



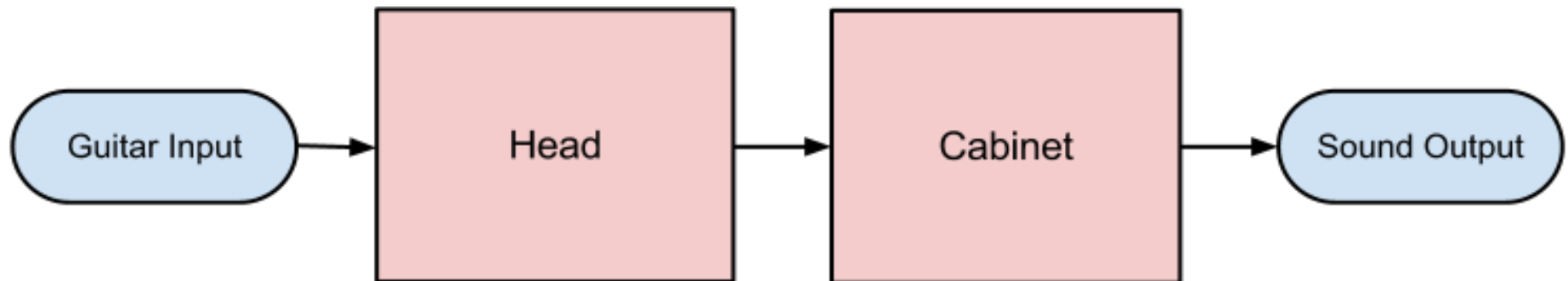
# ECE 445 Project Presentation

Project 7  
Thomas Satrom  
Jeremy Pessin

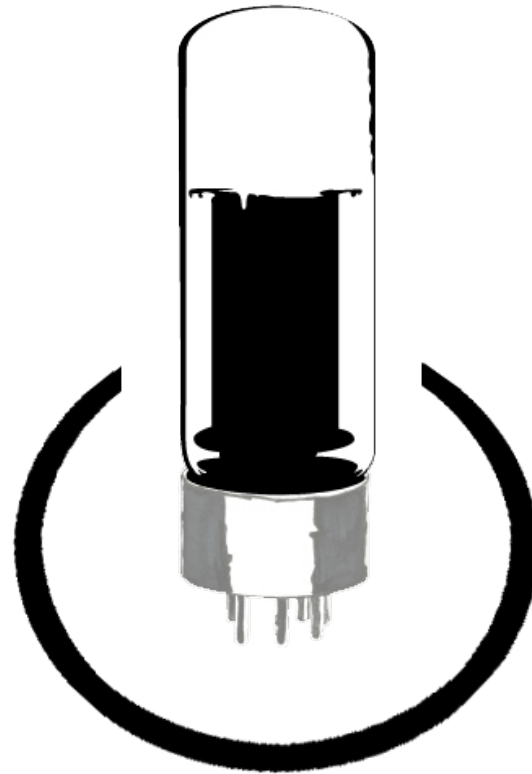
# Objective

- 50W guitar amplifier
  - Contains entire 1W tube amplifier
  - Switching power supply & power amplifier
- 2 x 10" loudspeaker cabinet
  - Inward-tilted speakers for wide horizontal dispersion
  - Lightweight materials

