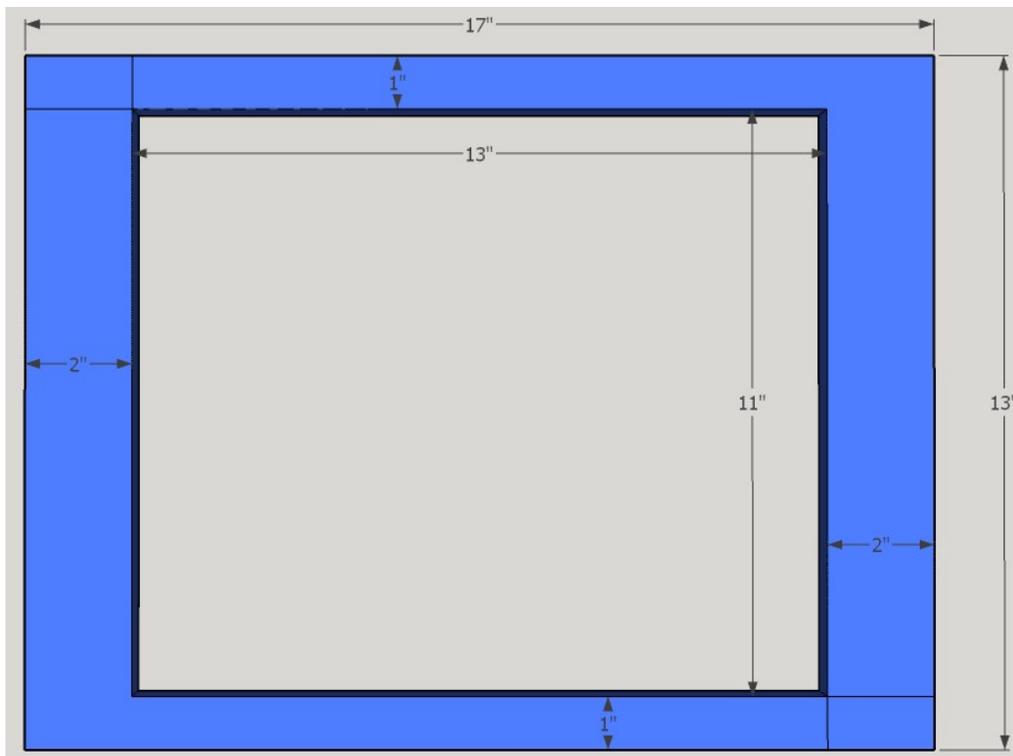
Set saw to 17 1/2" and cut one piece from 8 1/4" panel (See Brace 5 layout)



