

*Team 6 - Progress Report*  
Panel Interlocking Mechanism for  
Solid Reflector



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# Overview

- Project Scope
- Planning
- Approach
- Status
- Materials List
- Summary
- Questions

# Project Scope 1 of 2

- “...create a **working prototype** of interlocking panels to demonstrate its functionality.”
- “...both teams must **work together** to define interfaces and ensure final prototype performs as expected.”



Over 4,000 m<sup>2</sup> (42,000 ft<sup>2</sup>) of production floor space is dedicated to deployable antennas.

Statement of Work under the

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HARRIS-FLORIDA STATE UNIVERSITY MASTER  
RESEARCH AND DEVELOPMENT AGREEMENT

I. PROJECT NAME:

- A. TWO STEP HUB MECHANISM FOR SOLID REFLECTOR DEPLOYMENT
- B. MAGNETIC PANEL INTERLOCKING MECHANISM FOR SOLID REFLECTOR

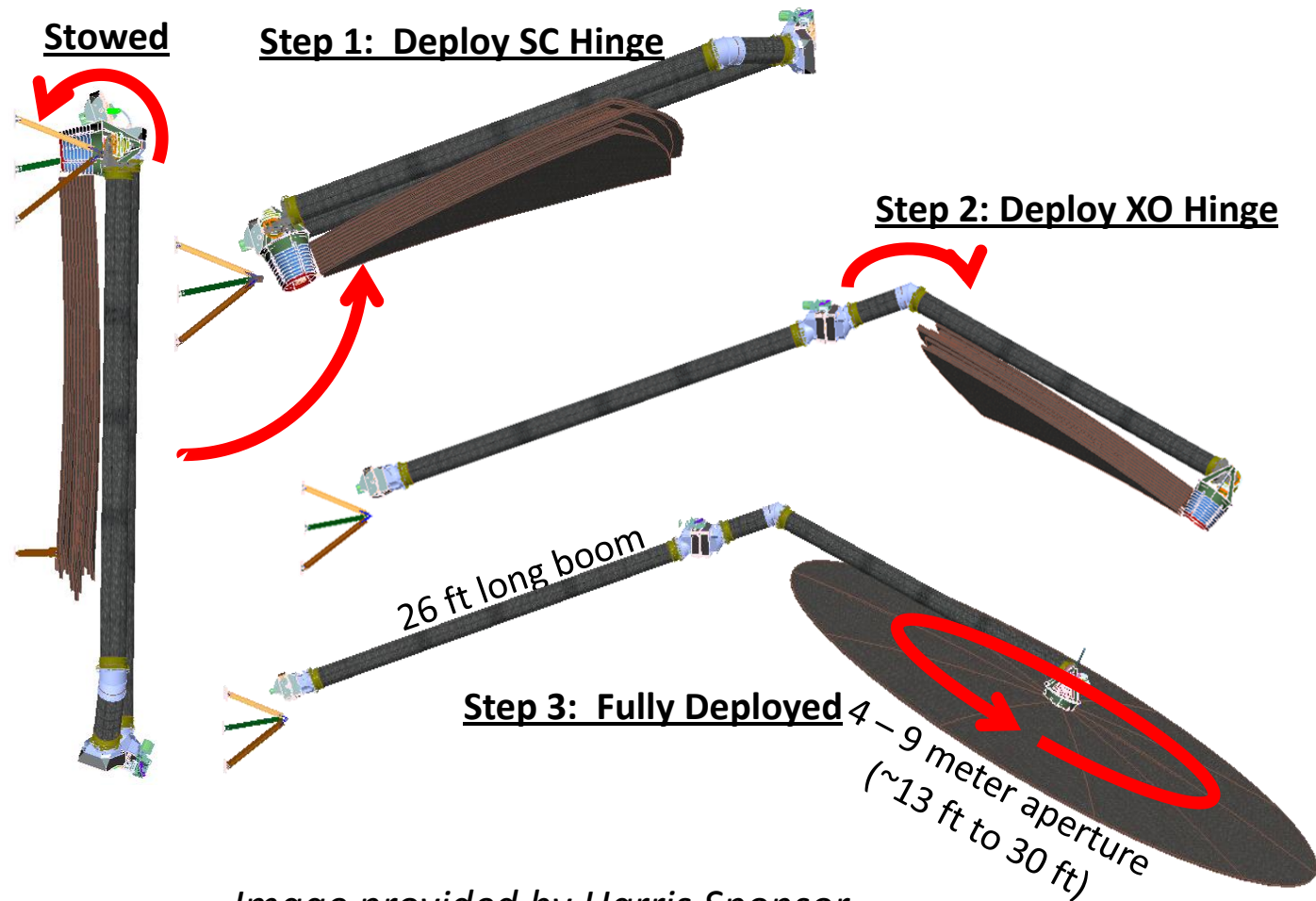
II. PROJECT PERIOD: SEPTEMBER 21<sup>TH</sup>, 2011 TO MAY 15<sup>TH</sup>, 2012