# Project Design



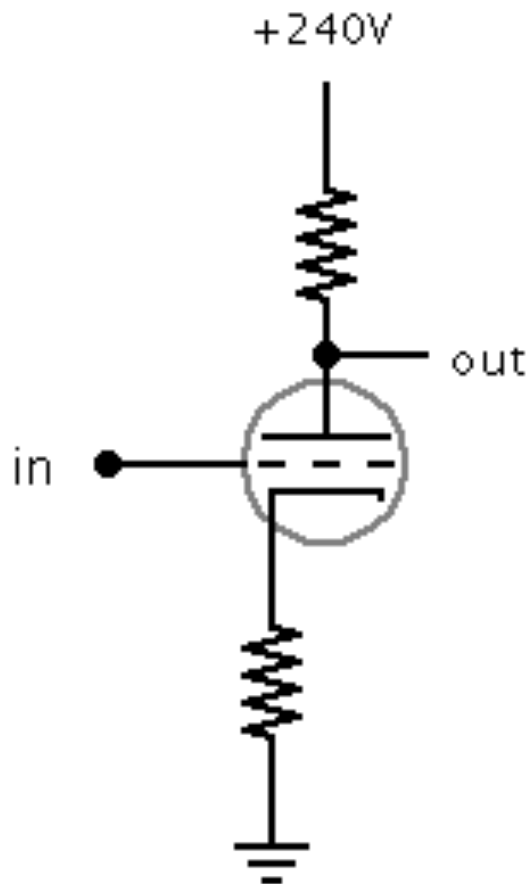
# Head Design



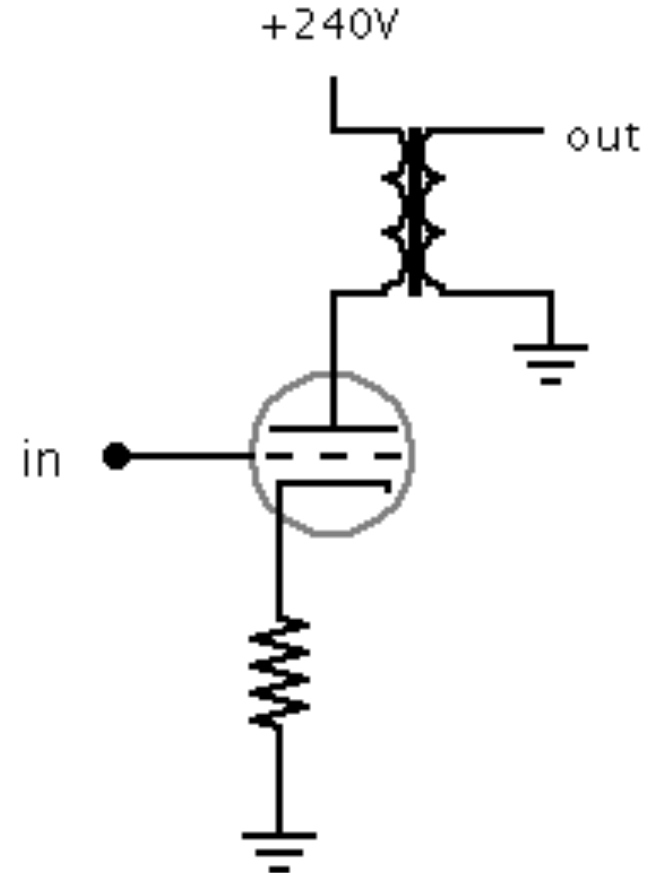
Cyclops  
Man

# Tube Amplifier Stages

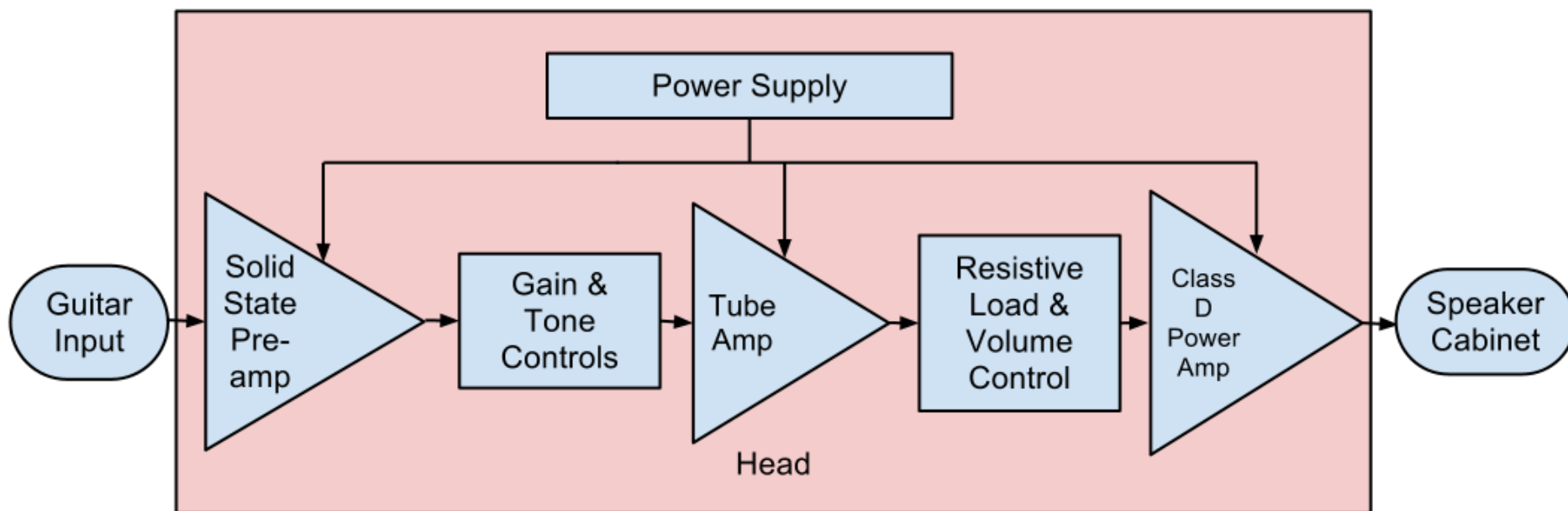
Tube Preamp Stage



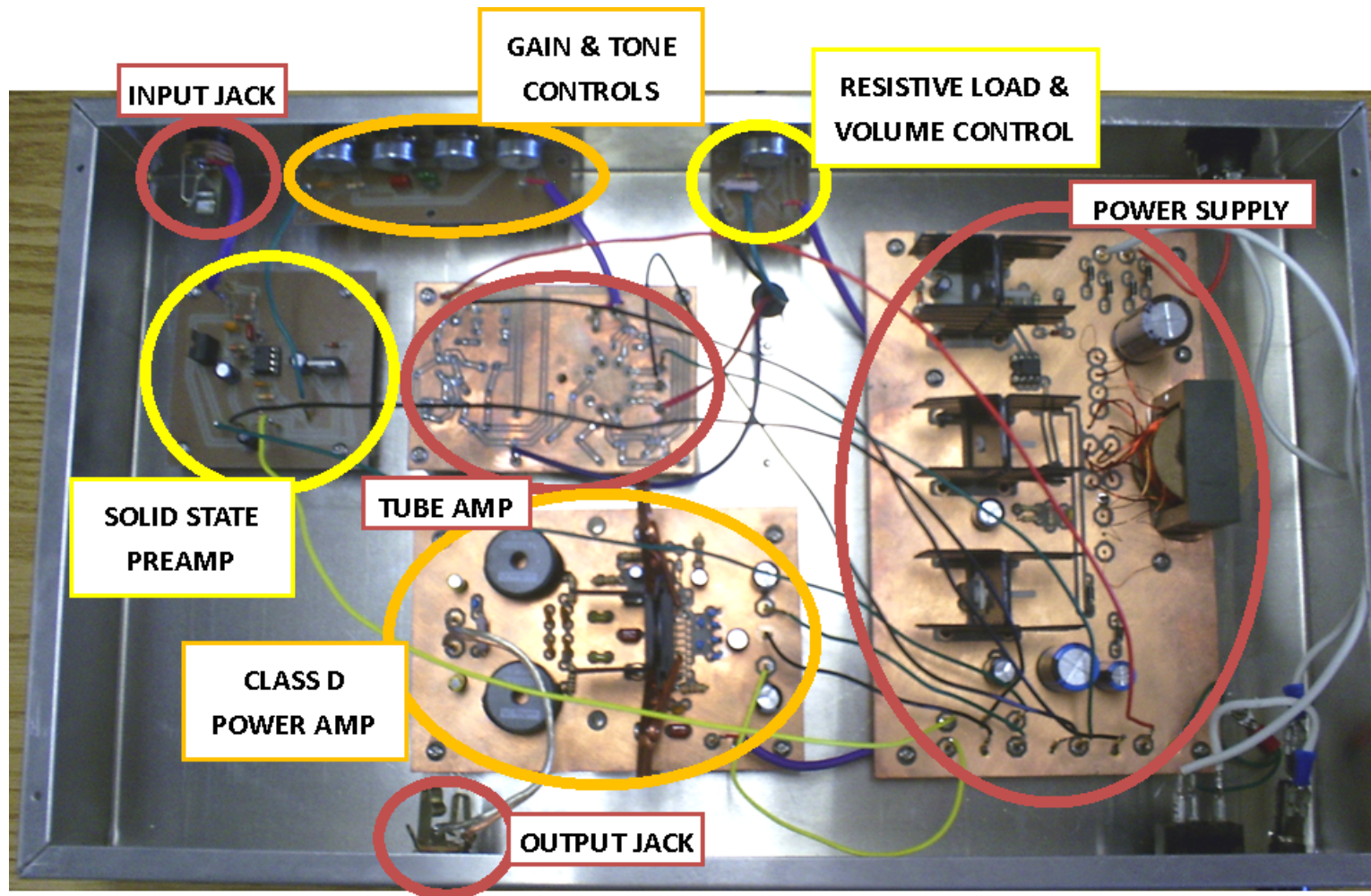
Tube Power Amp Stage



# Head Design



# Head Construction





# Head Results

## Power Supply Results

Nominal Voltage	Acceptable Range	Actual Voltage	Acceptable Ripple (p-p)	Actual Ripple (p-p)
+250V	(+245V, +290V)	+272V	<15V	2.08V
+18V	(+13V, +30V)	+18.3V	<8V	0.26V
-18V	(-30V, -13V)	-20.8V	<8V	0.01V
+12.6V	(+11.3V, +13.9V)	+13.24V	<6V	1.63V



