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Cone Base Assembly

CAD files found under Cone folder in pr2_playpen/hardware

1. Cut 90” 80/20 piece into four 21.85” pieces. Then take 70” 80/20 piece and cut into three 22.00” pieces. Tap the four 21.85" with a M6 tap on the top. Construct as shown in Figure 1 using 2 hole brackets, M6X12 screws, and T-Nut Center Hole fasteners. Refer to assembly file for dimensions (base assembly.sldasm)

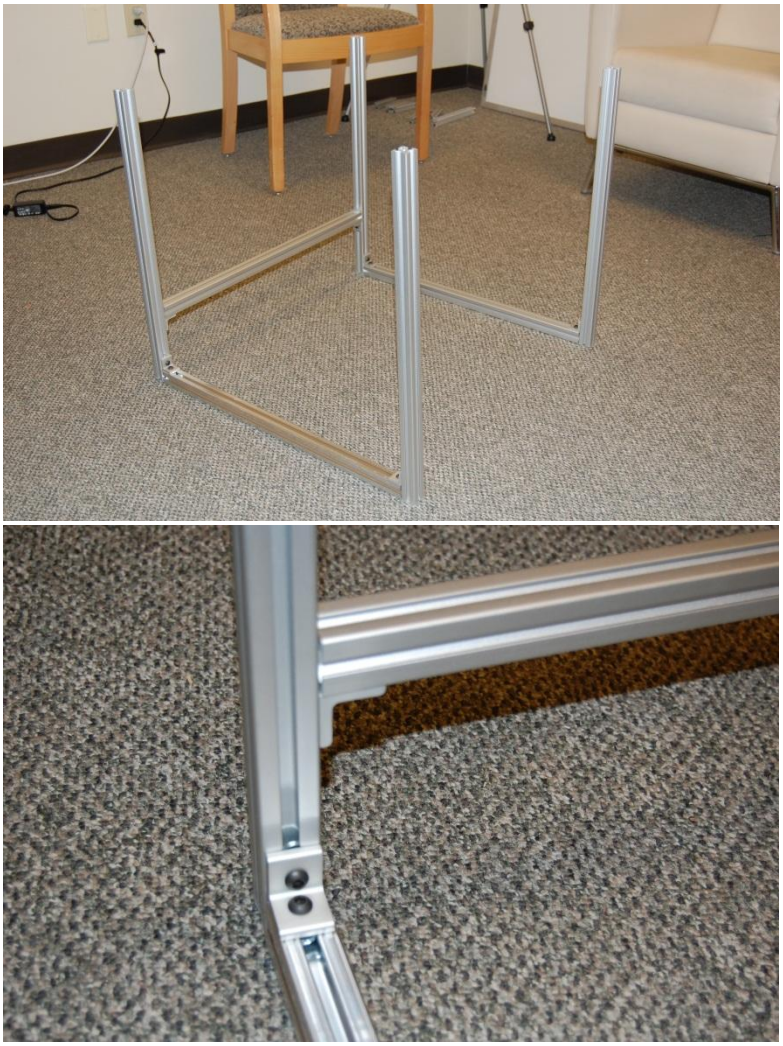
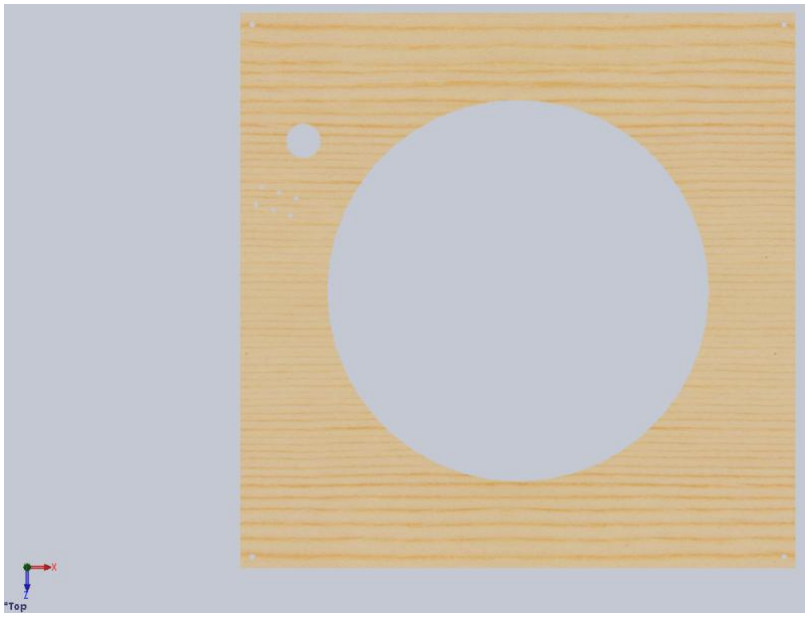