III. Parties:

FLORIDA STATE UNIVERSITY:  
Principal Investigator

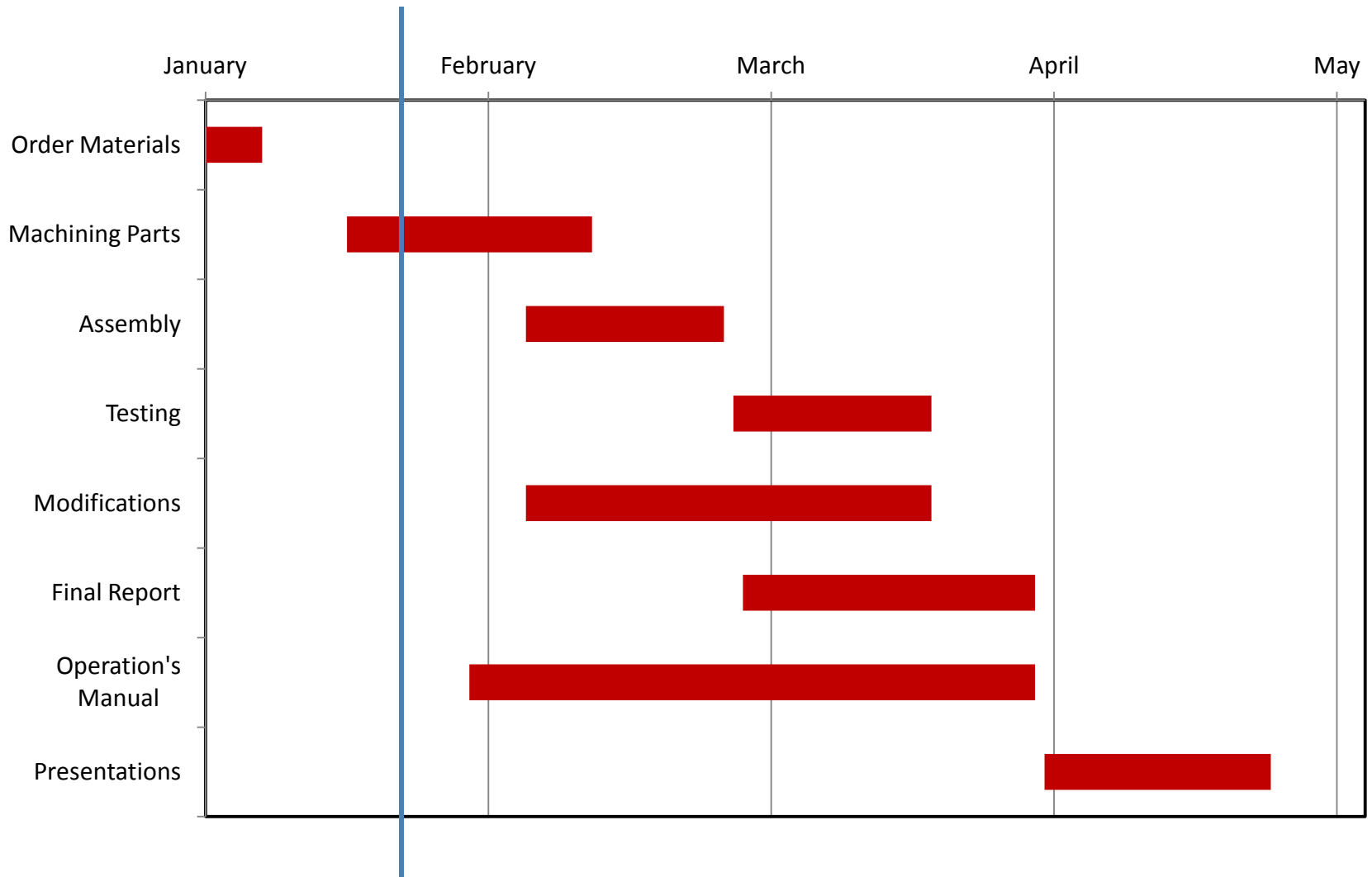
# Project Scope 2 of 2

- Tangentially Deployed  
Achieved by hub mechanism design
- High Surface Accuracy  
Achieved by rigid material
- Interlocking Panels  
Achieved by panel design