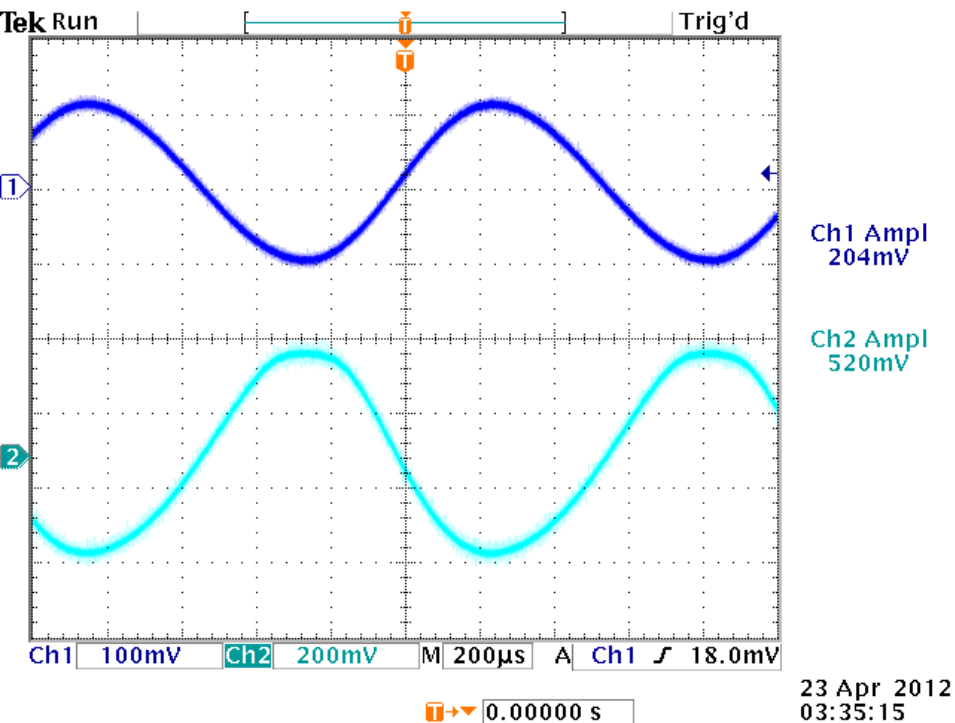
# Head Results

## Audio Path Results

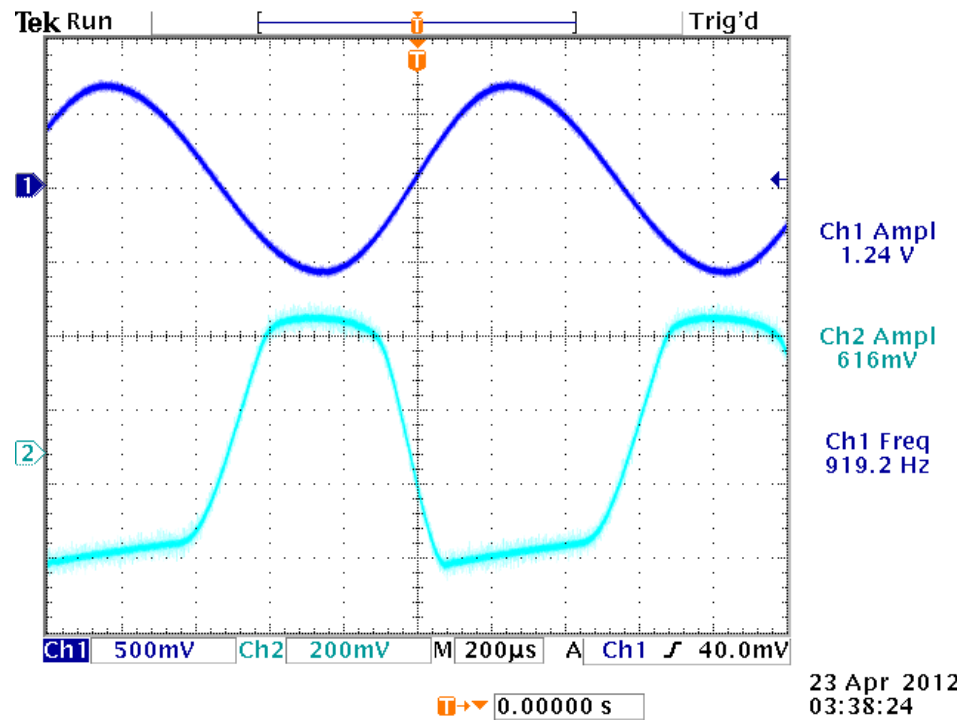
Stage	Expected Maximum Voltage Gain	Actual Maximum Voltage Gain
Solid State Preamp	34	34.4
Gain & Tone Controls	0.1	0.1
Tube Amp, Transformer, Resistive Load & Volume Control	10.7	<b>2.6</b>