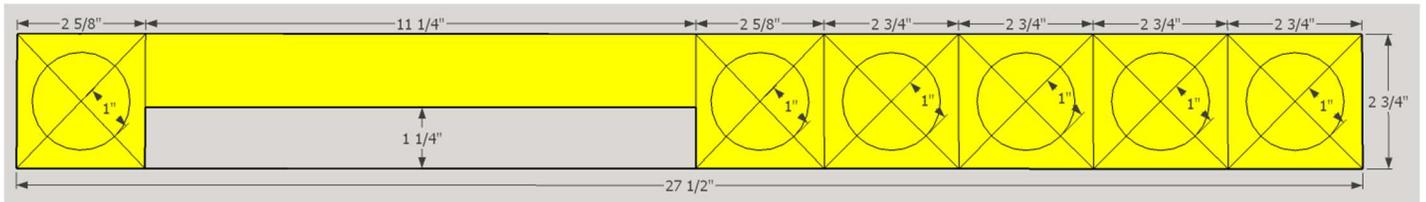
Baffle Layout



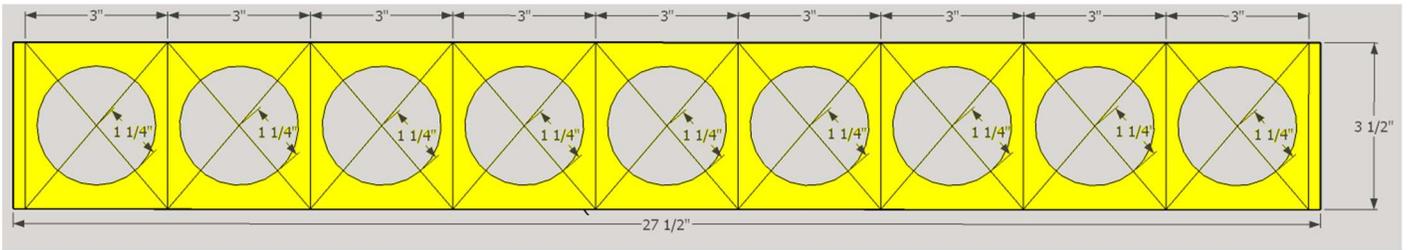