*Image provided by Harris Sponsor*

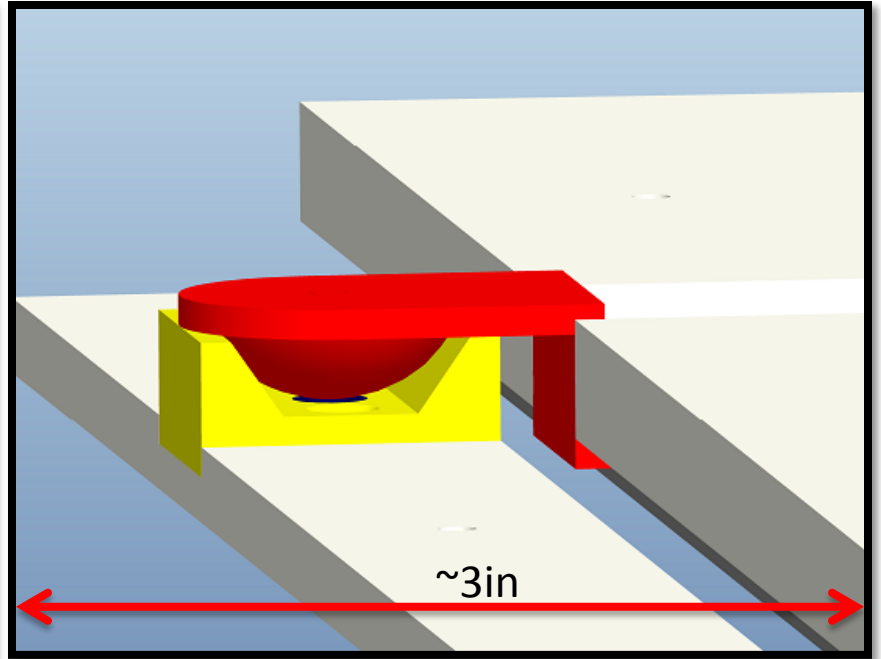
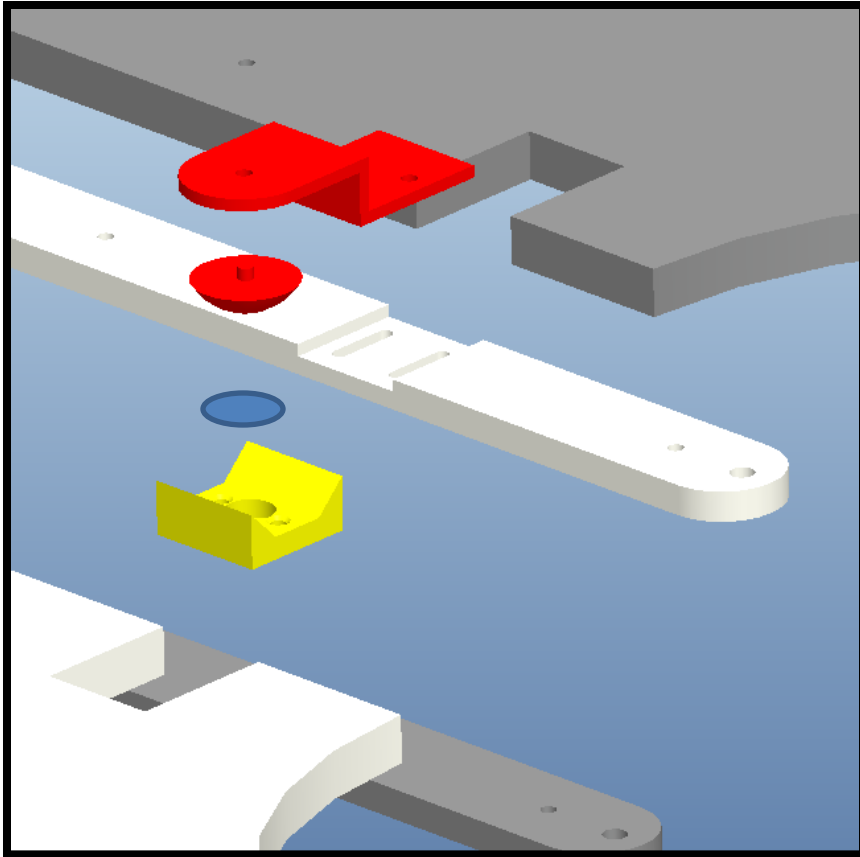
# Planning