# Head Results

## Tube Amplifier Input and Output Traces

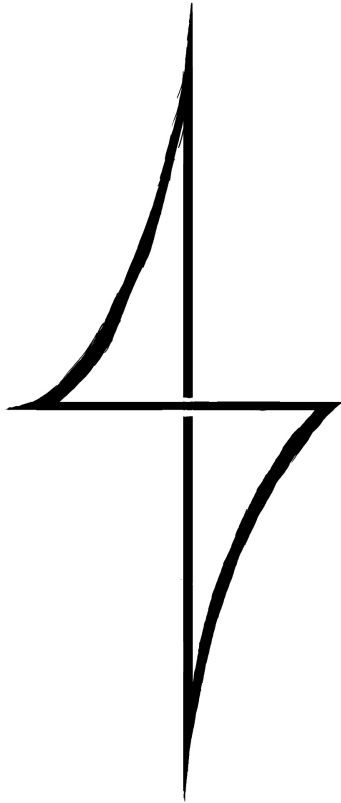


Onset of Distortion



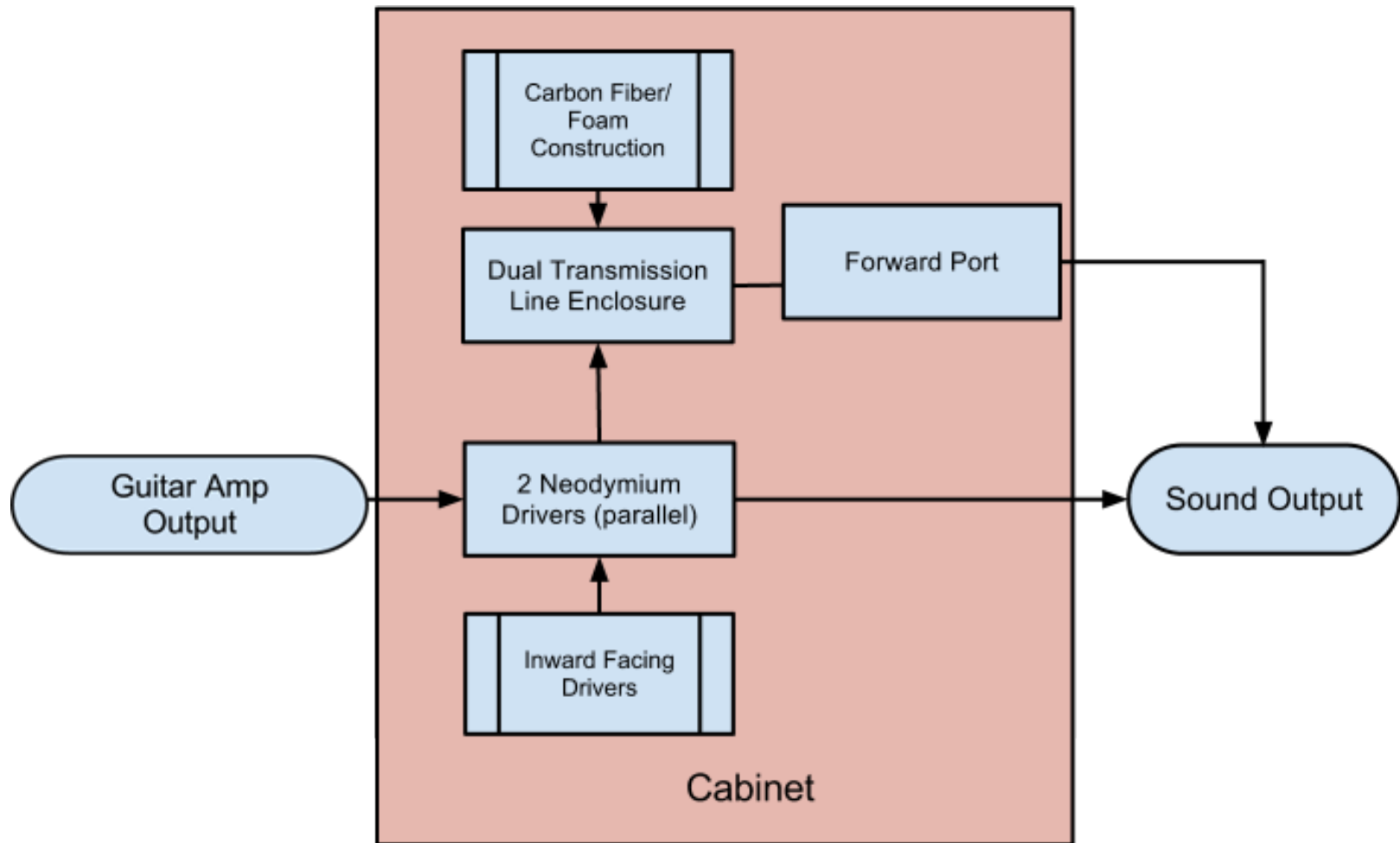
Significant Distortion

# Cabinet Design



Sætyr Music

