Introduction

This guide documents the 3.15 cubic foot Passive Radiator Design. All material used is ¾" MDF or void-free plywood (Baltic birch). MDF is often the least expensive option with a 4x8 sheet costing about $20 at the local lumberyard. These designs are purposefully simple to cut and assemble. Feel free to add features like rounded edges, cabinet feet, amplifier cutout, and finish to fit your décor. A big part of the enjoyment of DIY Audio is the freedom to customize your project. You will find a whole new world of enjoyment in your music system when you have taken an active role in designing and building it.

Tools Required:

Like anything, if you have the right tool for a job, it is always much easier. The basic process of building a subwoofer is fairly simple. You cut the parts and glue and/or screw them together to form the finished design. At the very least, you have to have a table saw, or take the material to a local cabinet shop to have them cut to the correct dimensions. A router of some sort with a circle jig is the best tool for the large circular cuts. If you lack these tools, a trip to the local cabinet shop will be cheaper than buying them. If you plan to expand your DIY projects, buying a table saw and a router is part of the price of entry.

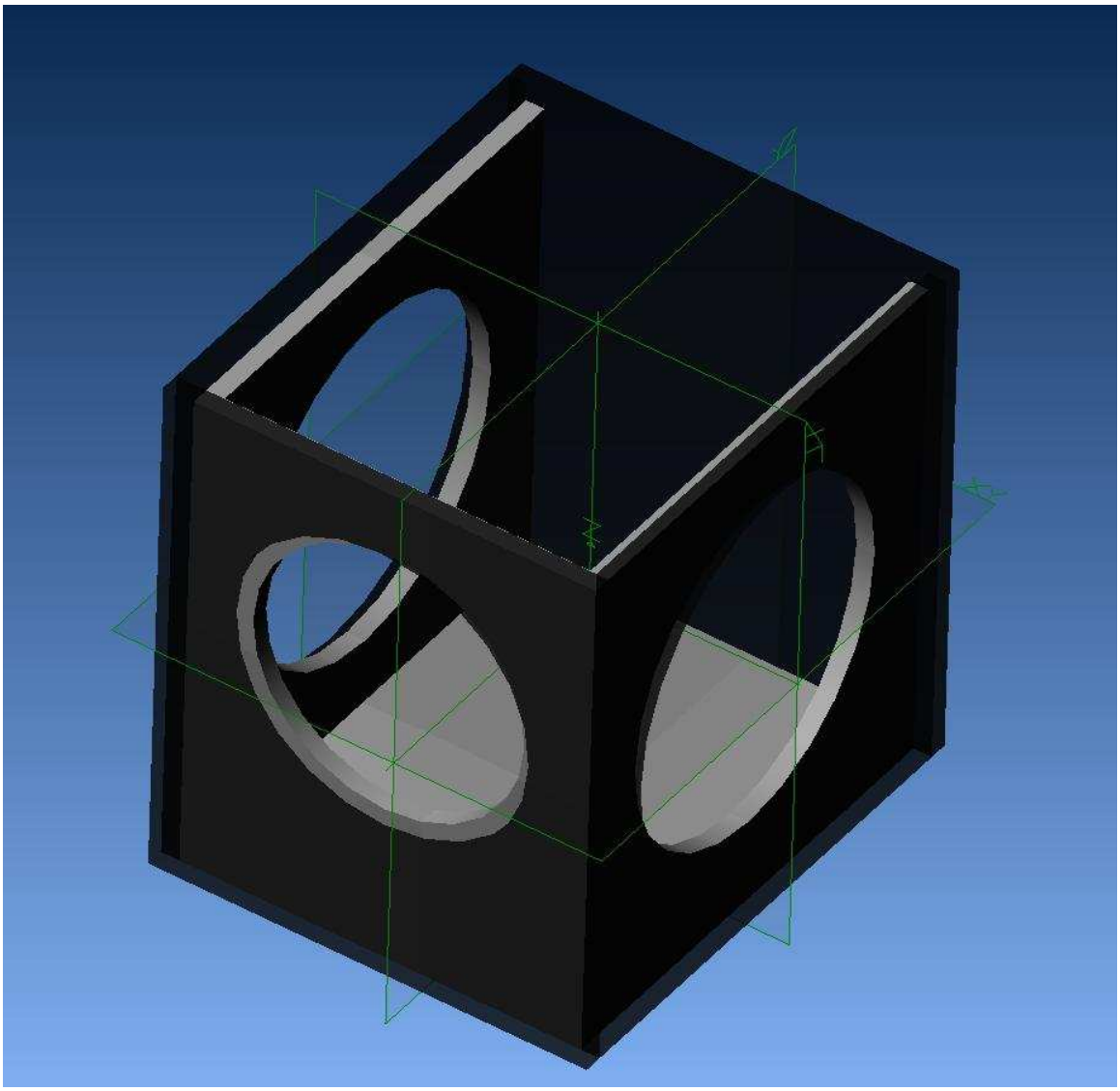
Assembly of the cut-parts is achievable in a number of ways. The builder can either glue and clamp the parts together, or screw and glue them together according to the drawing. The screwing method has the advantage of requiring fewer tools. The screws primarily just hold the assembly together while the glue dries. We recommend standard wood glue, either Tite-Bond, or Elmers Wood Glue is available at any local Walmart or hardware store. There is no need for specialty glues. The basic inexpensive wood glue works the best.