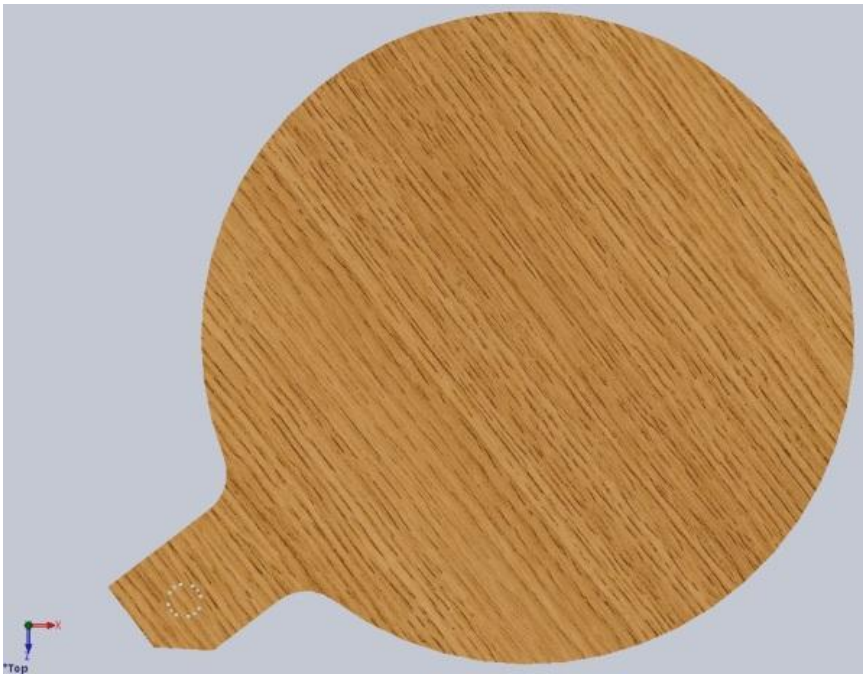
Figure 1 Initial base for playpen structure.

2. Cut the 24”x48” pressed wood piece into two pieces measuring 24”x24.” These will serve as the top and bottom pieces of the cone system.
3. Cut a 16.5” diameter through hole directly in the center of both top and bottom wood pieces.
4. Drill .24” diameter holes on all four corners of both the top and bottom wood pieces at 0.5” from each edge. This will be the mount point for the wood pieces to the 80/20 stand.