# Approach

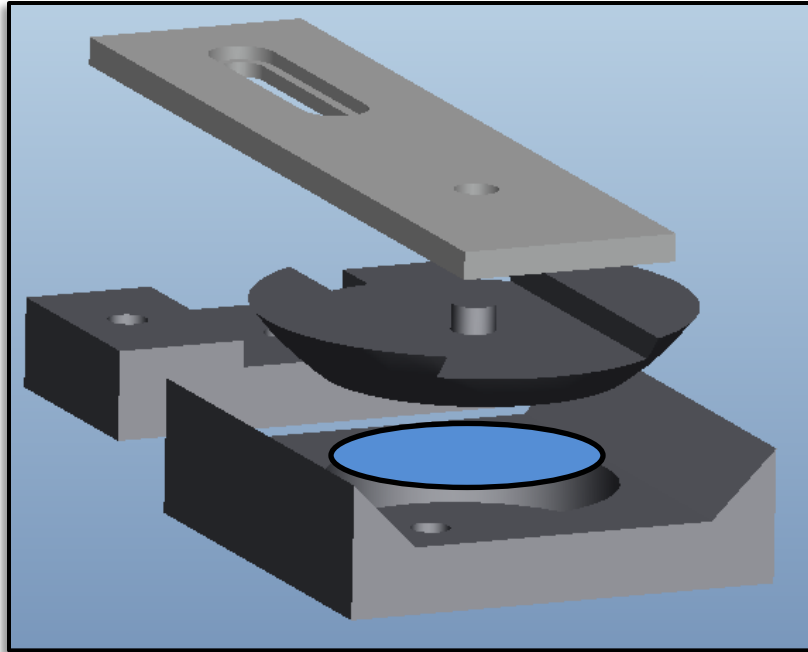
- ✓ Kickoff Meeting
- ✓ CAD Models of Concepts
- ✓ Select Best Concept using Trade Matrix
- ✓ Hardware/Materials list
- ✓ Order Materials
- Build Panel Prototype
- Integrate Panels to Hub Mechanism
- Complete Required Reports
- Work together with Harris Hub team

