

Mallory Sico – JSC Pathways Intern



Contact Information

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Overview

- About me
- Previous Tours
- CC-3 Projects
- Pathways Involvement
- Lessons Learned
- Future Plans
- Acknowledgments
- Questions

About Me



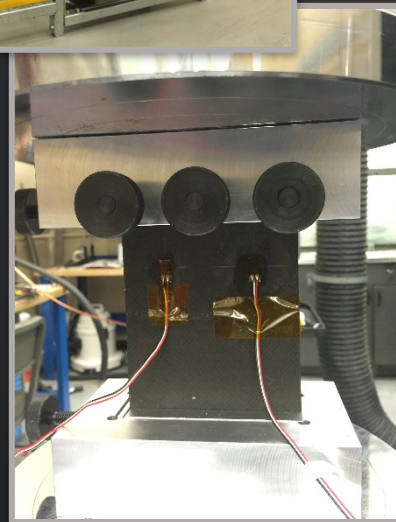
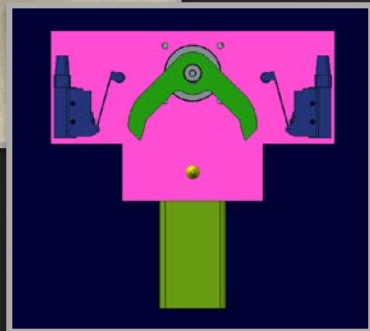
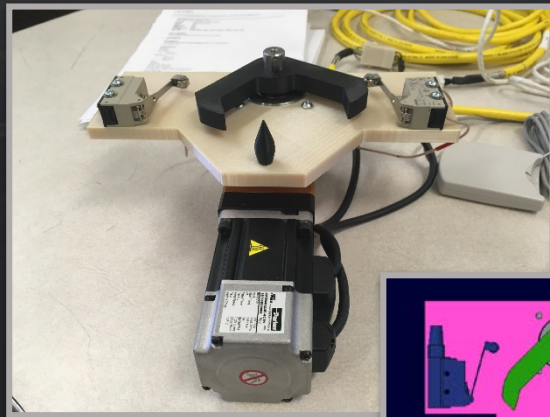
Background

- Hometown: Corpus Christi, TX
- University of Texas at Austin
 - Senior
 - Mechanical Engineering
 - Graduation: August 2018

Hobbies

- STEM Outreach
- Rock Climbing
- Travel
- Live music
- Football/Basketball Games

Previous Tour – ES4 Materials and Processes



- Acrylic Creep Test Stands
 - Designed, Procured, Assembled
 - Machine Shop Certified
- UT Torch
 - Designed and 3D printed parts in Creo
 - Created and modified homing set up program using ACR View
- Composite Compression After Impact Testing
 - Prepared samples for testing
 - Compression tested samples in load frame

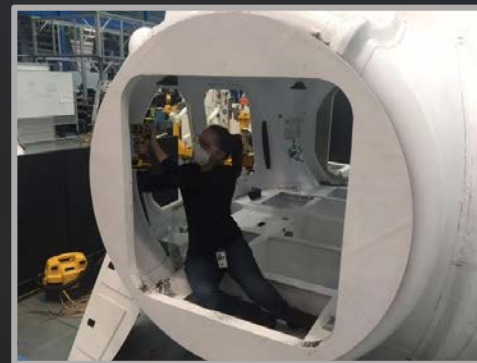
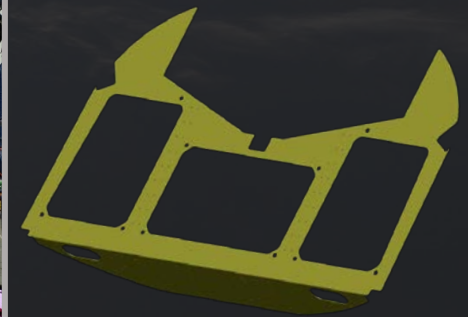
Previous Tour – CO5 ISO



- Created Visiting Vehicle databooks on ISO Wiki
 - Easier to update
 - Easier to access
 - Collaboration effort with ISO team leads
- Updated co-op and new hire processes
- OJT with ISO, PLUTO MPSR, and ISE
- Crew for SpaceX 9 Cargo Ops Sim

Previous Tour – ER5 Dynamic Test Systems

- Habitable Air-Lock (HAL)
 - Nose Drawings and assembly
 - Orion Docking Hatch 3D Print
 - Nose Floor Modification
 - Mock-Up Assembly
- ARGOS Test Subject



