Part 2 : Detailed SPL Response Calculation

Calculation Includes :
Position of Driver and Port on the Baffle.
Baffle Step Defraction for the Driver and the Port.
Floor and Rear Wall Reflection for the Driver and the Port.

Geometry

Coordinate System :
Origin is the lower left corner of the front baffle
x = horizontal direction
y = vertical direction

The variables num_r, n_drv, and n_mth control the number of simple sources used in the calculations. Increasing each will improve accuracy at the expense of longer calculation times.
Increase each variable until final plotted SPL stops changing at which point the solution has converged.

Enclosure Geometry Input

width := 11.5·in	(Front Baffle Width)
height := 61.5·in	(Front Baffle Height)
depth := 8.5·in	(Depth of Enclosure)
dist := 100·m	(Front Baffle Distance from Rear Wall > Depth, to Eliminate Rear Wall use 100 m)
num_r := 9	(Number of Points per Quadrant of Baffle Edge)

Driver Geometry Input

x_{dc} := 5.75·in	(Driver Center x Coordinate)
y_{dc} := 30.75·in	(Driver Center y Coordinate)
n_dvr := 5	(Number of Points Across Diameter)

Port Geometry Input

x_{mc} := 5.75·in	(Port Center x Coordinate)
y_{mc} := 4.75·in	(Port Center y Coordinate)
n_mth := 4	(Number of Points Across Diameter)
Locate := 0	(0 = Front Baffle Port, 1 = Rear Baffle Port)

Listening Position (Default Location is at 1 m Distance Along the Driver's Axis)

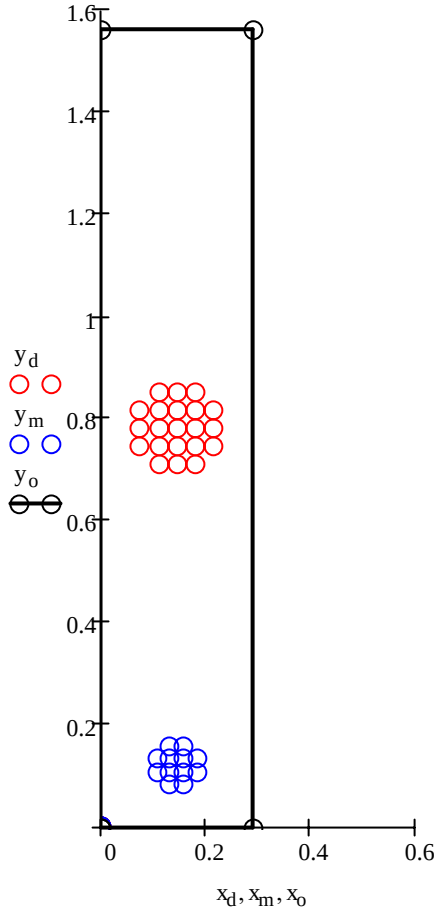
radius := 1·m	(Calculation Radius, Effective Radius is Greater if y_p is Changed from Default)
θ := 0·deg	(0 deg is along the Driver's Axis)
y_p := y_{dc}	(Default Height is equal to Driver Height)

Floor Condition

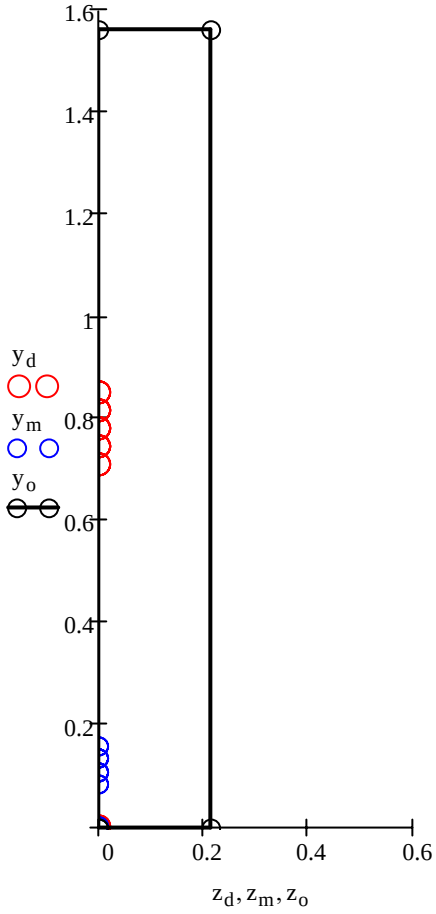
Reflect := 1	(0 = hardwood or concrete, 1 = carpeted)