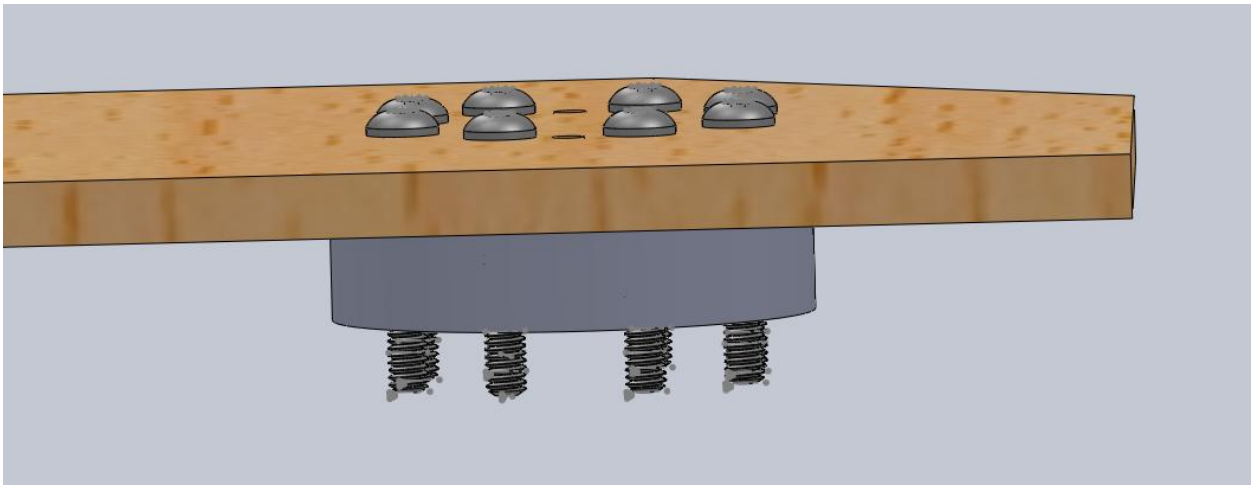
5. Take bottom pressed wood piece (both pieces should be identical so designate one to be the bottom) and cut out hole for the servo motor and drill holes to mount the MDF board hole cover. See wood_piece_bottom.sldprt for dimensions.



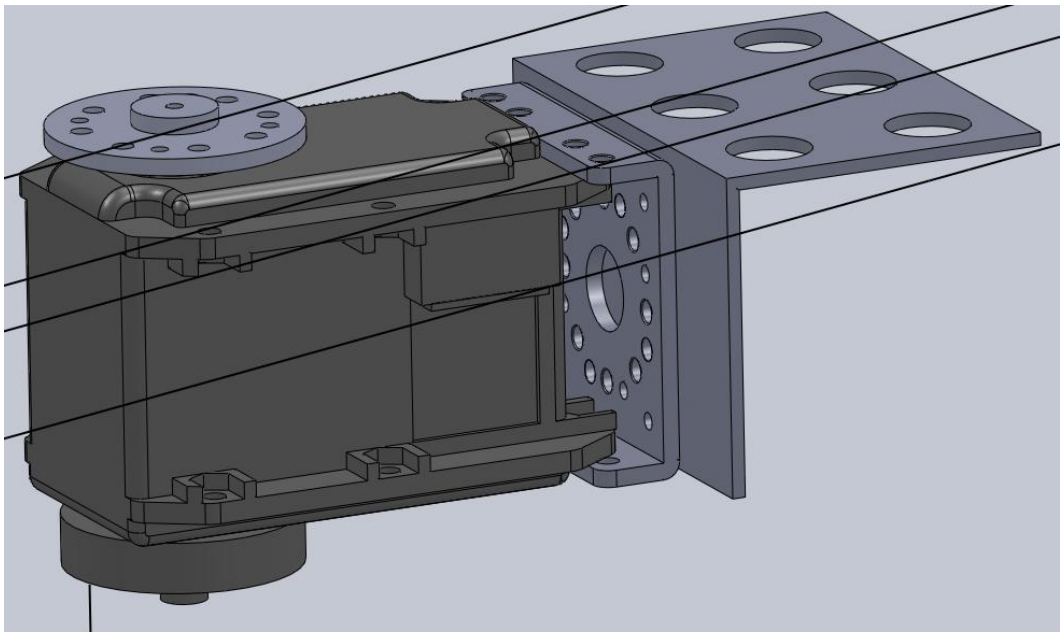
6. Take 1/8 inch MDF wood board 24"x48" and cut into shape seen below. Also, drill hole pattern to mount MDF board onto servo horn. See hole_cutaway.sldprt file for dimensions.