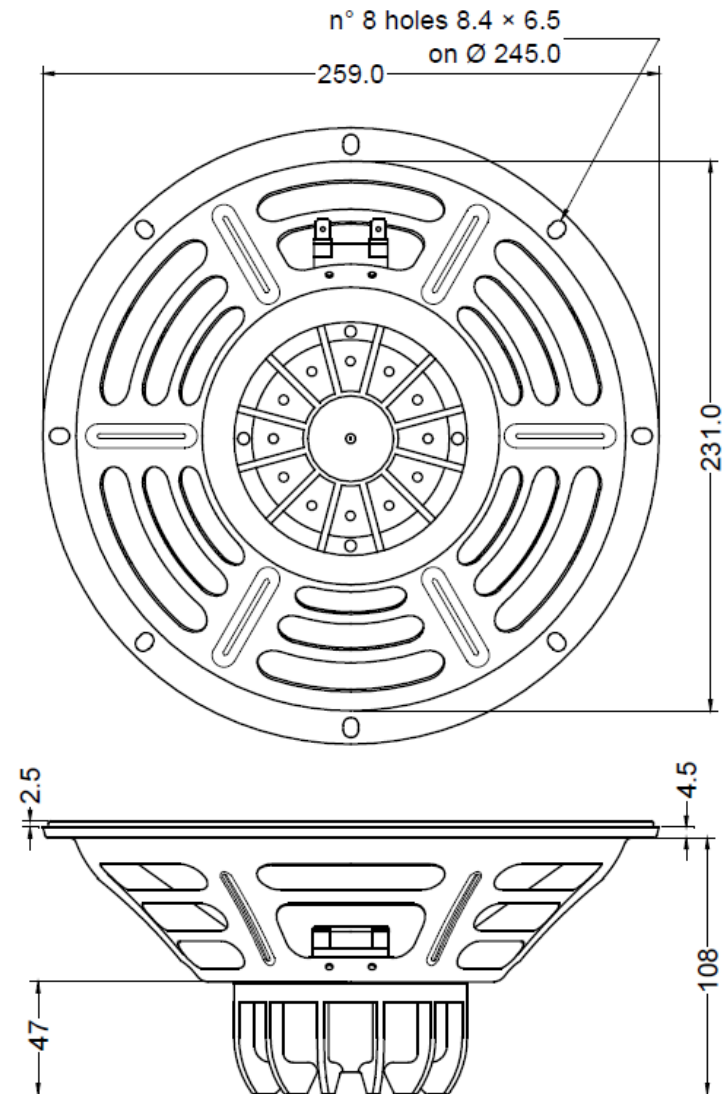




# Speaker Selection



Jensen Neo 10 -100





# Cabinet Materials

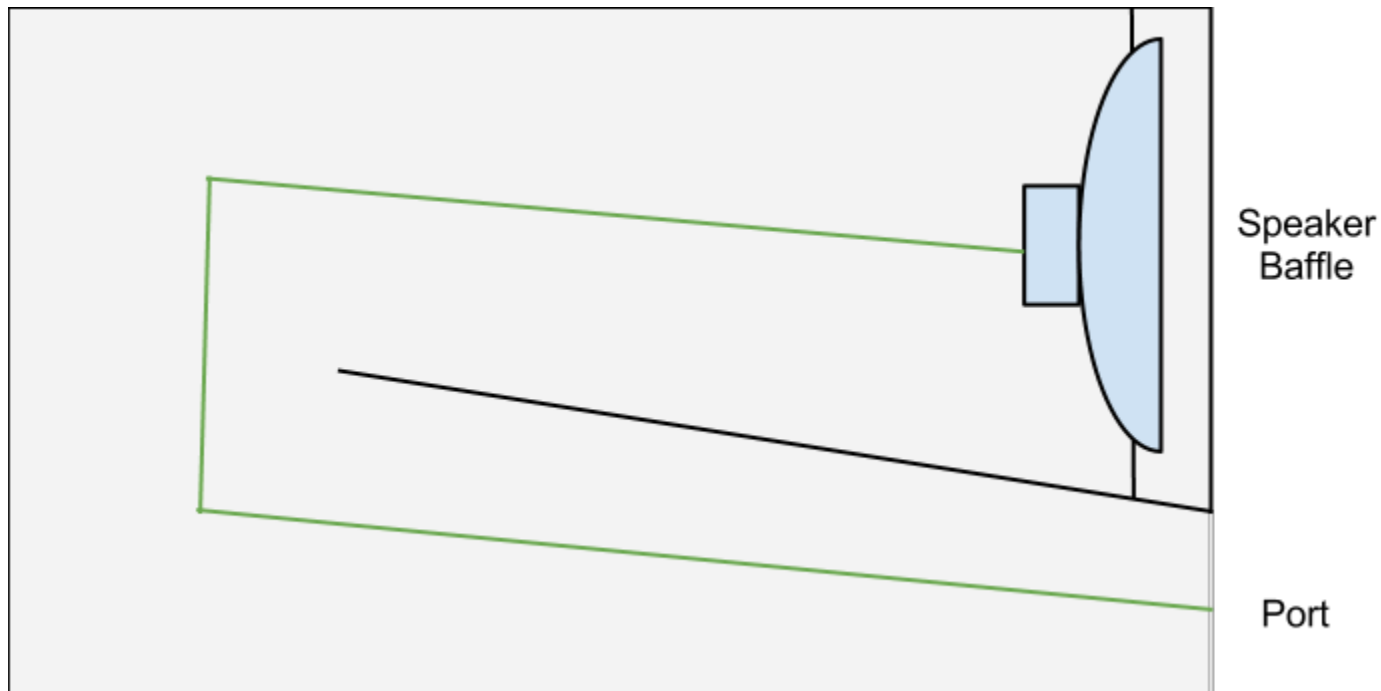
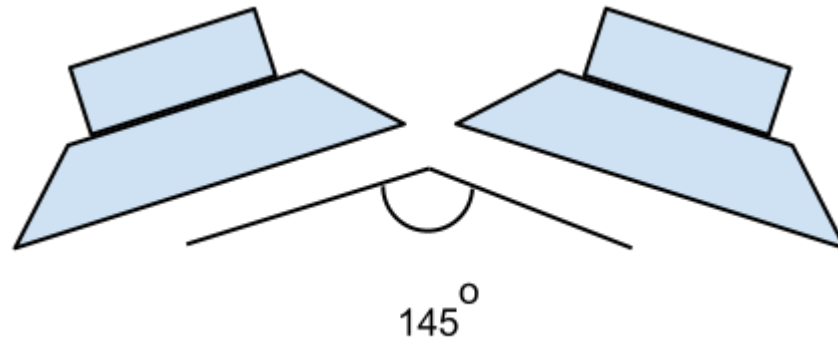


XPS sheet 3/4"