Access Panel Mounting Bracket layout



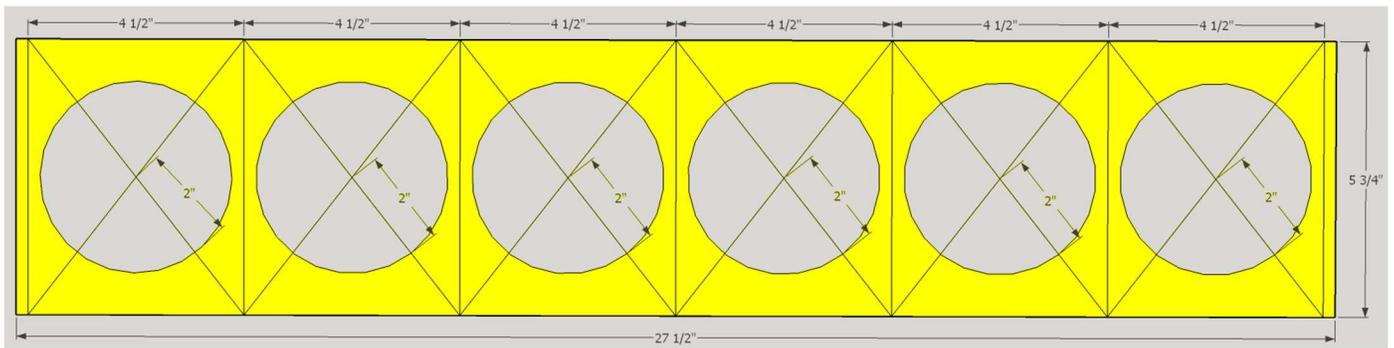
Brace 1 Layout



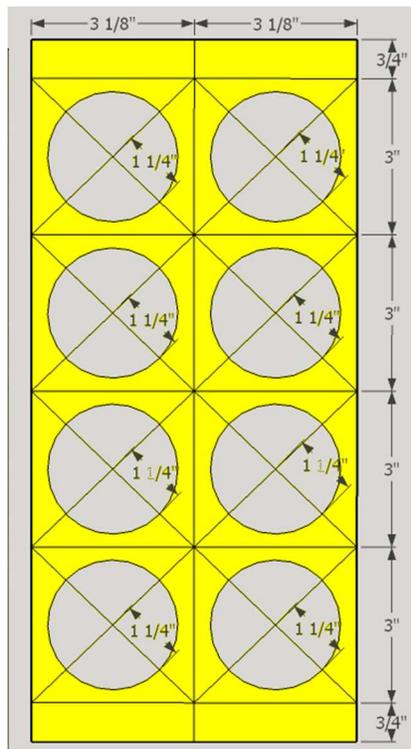