CC-3 Project Overview

- Static Simulator Instrument Panel
- Boat Tail Corrosion Repair
- Pitot-Static Probe Go / No-Go Gauges
 - Tip Gauge
 - Bend Gauge
- Pitch and Roll Actuator Exploded View
- DC-8 Documentation

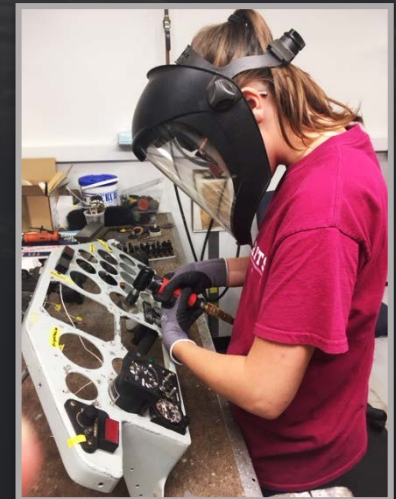
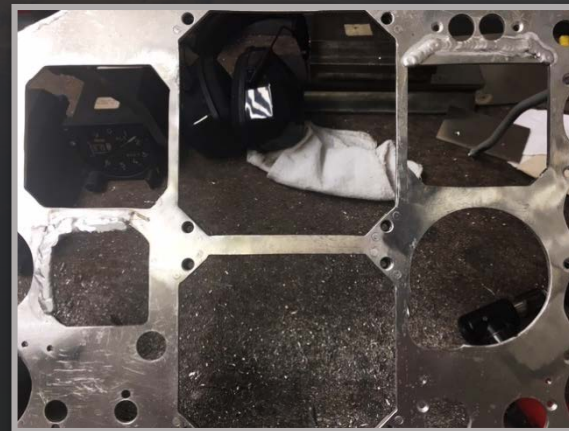
Instrument Panel Overview

- Purpose:
 - Improve Static Simulator by adding real instruments to panel
- Assignment:
 - Replace placards from T-38 Static Simulator with real A-Model Instruments



Instrument Panel Fabrication

- **Tasks Completed:**
 - Removed placards and instrument panel from simulator
 - Modified panel holes in sheet metal shop to match all instruments



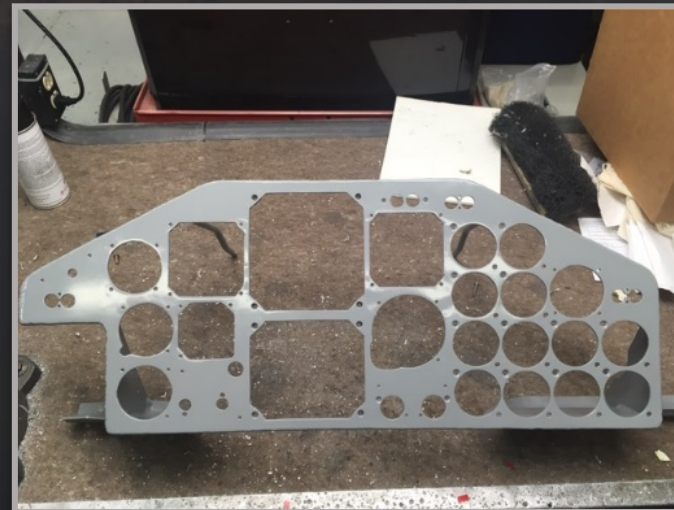
Instrument Panel Summary

- **Tasks Completed:**
 - Painted instruments and screws
 - Removed paint from panel using media blaster
 - Reinstalled panel into simulator



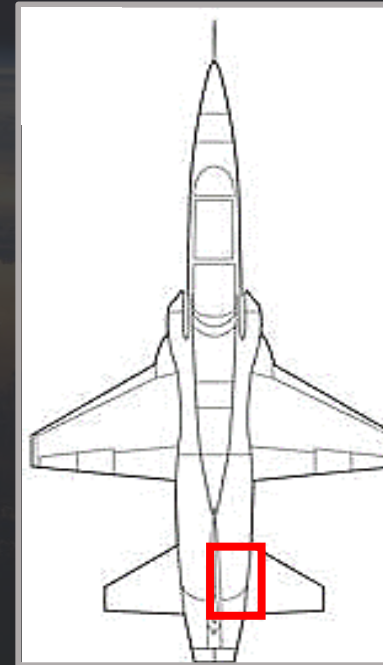
Instrument Panel Summary

- Tools Used:
 - Rotary file
 - Disc sander
 - Belt sander
 - Air drill
 - Tap
 - Band saw
 - Rivet shaver
 - Table saw