Circular Driver and Circular Mouth Simple Source Pattern with Baffle Edge Outline

Front View

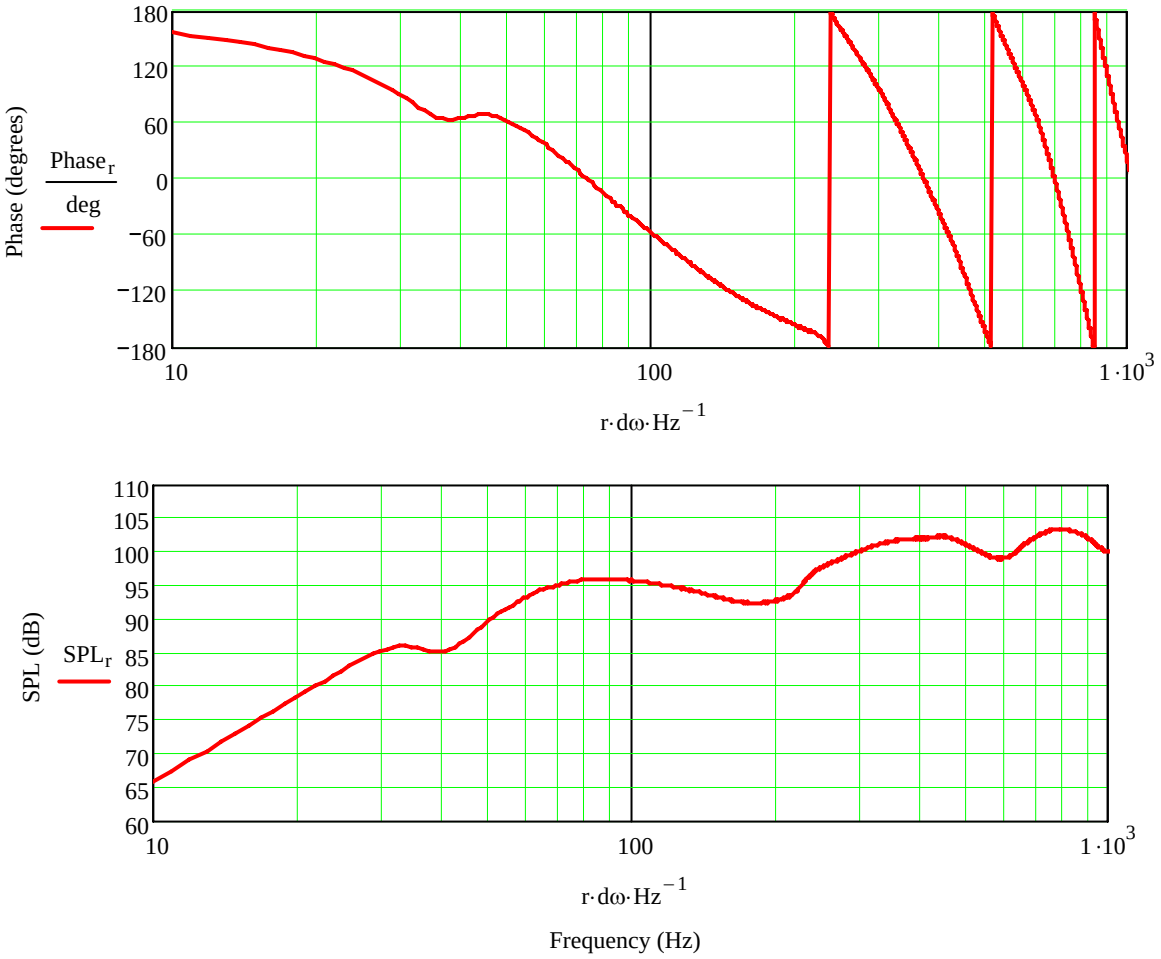


Side View

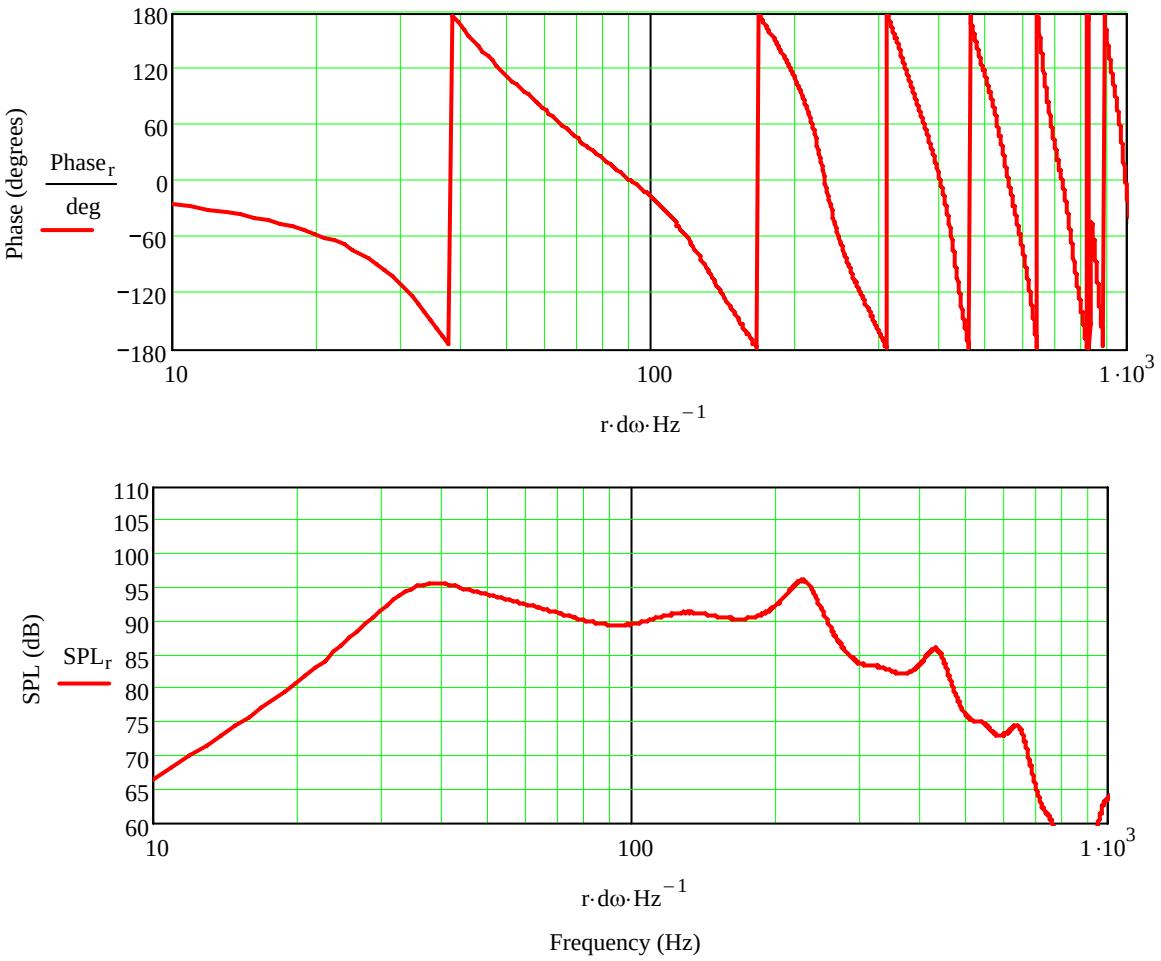


Red sources represent the driver.
Blue sources represent the port.
Black outline represents the baffle edge.
Origin is at the bottom front left corner of the enclosure.

Plotted Baffle Step and Reflection SPL Response for the Circular Driver Source



Plotted Baffle Step and Reflection SPL Response for the Circular Port Source



Plotted SPL Response for the System