(optional) Brace 2 Layout



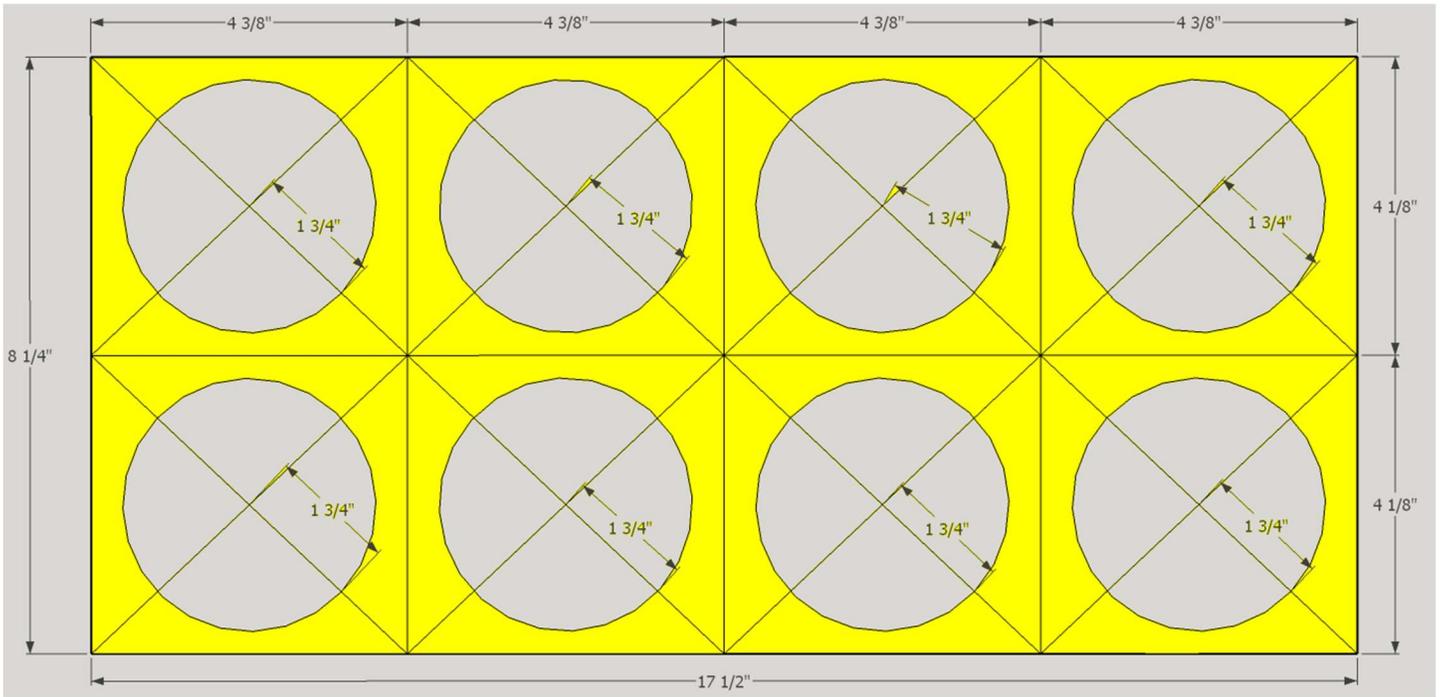
Brace 3 Layout