Boat Tail Corrosion Repair

- **Purpose:**
 - Corrosion found on boat tail of 917
- **Assignment:**
 - Assist in boat tail corrosion repair on T-38



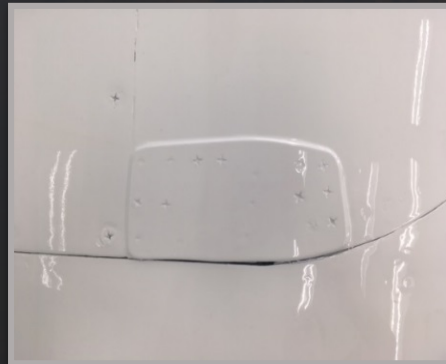
Boat Tail Corrosion Repair

- **Tasks Completed:**
 - Created filler and doubler
 - Attached to aircraft with various fasteners
 - Solid rivets
 - Blind rivets
 - Jo bolts



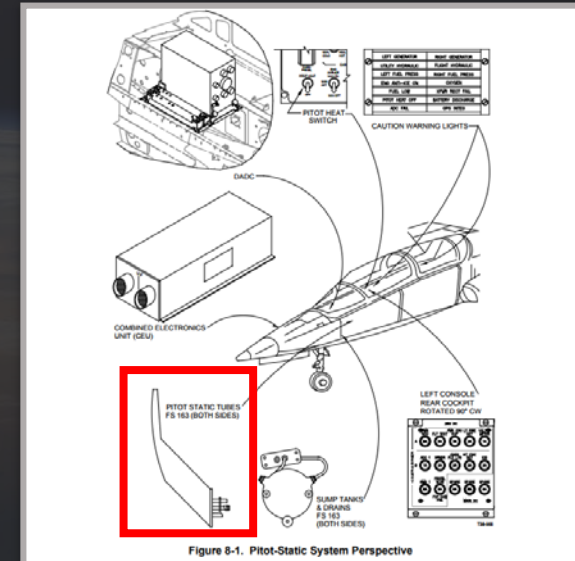
Boat Tail Corrosion Repair

- **Tasks Completed:**
 - Placed sealant around doubler edges
 - Learned about EWOs and aircraft structure repairs



Pitot-Static Probe Go/No-go Gauge

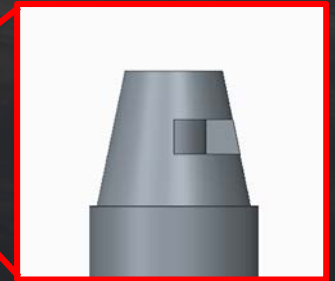
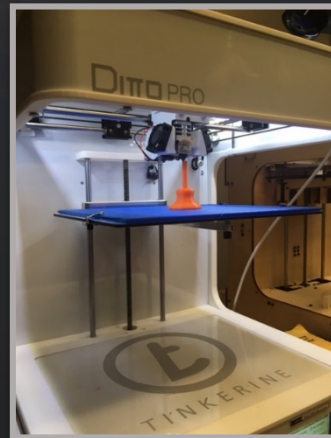
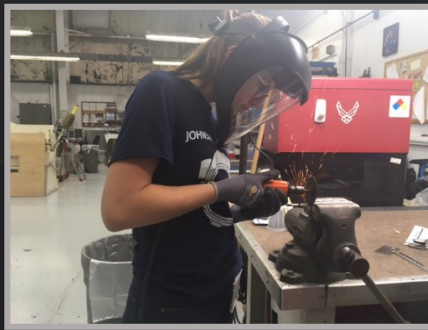
- Purpose:
 - Pitot-static probes are used on aircraft to provide altitude and air speed
- Assignment:
 - Model pitot-static probe in Creo 2
 - Unable to get vendor drawing
 - Measured new probe to get dimensions
 - Design and manufacture two gauges for pre-flight checks
 - Go/no-go gauge for front opening
 - Bend gauge for body of probe