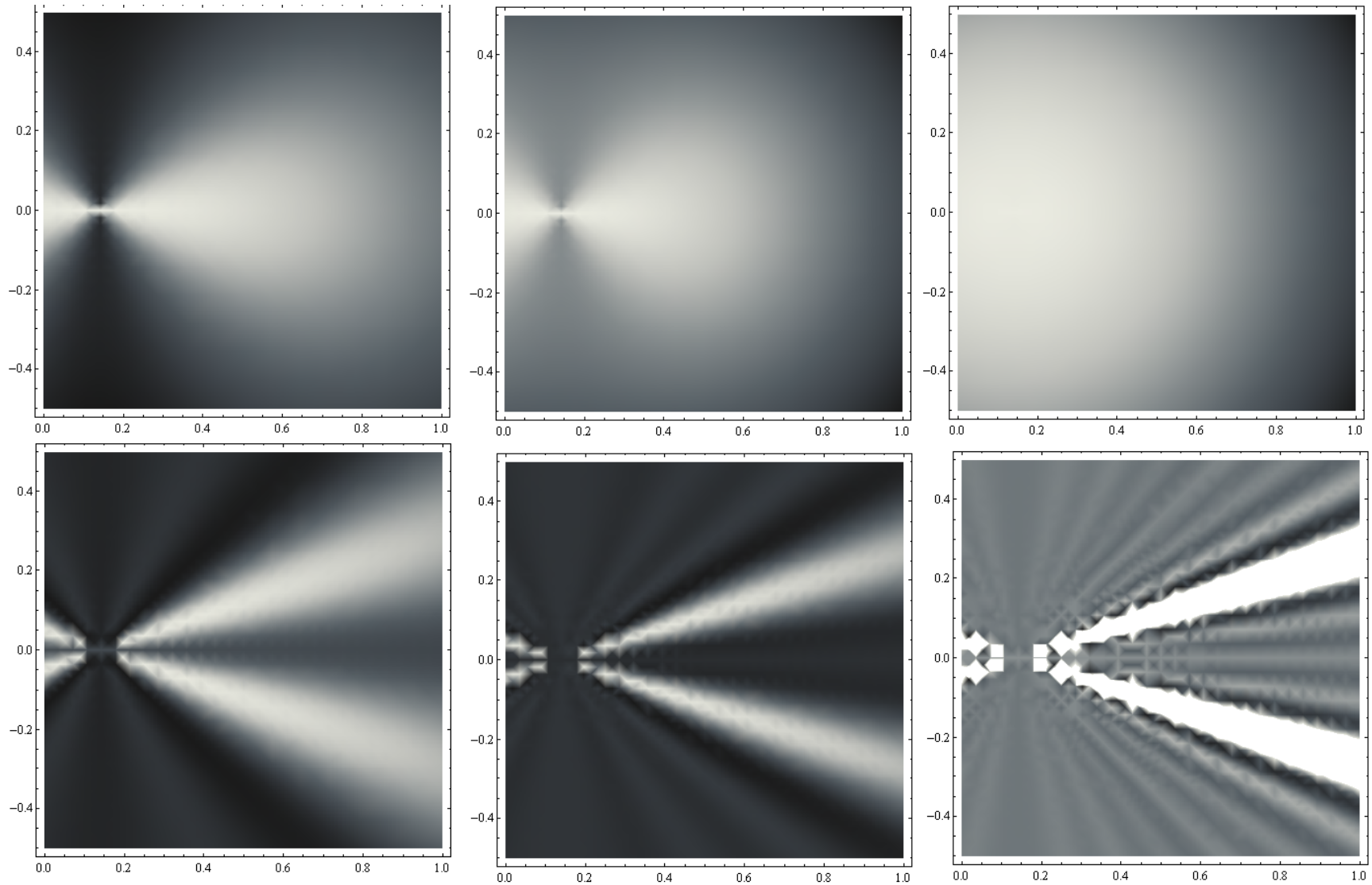
2k 2x2 twill Carbon Fiber

# Cabinet Configuration

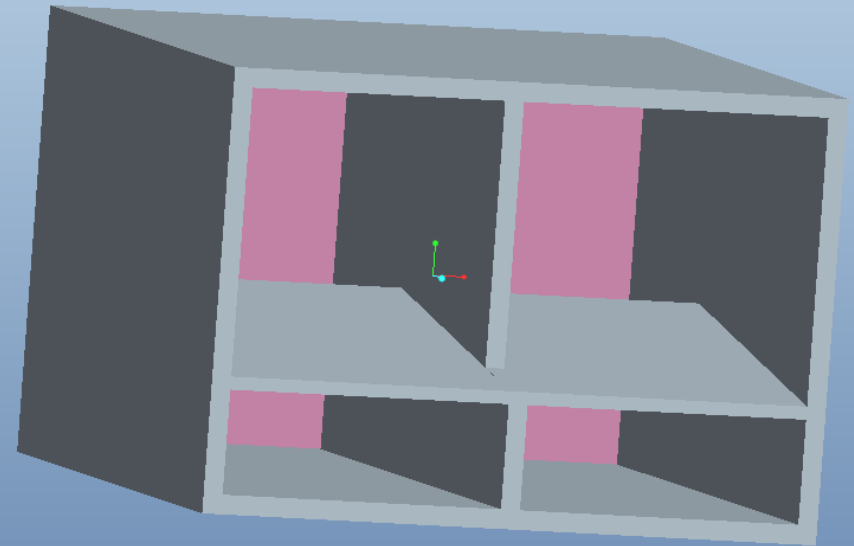
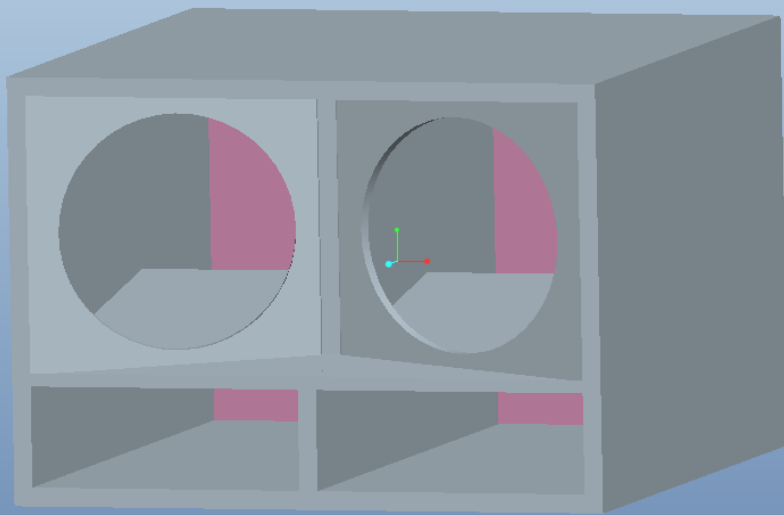