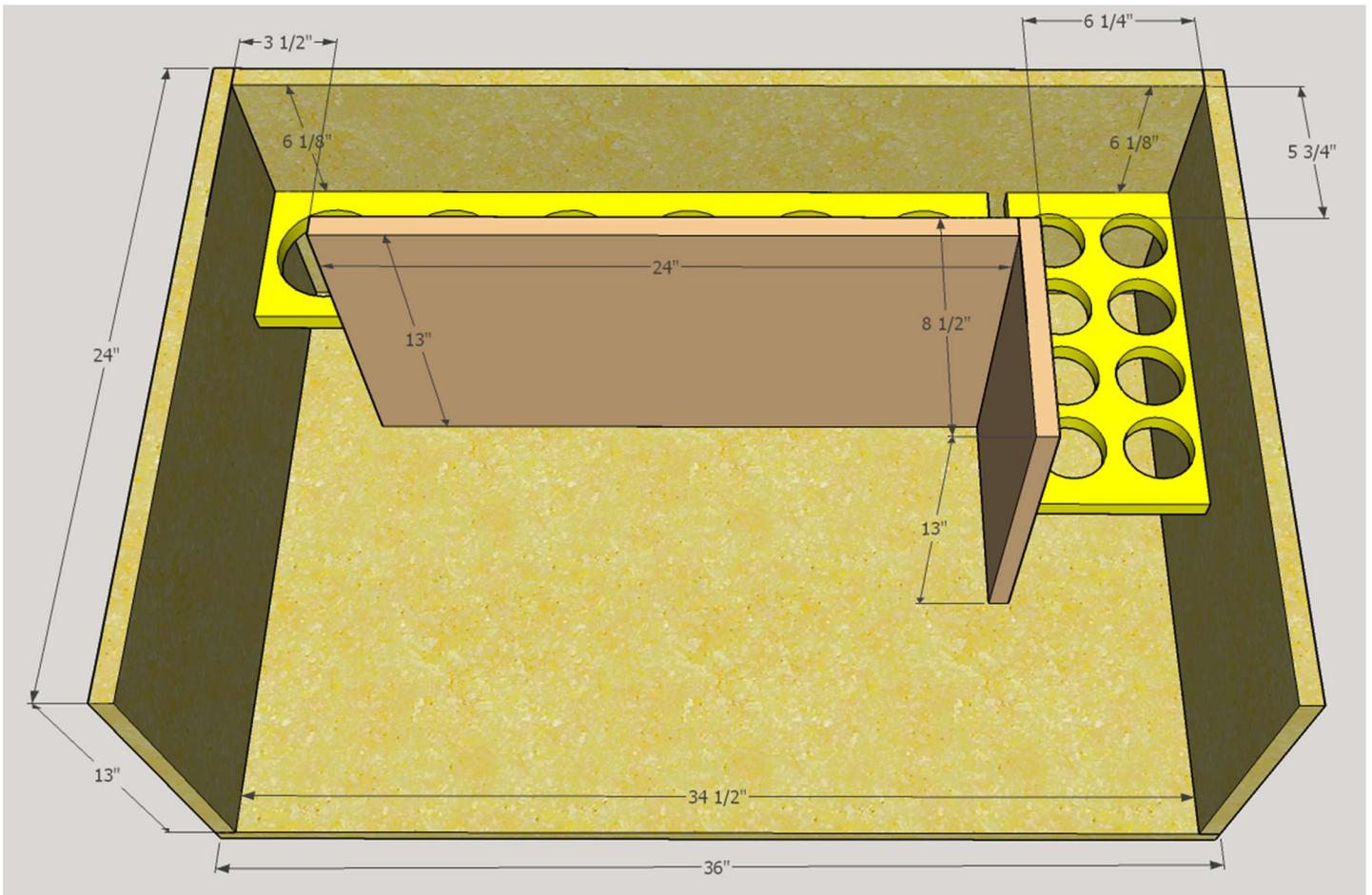
Brace 4 Layout



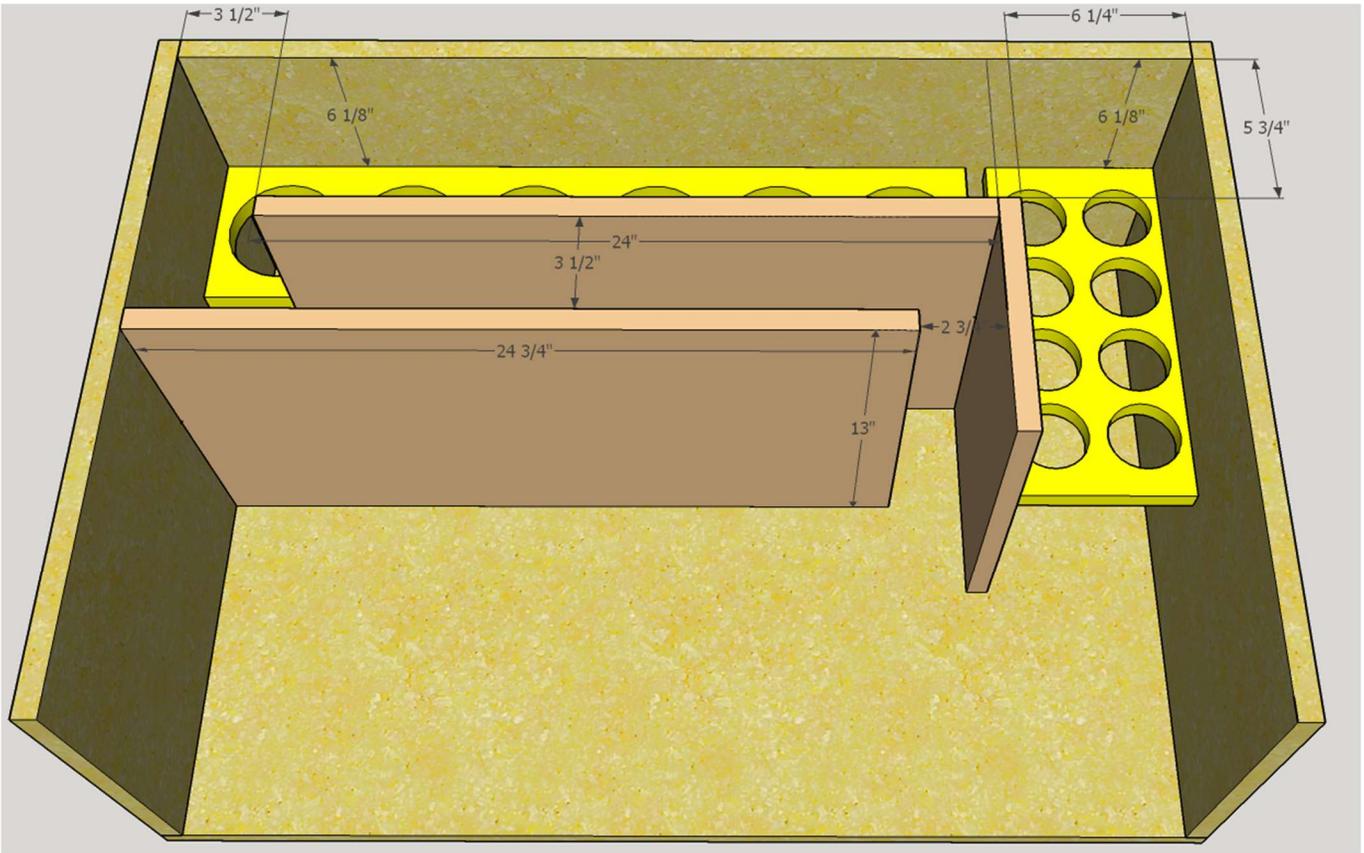
Brace 5 Layout