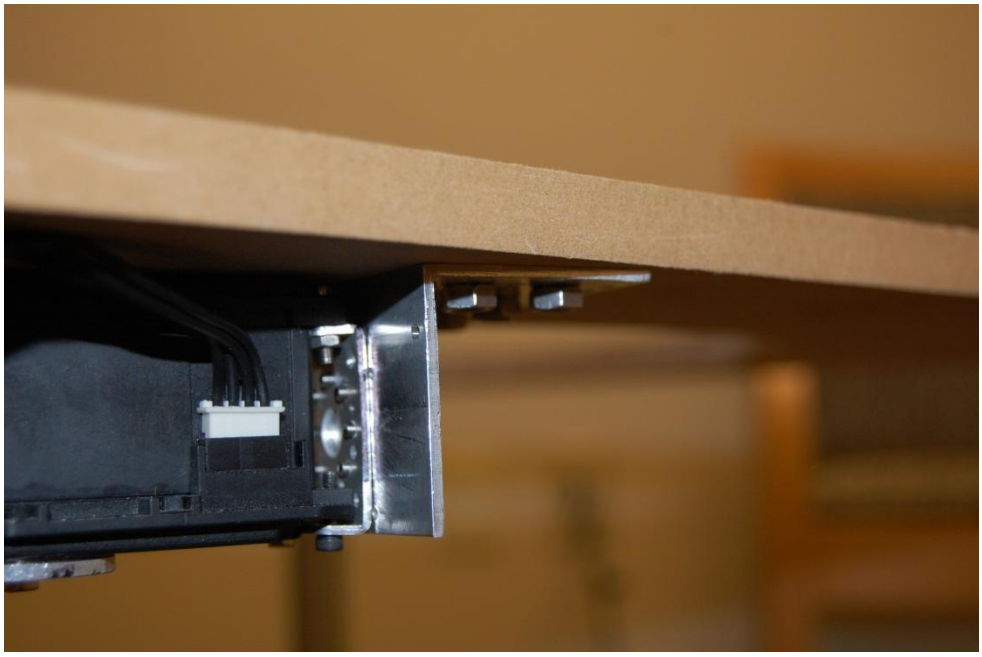
7. Take 8 screws M2.5 Size, 16mm length and insert into MDF hole cover (hole_ cutaway.sldprt) hole pattern drilled in step 6.
8. 3D print servo_space.sldprt. Then take servo spacer and mount onto bottom side of MDF hole cover (hole_ cutaway.sldprt) through screws as seen in picture below.