The screw & glue method works best if the builder uses pilot holes for the MDF. MDF is prone to splitting on the ends so a small pilot hole for the wood screw will help prevent the edges from splitting. If the builder plans to leave the screws in place, they will need to be countersunk into the wood. Wood glue alone is more than sufficient for holding the assembly together so the screws may be extracted after the joint has fully cured. See your glue instructions for the proper set times.

These cabinets may be finished in a number of ways. The builder has plenty of options that include painting or wood veneer. One of the advantages of using Baltic Birch or a void-free plywood is that the builder can stain the cabinet without the need for a veneer. It can simplify the process and leaves exposed an interesting edge pattern.

Cabinet Design

Top off for visibility. The sides and front are two layers of ¾" MDF. The rebate is formed by the different sized cuts hole cutouts required for each layer. That simplifies flush mounting the drivers and gives plenty of meat for driver mounting.

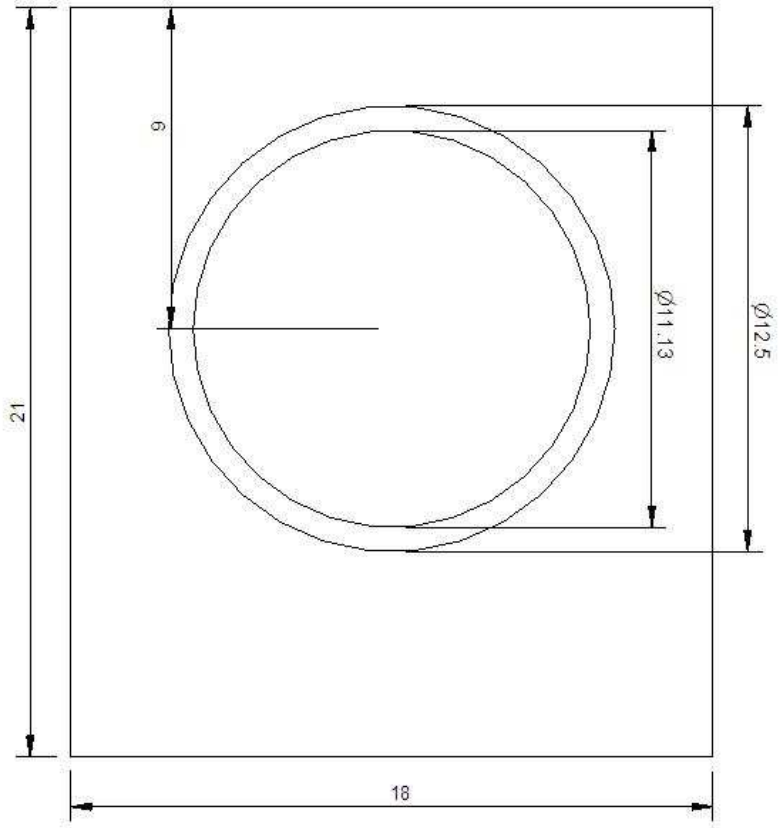


This is a simple assembly, with the Shiva-X active driver on the front, and two Passive Radiators on the sides. The Shiva-X could be placed on any of the sides of the enclosure.

The Shiva-X will function facing down just as well as it will facing forward. The Passive Radiators are another story. The mass applied to a passive radiator is many times what a typical active driver is designed with. This will cause the suspension to sag, and eventually fail. Passive Radiators should only be installed on one of the vertical walls of the cabinet (front, rear or sides). There are no grills shown in these drawings but they could easily be added to cover the drivers. Make sure that they are sufficient to account for the massive excursion of the Shiva-X & PR-15s. I'd use no thinner than 1.5" material.

