

FINAL PRODUCT BREAKDOWN

FROM: 19F18 Northrop Grumman Standoff Team

**TEAM: Tyler Hans
Dakota Saska
Brandon Bass
Sage Lawrence
Elaine Reyes**

Due Date:
Friday, May 1, 2020 at 11:59pm

Provide several pics of the completed system here:

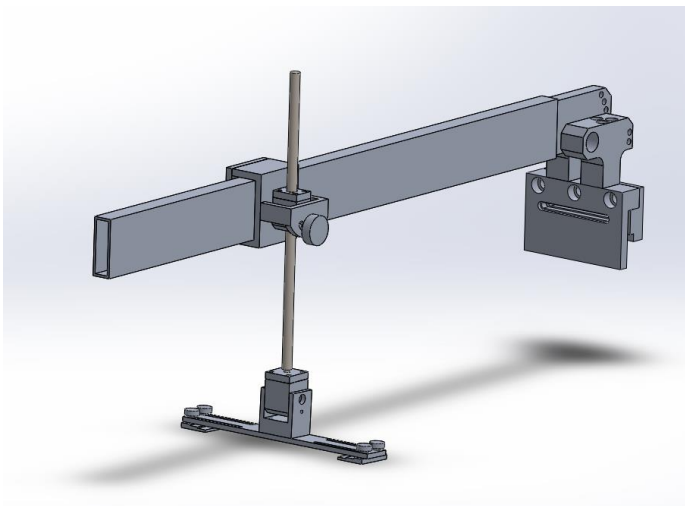


Figure 1. Final CAD Model



Figure 2. Final Product



Figure 3. Motor Ring Clamp



Figure 4. Angling Mechanism

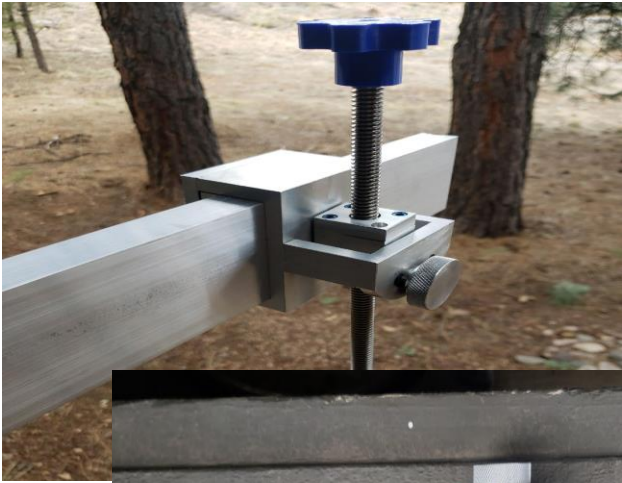


Figure 4. Rail System

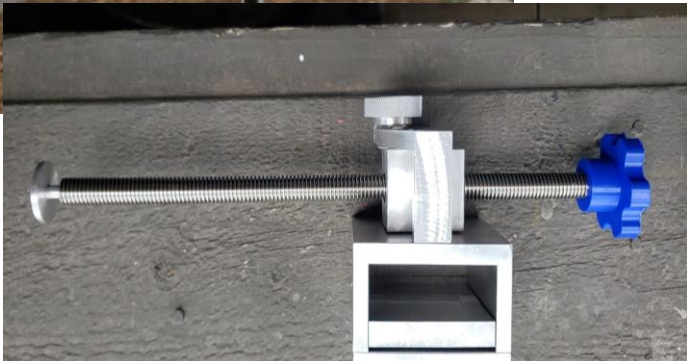


Figure 5. Rail Cart



Figure 6. Test Ring



Figure 7: Bracket Clamp Parts and Mock Ring Drill Template

The following are the Action Items each person completed between Hardware Review 2 and the completion of the final product:

Team Member: Brandon Bass

Action Item	Date Completed	Result/Proof of Completion
Website Check 2	03/25/20	Updated the teams website by adding in documents and meeting minutes. Did minor formatting of the website to make it easier to navigate.
Implementation Memo II	04/03/20	Worked on the standards and codes portion of the implementation memo as well as doing some editing and formatting.
Poster	04/18/20	Helped with formatting and editing of the poster along with other teammates.
Final Presentation	04/21/20	Added in manufacturing descriptions and did slide formatting and editing along with recording audio.
Final Report	05/01/20	Wrote the testing section and did formatting and editing.
Website Check Final	05/04/20	Added in final documents and re-uploaded video presentation.

Team Member: Tyler Hans

Action Item	Date Completed	Result/Proof of Completion
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Manufacturing: Lead Screw Cap, Outer Clamp, and Test Ring	03/13/20	Machined the Lead Screw Cap to size, Manufactured the Outer clamp after the curvature was completed on the CNC, and assisted in clamping and drilling the test ring with Sage Lawrence. These parts can be seen in Figures 3, 6, and 7.
Implementation Memo II: Section 1 - Implementation (Manufacturing and Design Changes)	04/03/20	Wrote the implementation section of the Implementation Memo II. Scored a 60/50 on the report.
Poster	04/18/20	Formatted, took pictures, and wrote the capstone poster along with other team members
Final Presentation: Testing, Schedule, and Budget	04/23/20	Formatted and presented the testing, schedule, and budget sections of the final presentation.
Final Report	05/01/20	Edited the document, wrote the future work section, reworked the tables, figures, and appendices, and talked about the impacts of COVID-19 throughout the report
Operations/Assembly Manual	05/01/20	Created the bill of materials for each subassembly, the overall bill of materials, assembly instructions for the angling mechanism, rail cart, and bracket clamp, and made the operations section.

Team Member: Sage Lawrence

Action Item	Date Completed	Result/Proof of Completion
Implementation Memo II: Risk Mitigation/Proofreading	April 3, 2020	Wrote the sections regarding risk mitigation and updated the document for fluidity/grammar purposes.
CAD updates	April 15, 2020	Made updates to the CAD model to more accurately represent the final model that was manufactured.
Final Presentation	April 23, 2020	Completed slides in the presentation covering the analysis of the ring and some of the component changes that have occurred recently.

Operations Manual	April 30, 2020	Created Exploded view for the CAD models to improve visualization in the manual.
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Team Member: Elaine Reyes

Action Item	Date Completed	Result/Proof of Completion
Individual Analysis: Pin Shear Analysis	March 12, 2020	Performed an analysis on the pin component that goes through the clamp angling mechanism. The assignment was submitted on March 12, 2020.
Website Check 2	March 24, 2020	Updated the gallery portion of the website
Implementation Memo II: Risk Analysis and Mitigation Section	April 3, 2020	Took information from the fall semester's risk analysis and mitigation and updated any outdated information.
Final Presentation	April 23, 2020	Set-up the powerpoint, recorded my slides, edited the final presentation, exported the presentation to an mp4 file, and uploaded the presentation to the team's website

Team Member: Dakota Saska

Action Item	Date Completed	Result/Proof of Completion
Manufactured Angling Bracket	March 13, 2020	Seen in figure 7, the small C shaped channel was faced to size. I learned how to program the Tormach CNC and run it to cut the C shape.
Implementation Memo II	April 3, 2020	Did the final edit/revision and submitted the teams Implementation II.
Final Presentation	April 23, 2020	Had 6 slides on the final presentation talking about the manufactured subassemblies.

Final Report	May 5, 2020	Wrote executive summary and edited/revised several sections. Updated figure numbers and proofread grammar and content.
Operations Manual	May 5, 2020	Helped Sage create the exploded sub assembly views for the operations manual. Wrote the maintenance and troubleshooting sections.