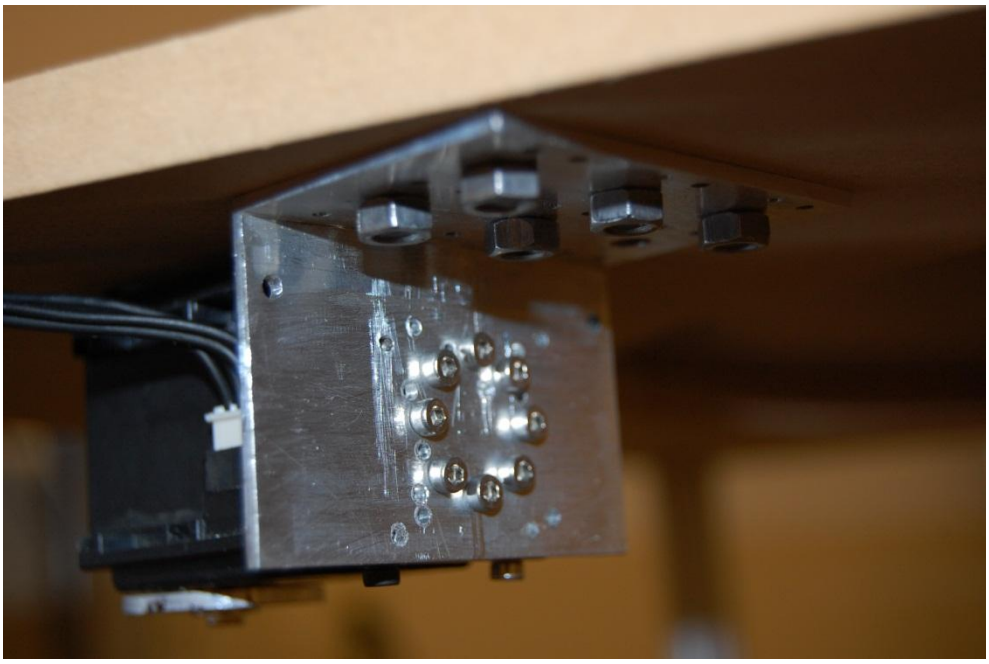


9. Set MDF hole cover aside. Take 90˚ aluminum stock and cut into servo bracket piece (servo_bracket.sldprt). This will serve as the bracket for the servo to attach to the bottom wood piece.
10. RX-64 Servo subassembly: Mount the OF-64S bracket to the servo motor. Then mount the OF-64S bracket to the servo bracket (servo_bracket.sldprt) as shown below. Screws are provided in servo kit purchased from manufacturer.

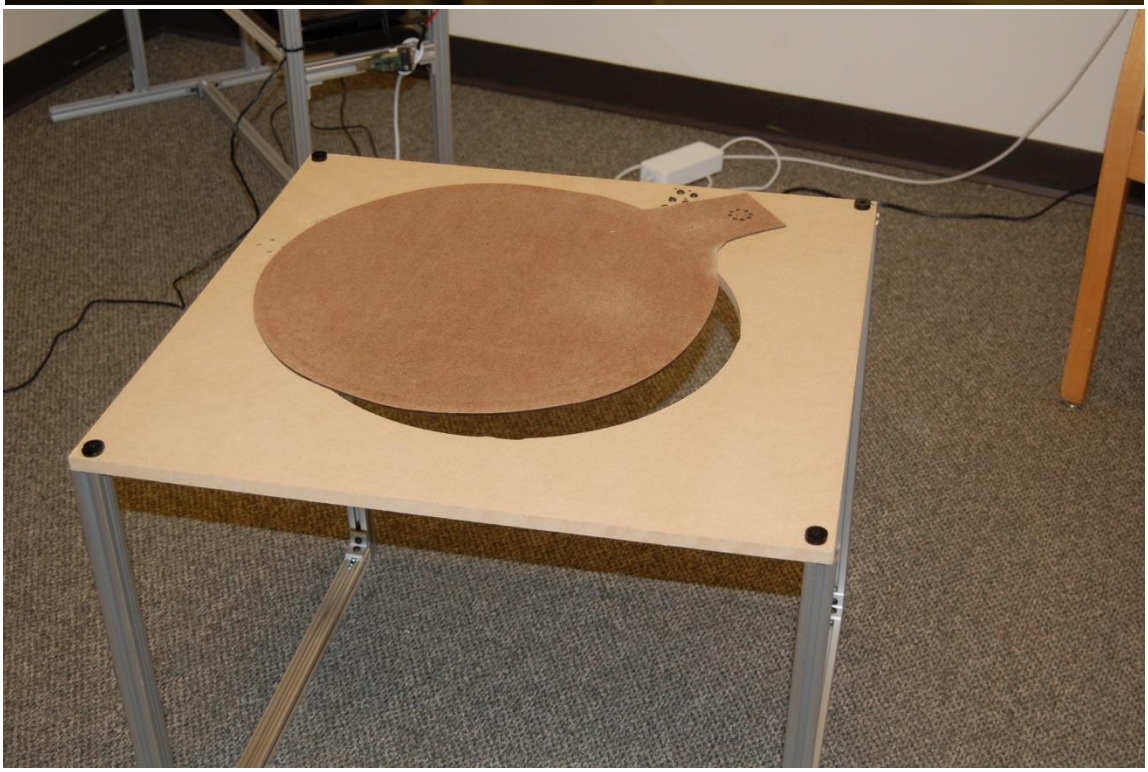


11. Take RX-64 servo subassembly from step 9 and mount to bottom wood piece by screwing the servo bracket to the drilled holes in the bottom wood piece with M5X18 screws. Make sure servo horn is centered in drilled hole of bottom wood piece.