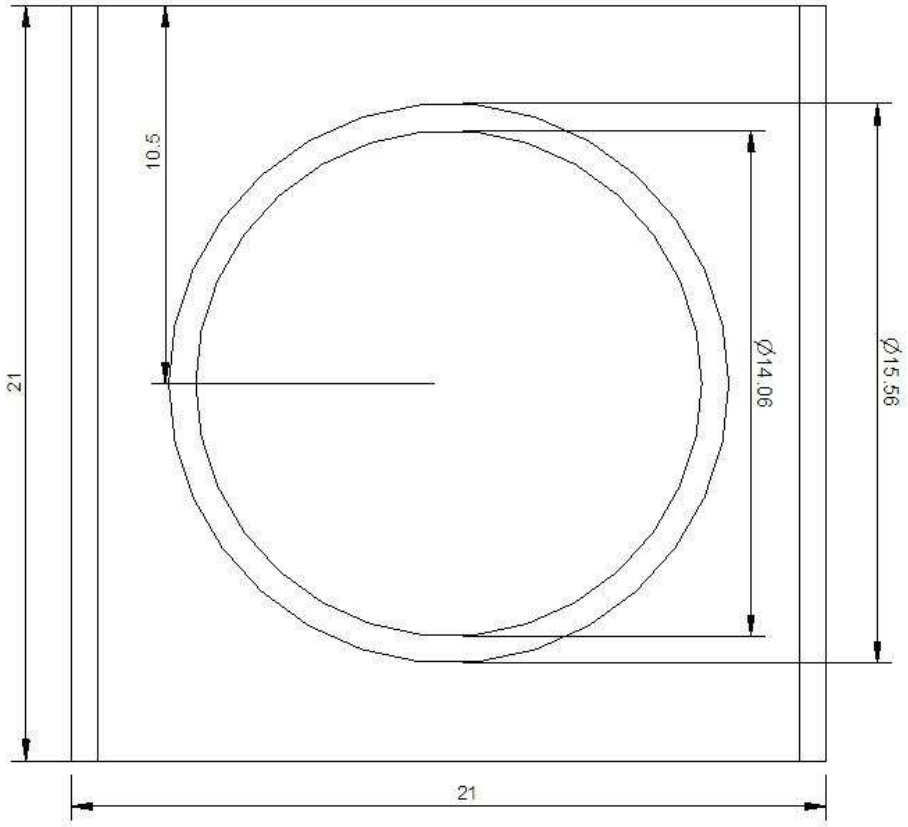
The following is a complete list of all cut-parts and dimensions. All material is cut from ¾" MDF or void-free plywood.

Assembly View from the front: The front two baffles are glued together to form a 1.5" front baffle.



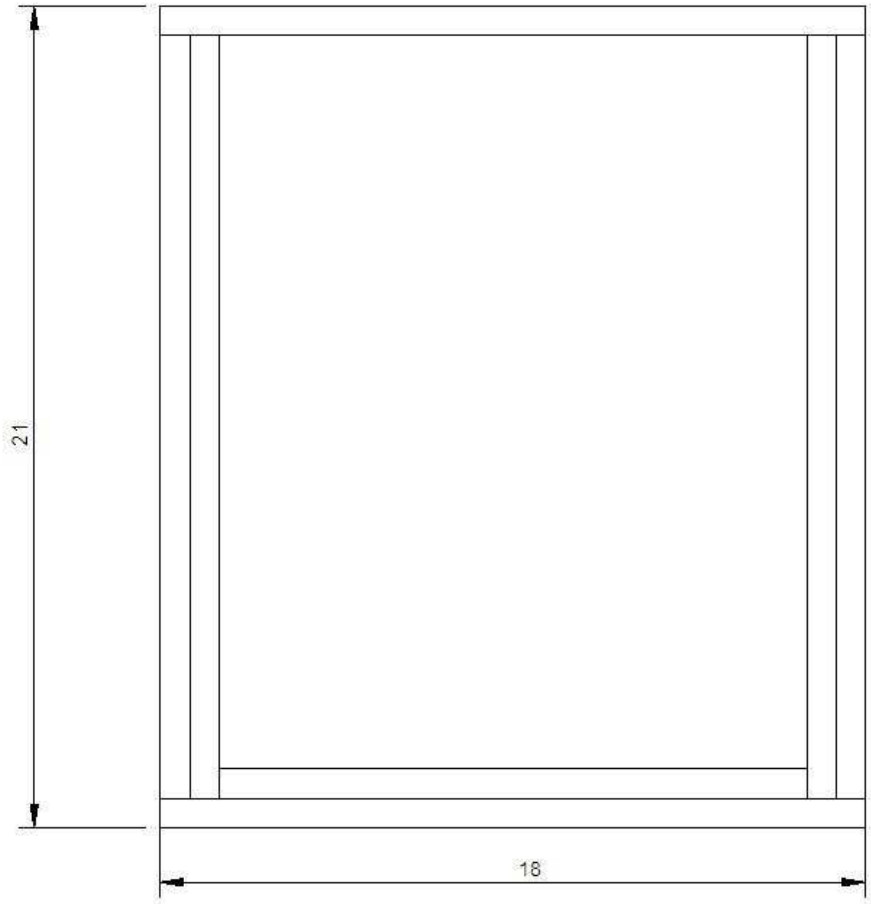
Front View

This is the **assembled** side view. The two layers of ¾" MDF form the rebate.