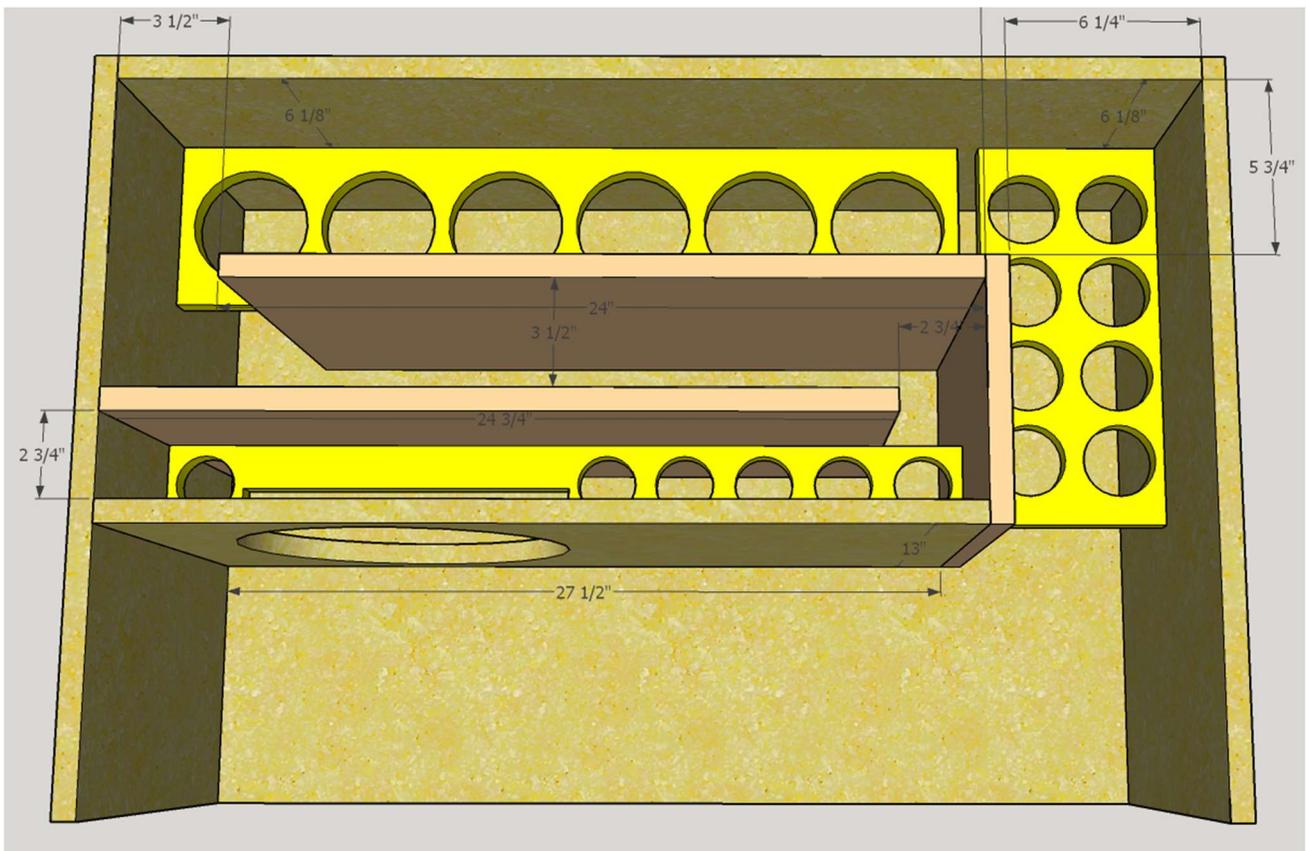
Buildup 1



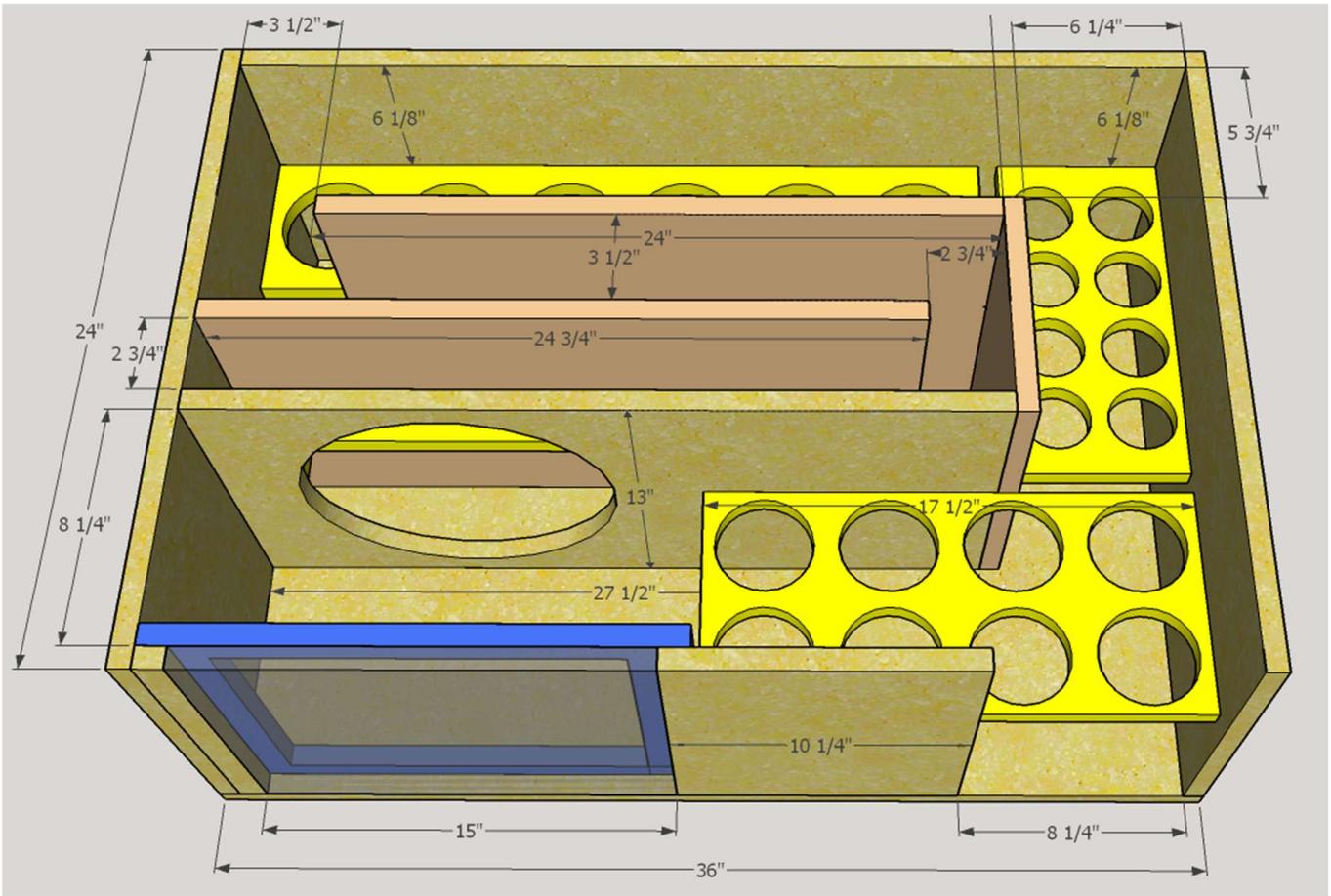
Buildup 2