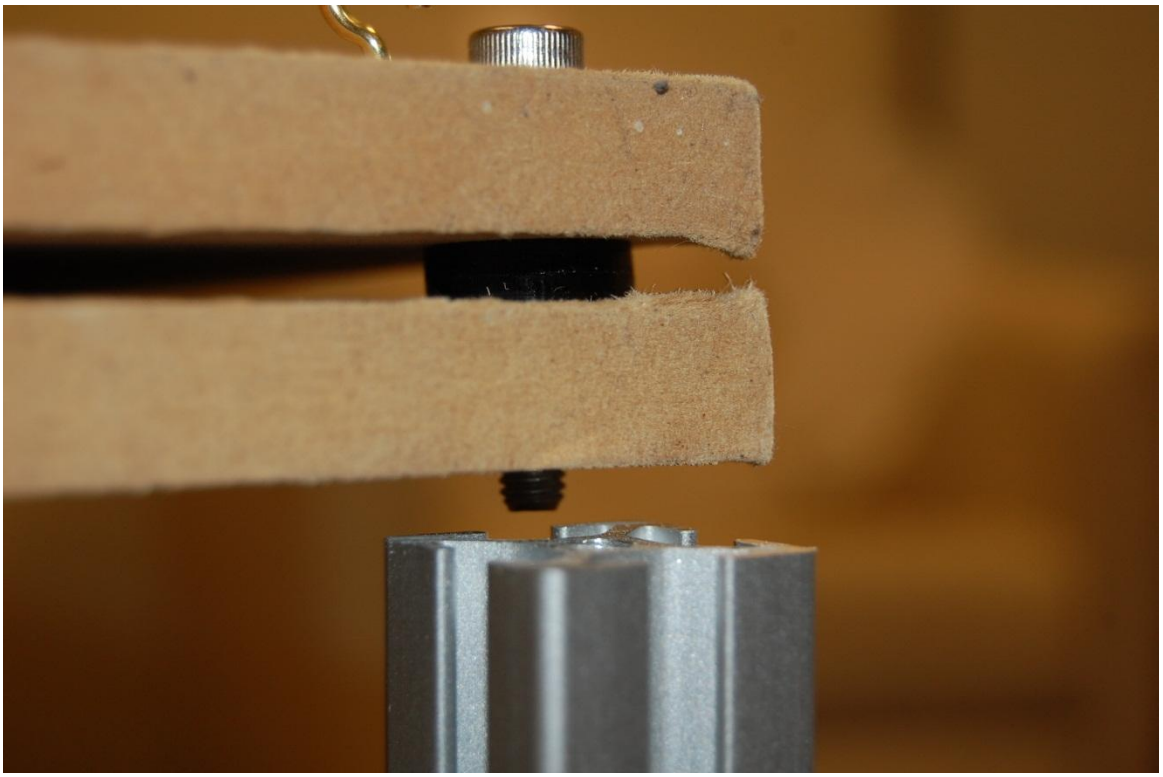




12. Take MDF hole cover and servo spacer and place on top side of bottom wooden piece. Line up MDF board screws to servo horn and tighten. Before attaching servo, be sure to check the range of motion and home position for encoder values to make sure it can open the playpen fully.
13. 3D print 4 plastic spacers or machine them. Dimensions included in wood_spacer.sldprt
14. Place bottom wood piece subassembly on top of 80/20 base structure. Then place wood spacers on each of the .24” diameter holes of bottom wood piece as shown below.