Pitot-Static Probe Go/No-go Gauge

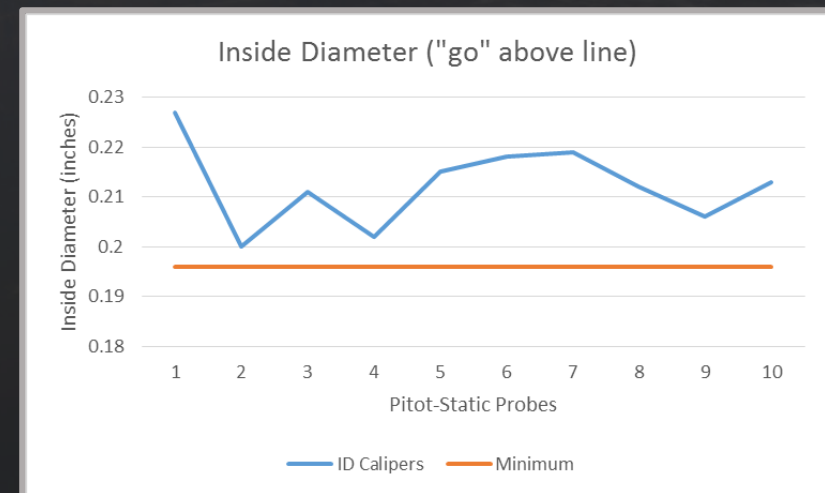
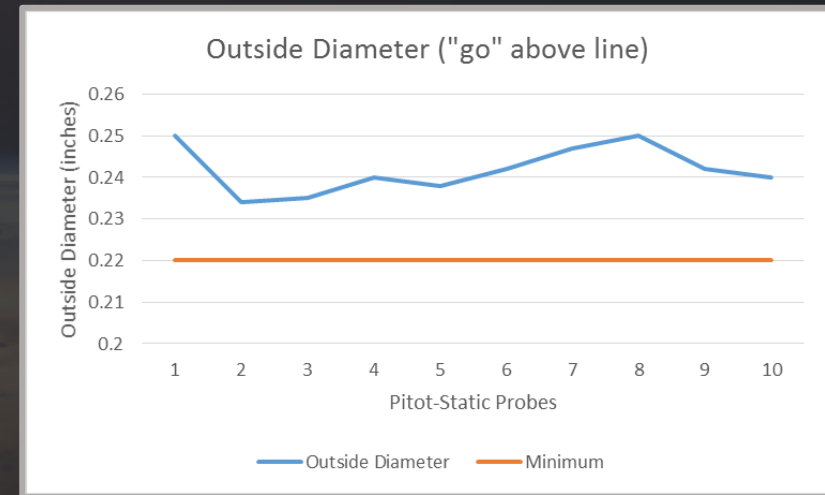
- **Tasks Completed:**

- Measured and modeled the pitot-static probe using Creo 2
- Created prototype tools using size #2 drill bit and handle
- Modeled prototype gauge with measurement indentation
- 3D printed using B9 and collaboration space printer



Pitot-Static Probe Go/No-go Gauge

- Inspection criteria minimum currently gives “go” for bad probes
 - Inspection criteria minimum shown in orange
 - Measurements of unserviceable probes shown in blue
 - Unserviceable probes sit above the minimum
- Future Work
 - Update tool dimensions and 3D print
 - Form 21 for T-38 inspection criteria documentation



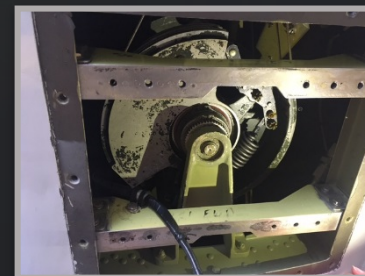
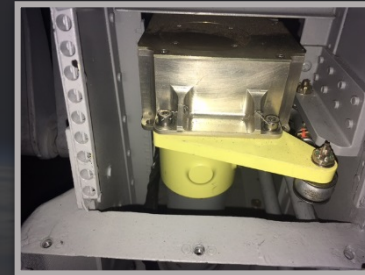
Pitot-Static Probe Go/No-go Gauge

- Tasks Completed:
 - Created prototype using inclinometer, cardboard, and plastic clamps
 - Redesigned gauge for simpler tool method
 - Modeled contour mold for bend gauge
 - Modeled prototype from pitot mold
 - 3D printed using collaboration space printer