# Status – Fall Design

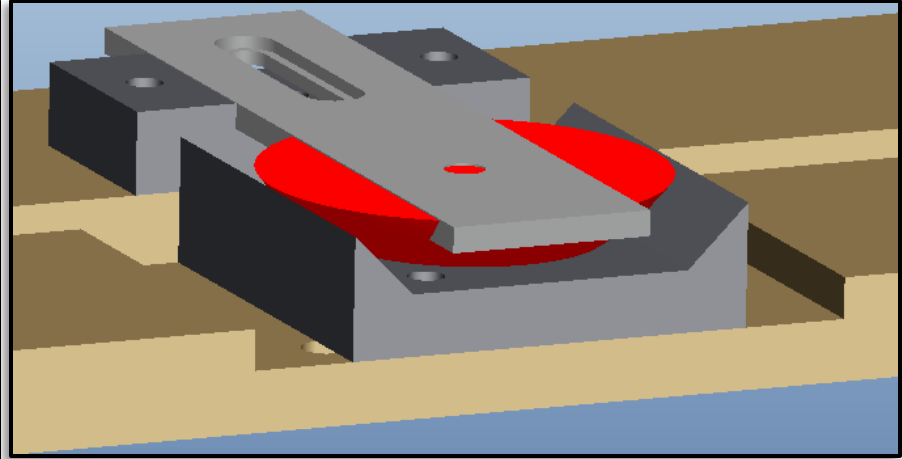


- Final Design from Fall

# Status – Current Design



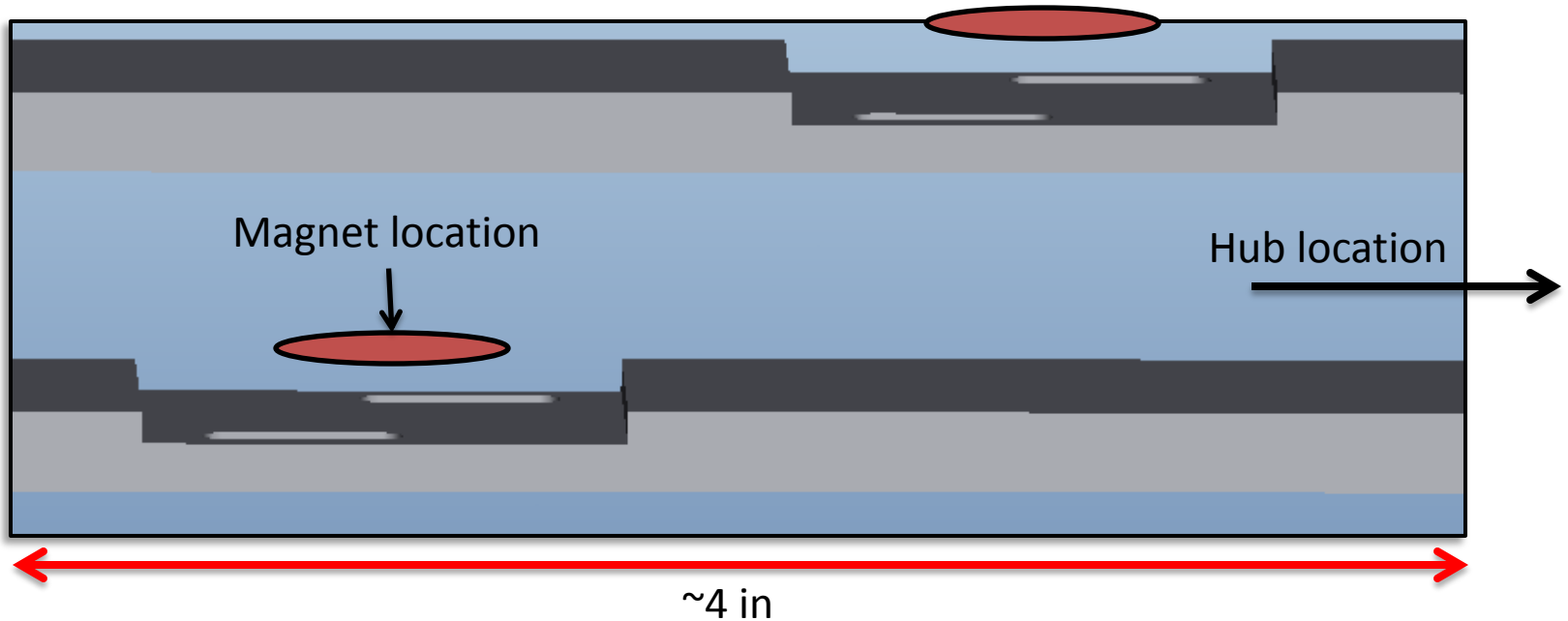
~2in



- Improved Optimization
  - Reduce size of components
  - Maximize magnet size (increased strength)
  - Ease of fabrication
  - Ease of assembly and modification



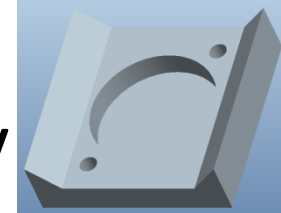
# Status – Current Design



- Brackets have staggered orientation so magnets do not interfere
- Allows optimal space without interference when in stacked position

# Status - Fabrication

- V-Block being machined currently
- Drawings for all parts being finalized



Part	Materials	Order Status
Cone	Steel Rod 1"x12"	In Stock
V-Block	Aluminum 6061 - 1"x0.5"x12"	In Stock
Bracket	Aluminum 6061 - 1"x0.25"x12"	In Stock
Armature	Aluminum 6061 - 1"x0.2"x12"	In Stock
Magnets	Neodymium 0.65"x0.125"	Processing
Hardware	[Steel] Bolts/Nuts/Washers	Processing

# Summary

- Parts are currently being machined
- Prototype fabrication and assembly will be done before Spring Break



# Questions?