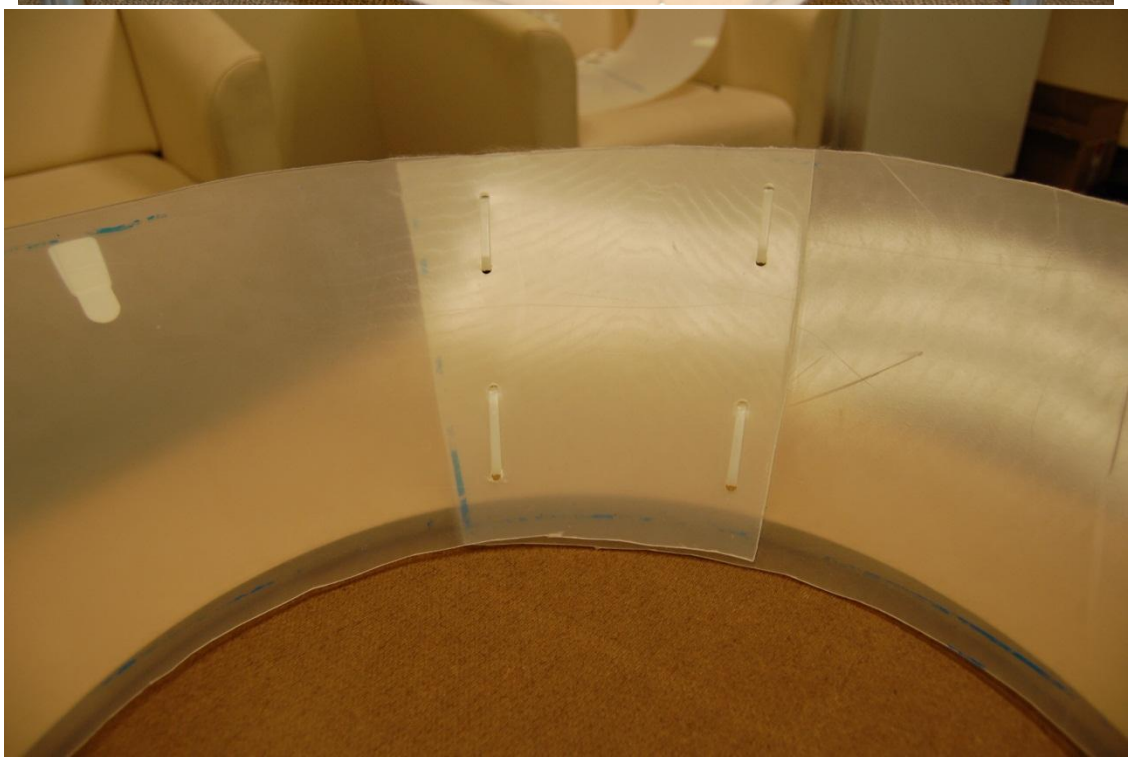


15. Take top wood piece and mount on top with M6X35 screws. Make sure all four holes are aligned when screwing wood top into 80/20 base.



16. Take Polypropylene Sheet, 1/16" Thick, 48" X 48", Translucent White and cut out cone shape. Reference cone.sldprt and cone_flat.sldprt for dimensions. Cutting two concentric 3/4 circles according to dimensions in cone_flat.sldprt is the recommended procedure for simplicity.

17. To join the cone together, clamp an overlap in the middle such that ¼ inch hangs over the edge of the top board. Make sure cone does not come into contact with MDF hole cover. After clamping, mark 8 holes to be drilled as seen in picture. Drill holes and join together with zip ties.



18. Attach hooks to top wood piece, preferably near .24" diameter holes. Also attach 3M Command Utensil Hook - 0.5 lb Capacity hooks to the cone. Then connect both hooks with rubber bands to constrain plastic cone to base.