Side View

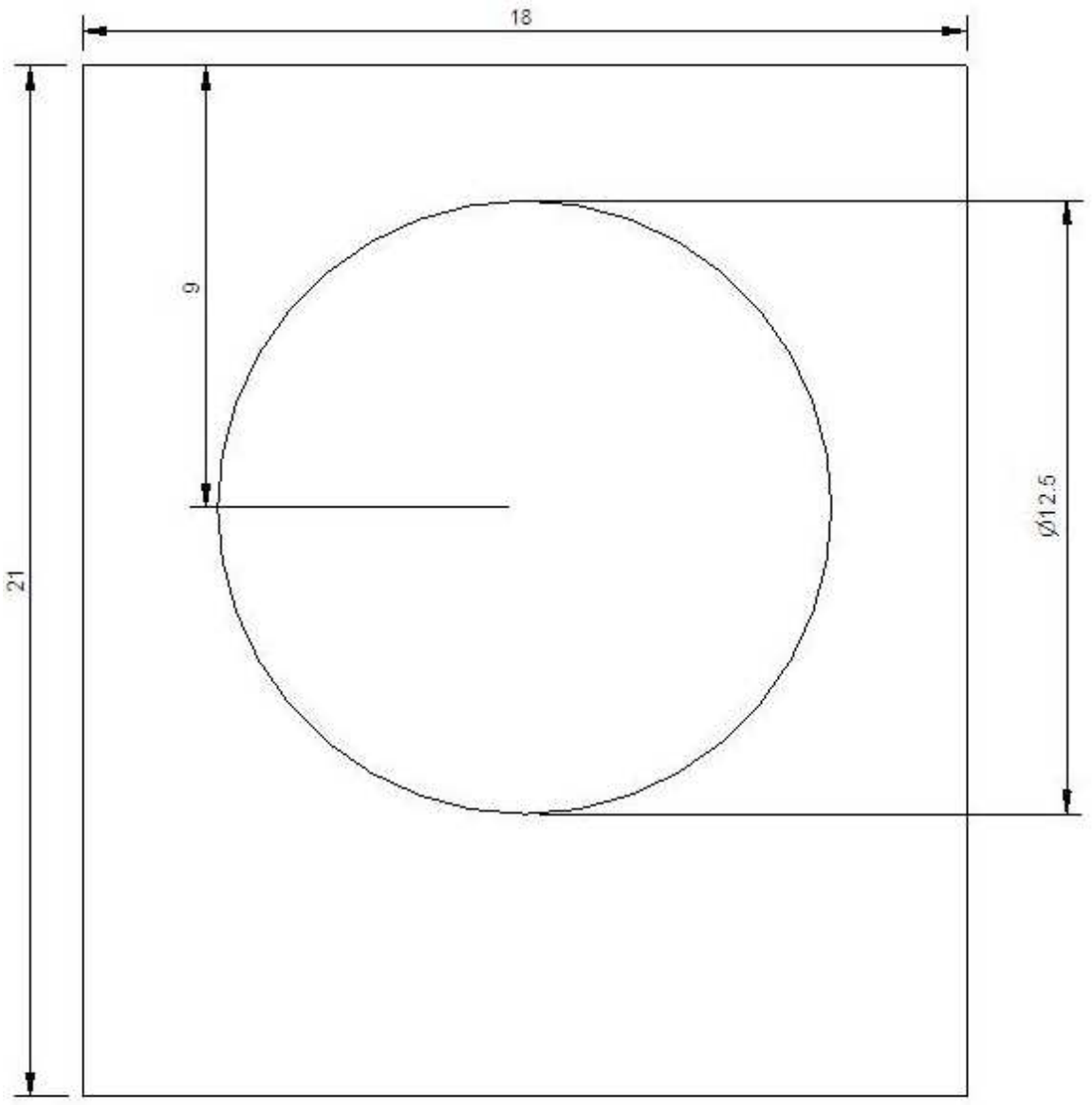
The top **assembly** view shows how the inner layers form both side & front baffle layers.