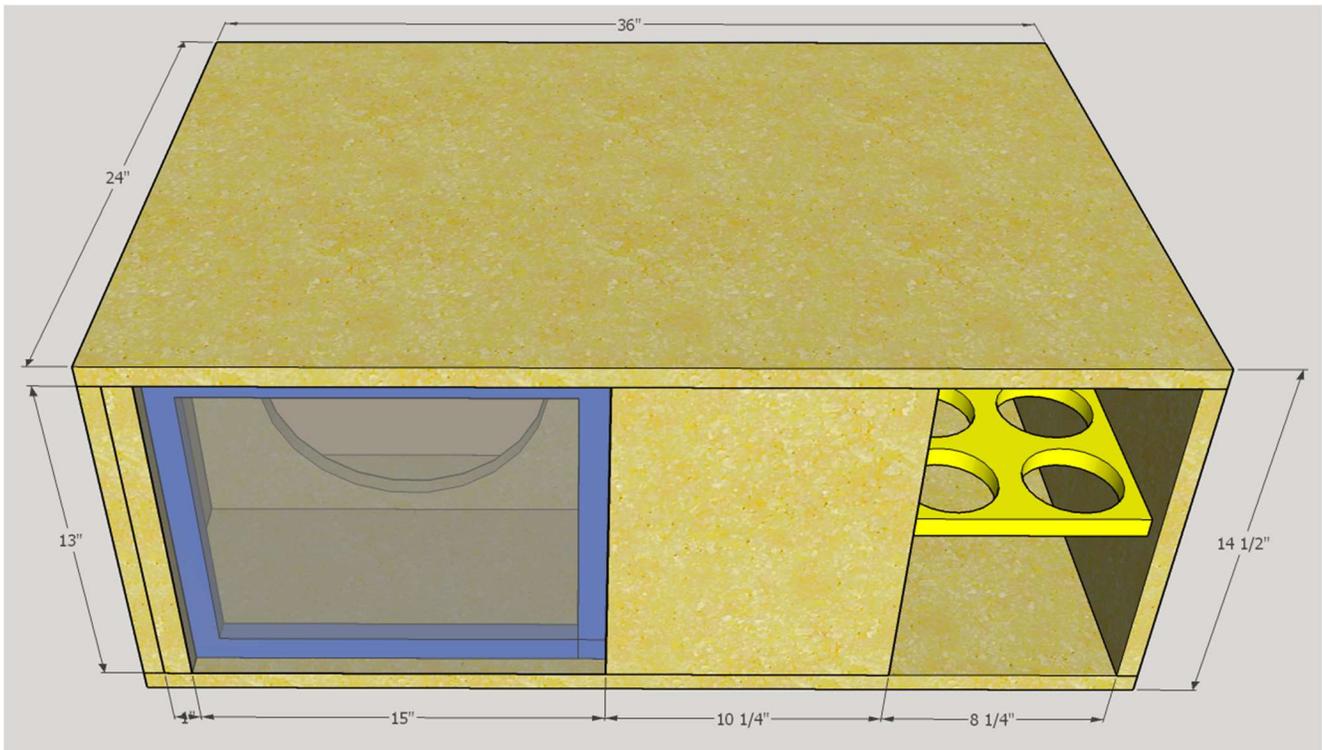
Buildup 3



Buildup 4



Completed Dimensions



X-Ray View

