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ISR - Sheet Metal Design & Fab

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My goal for this project was to improve my sheet metal design, CAD, and manufacturing skills. Sheet metal is great for both prototyping and production-line manufacturing, so it seemed like a medium I should get more comfortable with. The project I chose to realize in sheet metal was a mechanical air raid siren.

During the design stage, I consciously decided to try to use the best CAD practices I could. I improved my skills in parametric CAD a lot, so that only minimal changes were necessary to modify design from 10-hole side to 12-hole side. I also spent a lot of time thinking about manufacturability and how to design parts that would be physically foldable with the tools we have in the shop here at Olin. Finally, I got better at using the SolidWorks sheet metal tools simply by spending hours working with them.

Once design was finished, I got to implement my design in the shop. I got trained on the plasma cutter and learned what a valuable tool it can be for fast prototyping with sheet metal, but also what its shortcomings are. I had to have the shop staff cut some parts on the waterjet because the plasma cutter was not precise enough. I also learned how to set up and use jigs on the bending brake, and how valuable they are for making repeatable parts. After cutting and bending all the parts, I got to do some mechanical debugging to figure out how to work around the imprecision of the cheap bench grinder I bought to eliminate interferences.