# Directivity Simulations



# CAD Model of Cabinet



# Initial Construction

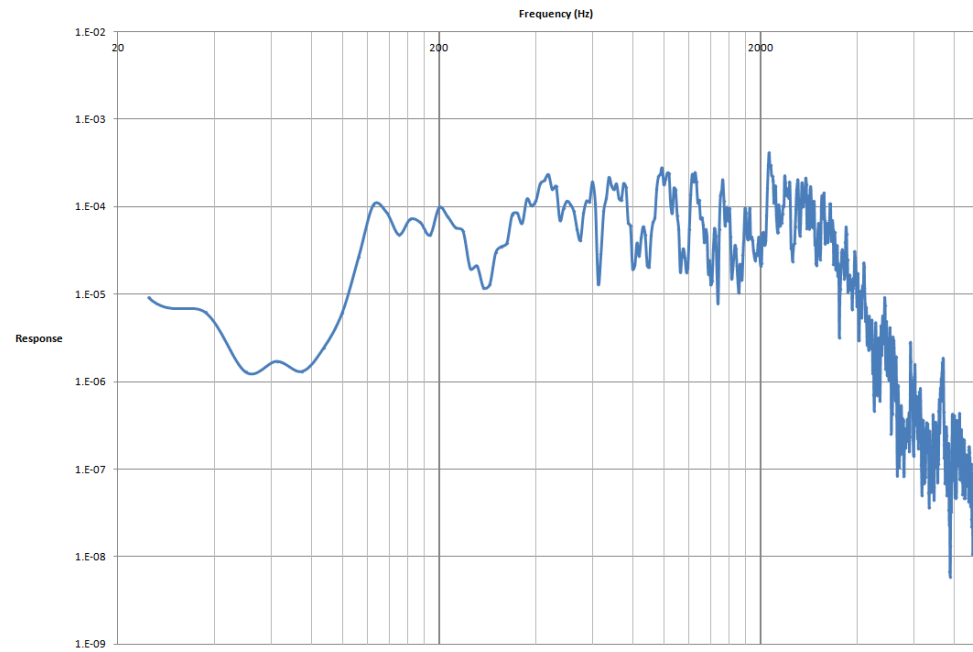




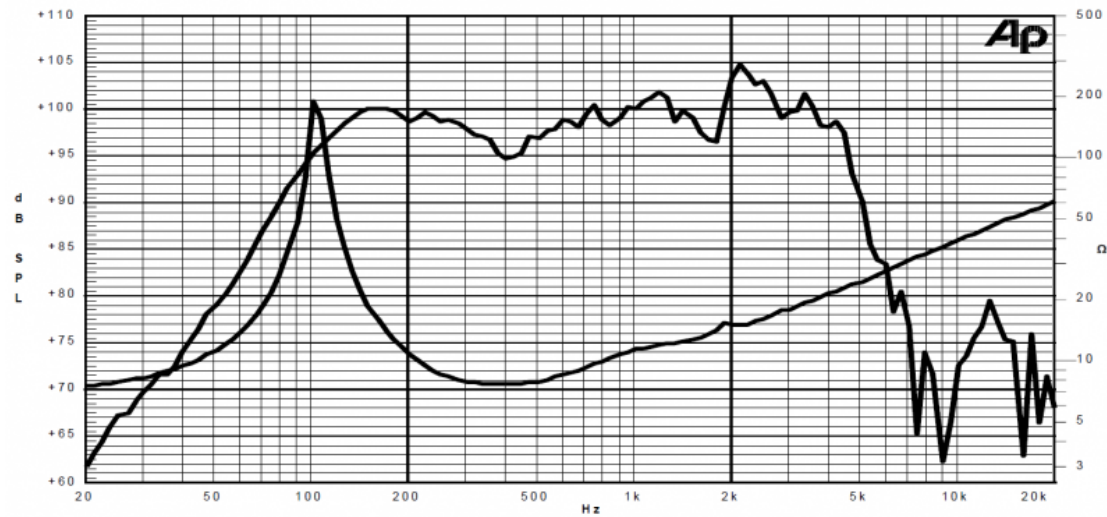
# Finalized Cabinet



Cabinet Frequency Response



Frequency Response on IEC Baffle (DIN 45575) @ 1 W, 1 m - Impedance





# Questions?