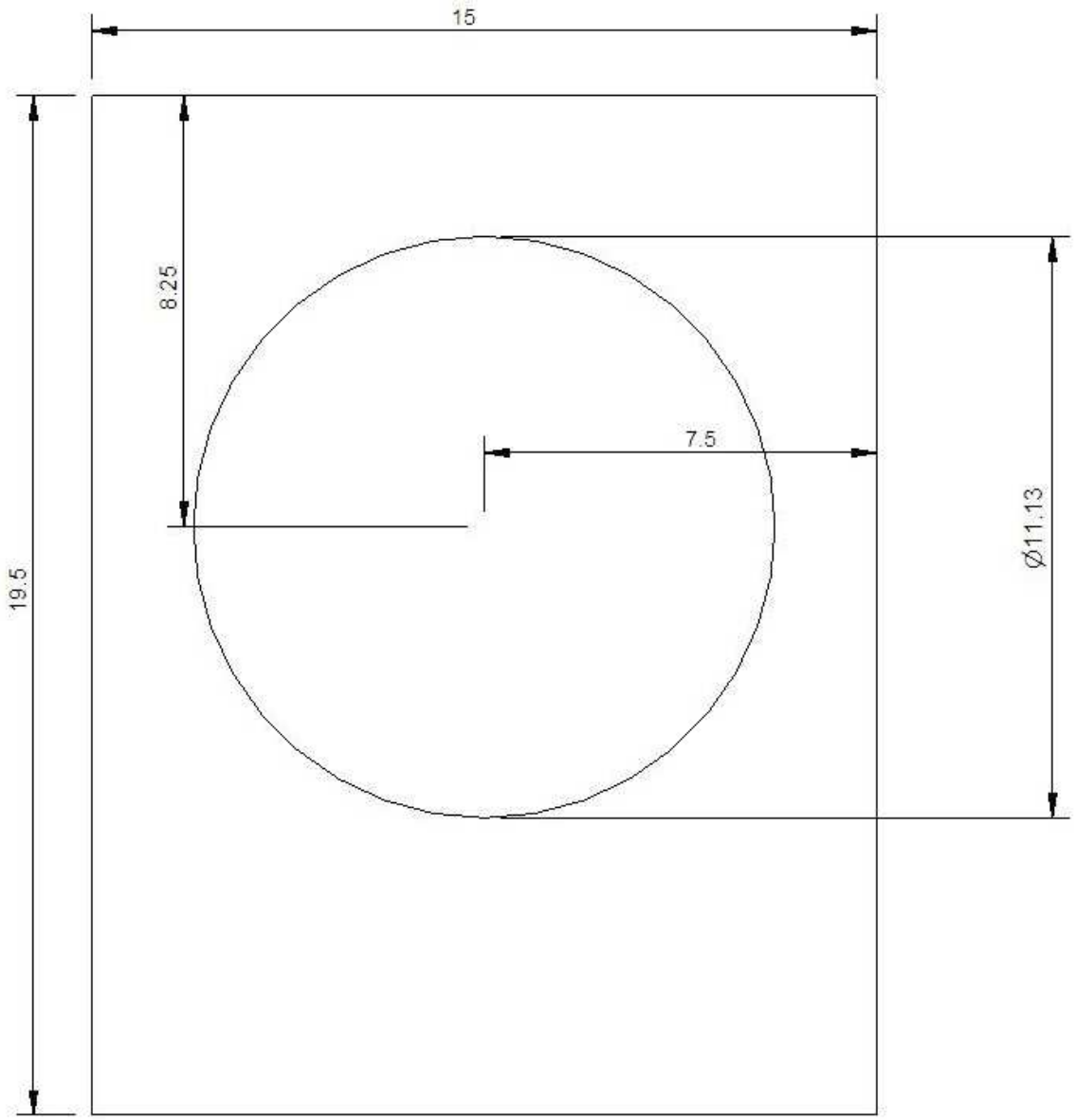
Top View

Drawings for all parts for the assembly as follows:

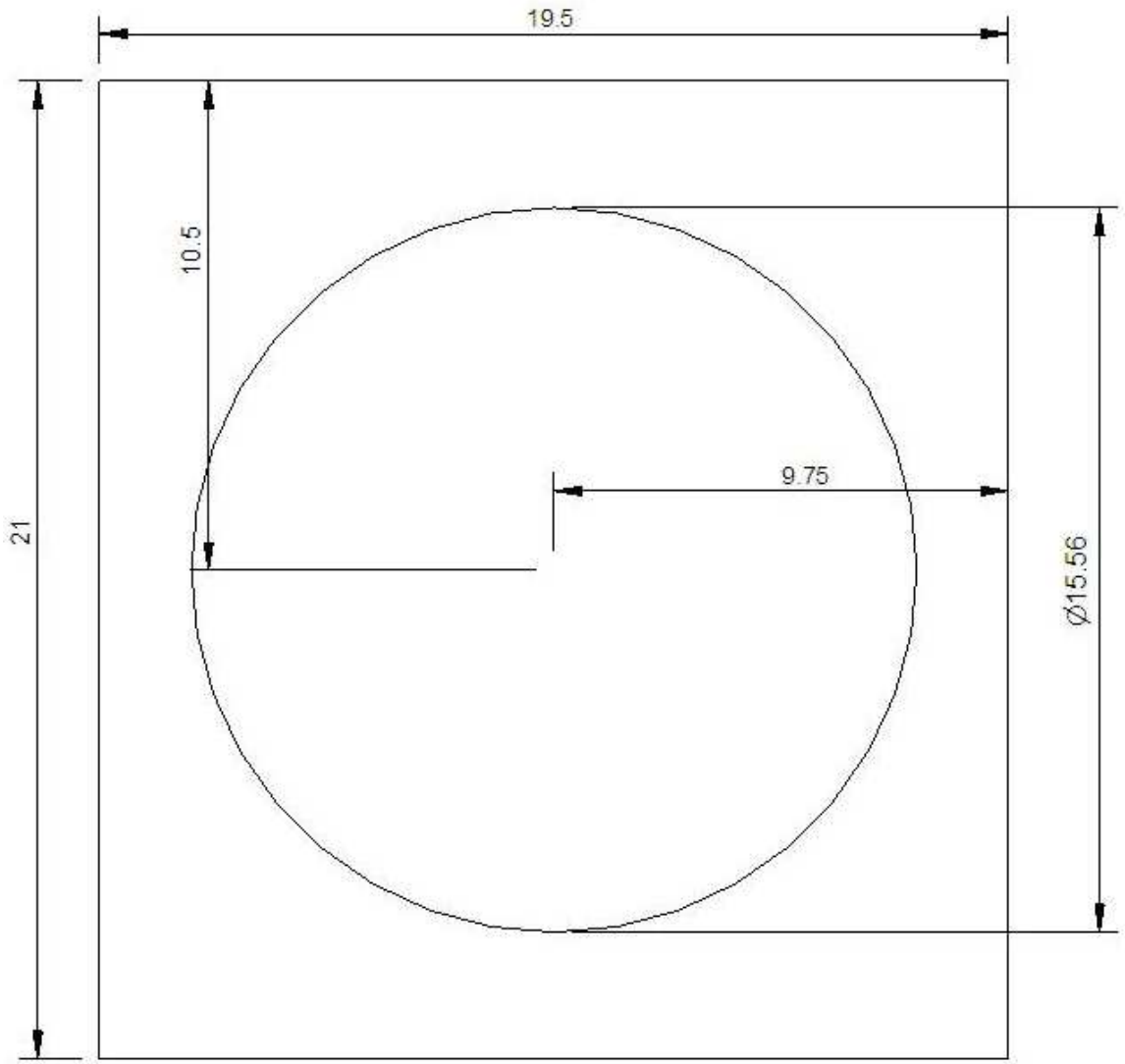
All ¾" Material



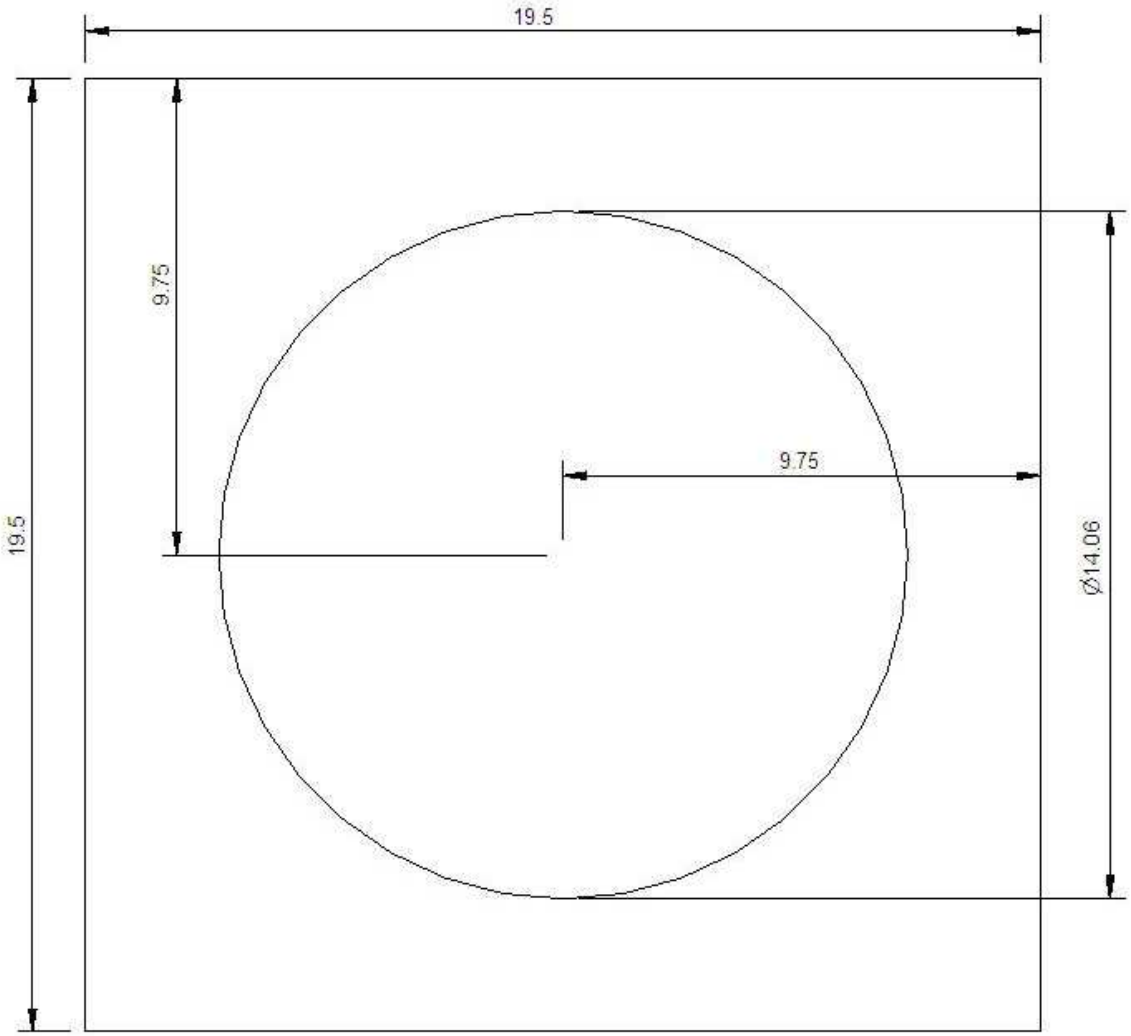
Front-Outer Baffle



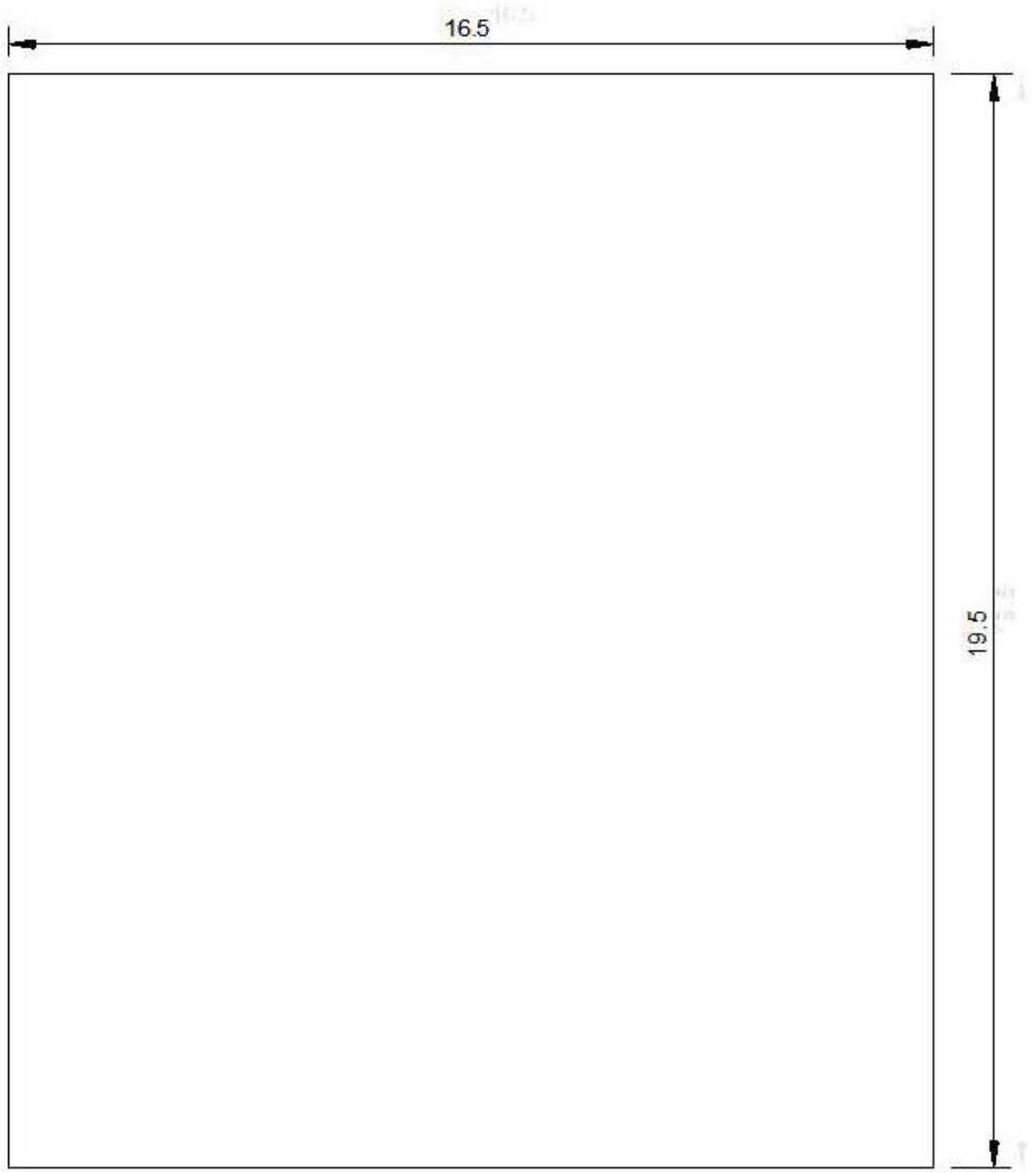
Front-Inner



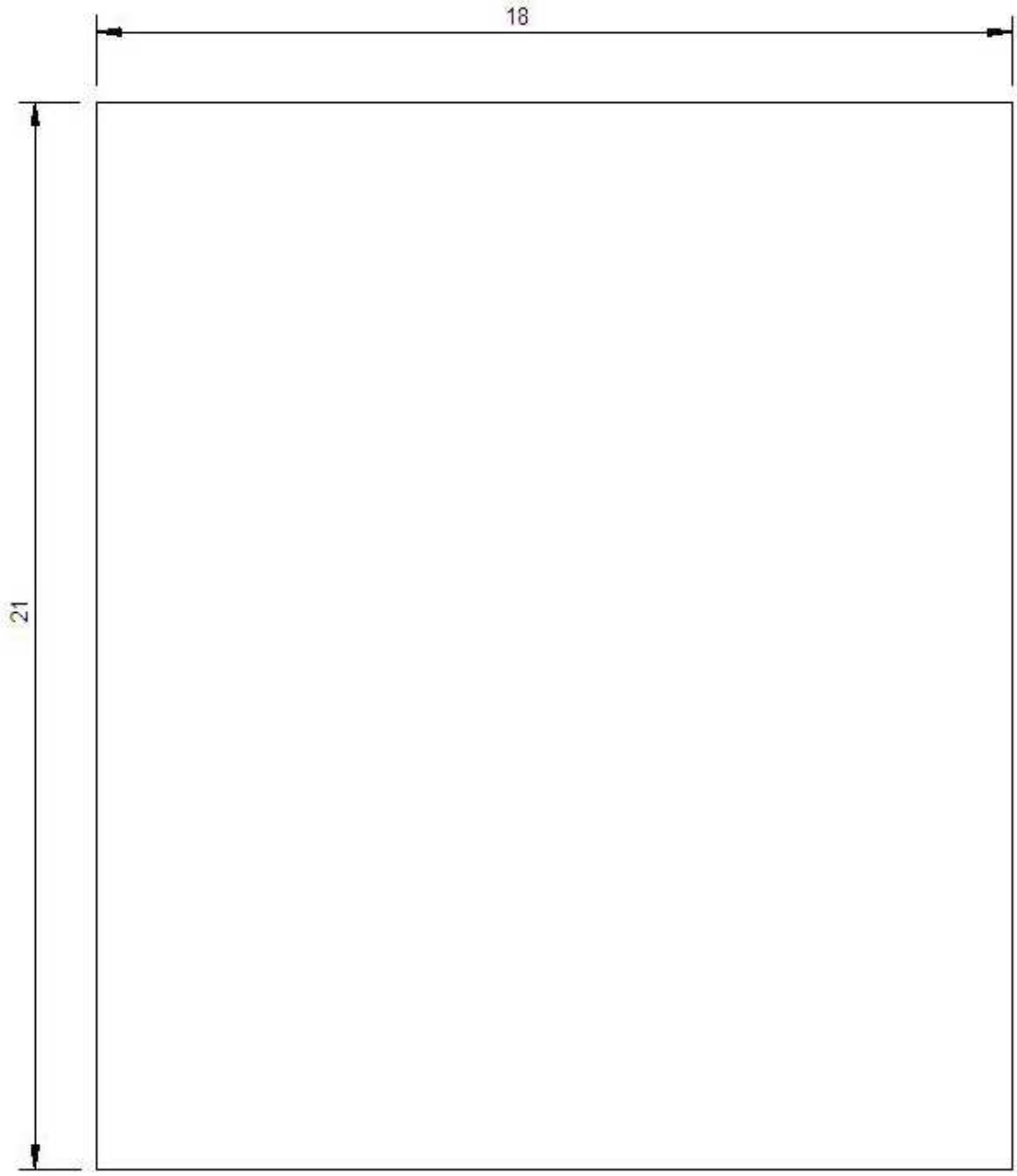
Side-Outer



Side-Inner



Top/Bottom



Disclaimer:

All measurements, and assembly are the responsibility of the builder. Do not build a box before having the drivers, and amplifier to measure to confirm dimensions for all cutouts and clearances. Never assume that parts will fit until you have physical parts to check and confirm. The builder is ultimately responsible for proper assembly.