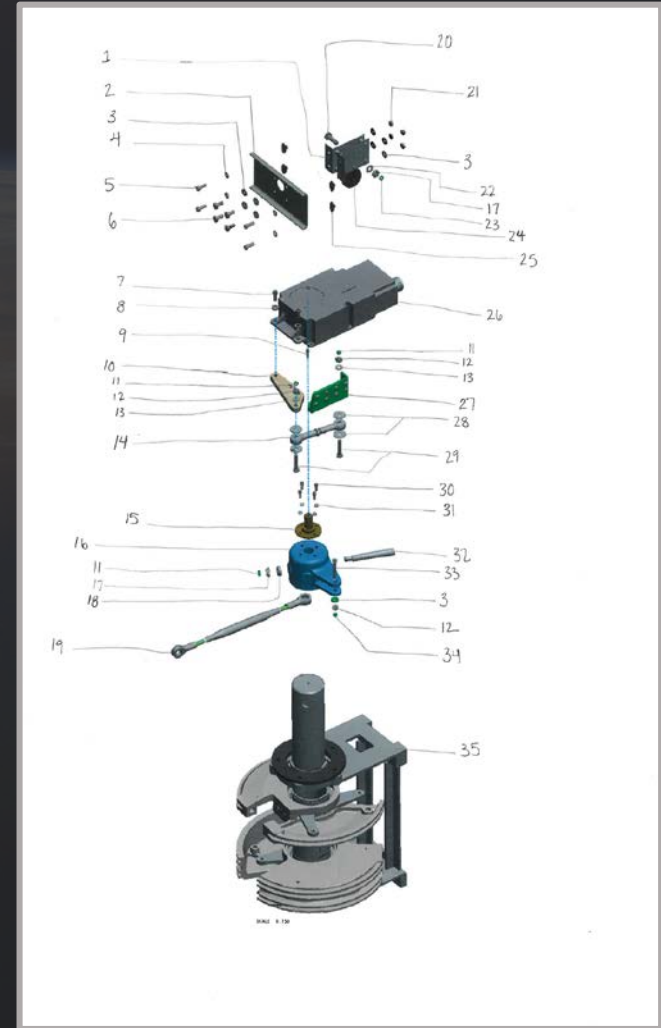
Pitch Actuator Stack Up

- Purpose:
 - Updating tech data for autopilot modifications to aircraft
- Assignment:
 - Create exploded view with part tables for pitch and actuator stack-up



Pitch Actuator Stack Up

- **Tasks Completed:**
 - Exploded model in Creo 2
 - Worked with Documentation to get correct views
 - Worked with Supply to find all part numbers for table
 - Assembled all drawings and tables for documentation for pitch
 - Completed Form 21 for pitch actuator updates

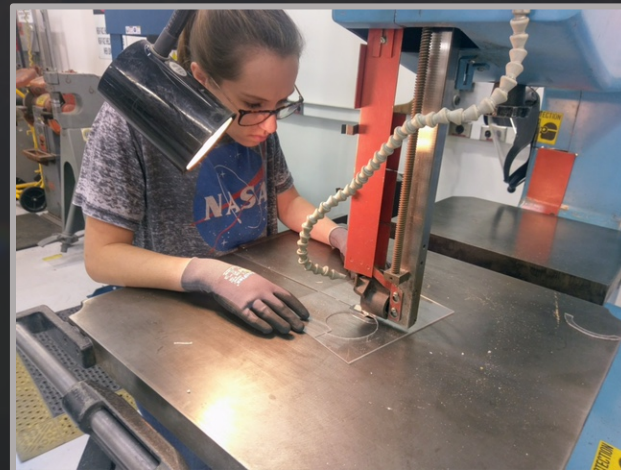


Roll Actuator Stack Up

- **Tasks Completed:**
 - Found all part numbers and cage codes for roll actuator exploded view
 - Red lined original actuator drawings
 - Found error in Airforce documentation
 - Compared NASA and Airforce documents with aircraft number of bolts
 - Assembled all drawings and tables for documentation for roll
 - Completed Form 21 for roll actuator updates

CC Activities

- WB-57 suit up
- T-38 Simulator flight
- Sheet metal tool training
 - Honeycomb repair
- T-38 show-and-tells



Co-op Program Involvement

- Co-op Anniversary Chair
- Kickball Team
- AOD Co-op Challenge



Lessons Learned

- Tools and processes used in Sheet Metal Shop
- Implementation of EWO's on aircraft repairs
- Advantages and disadvantages of manufacturing techniques
- Creating models, drawings and exploded views in Creo
- Importance of designing for fabrication and function
- Maintenance, Supply and Documentation procedures

Future Plans



Fall 2017, Spring and Summer 2018
Last year of school



After graduation
Full-time job at NASA?

Acknowledgements

- Jack Woods
- Angela Bauer
- Aldora Louw
- Cary Klemm
- Neal Hunt
- Christy Darcie
- Ernie Prado
- Derek Rutovic
- AOD Engineering Branch
- Aircraft maintenance
- Sheet Metal Shop

Questions?

Bonus Pictures

