•Introduction
•Controls
•Metrology

Formation Flight Subsystem Plan

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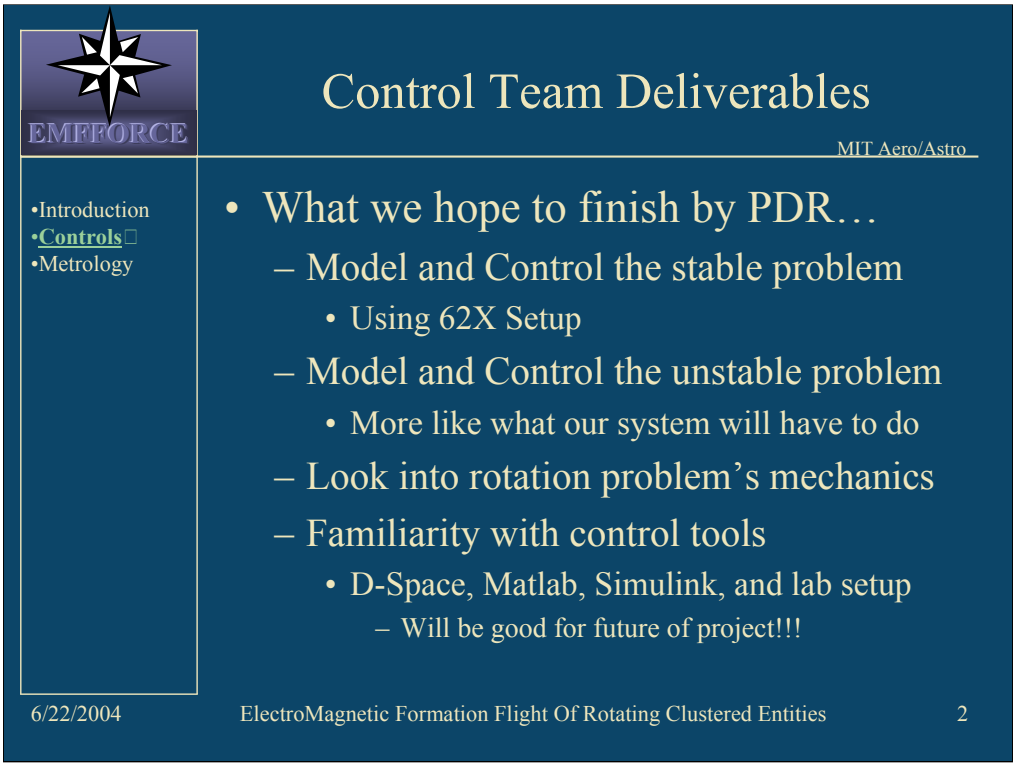


<BAB>

The purpose of the TARR is explicit in its name, Trade Analysis and Requirements Review. Specifically, the class hopes to review the requirements that have been levied and the trade analyses that have been conducted. The purpose of presenting this to an audience is twofold:

1. To require the class to polish their work by having to make it presentable to an outside audience.
2. To seek outside view of our work as it stands.

The class realizes that we do not have all the answers and hopes that through this exercise we will gain further understanding and new insight into the project.

Schedule

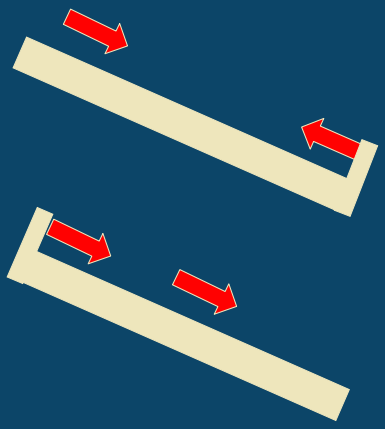
•Introduction
•**Controls**
•Metrology

- 4/11/02 -- Acquire knowledge of Control Theory and helpful Software
- 4/18/02 -- Model of experimental systems and possible control designs
- 4/25/02 -- Gain better understanding (model?) the spin-up/de-spin modes
- 5/2/02 – Demonstrate control of the stable system (at least) and complete preliminary PDR slides

Completed Tasks

•Introduction
•**Controls**
•Metrology

- Models of stable and unstable modes



Stable Mode poles:

$$\pm\sqrt{\frac{4c_0\mu_{AVE}^2}{x_0 m}}i$$

Unstable Mode poles:

$$\pm\sqrt{\frac{4c_0\mu_{AVE}^2}{x_0 m}}$$

Completed Tasks …

•Introduction
•**Controls**
•Metrology

- Possible controllers for stable plant have been developed using Matlab's sisotool
  - Cannot be implemented until we are allowed to use 62X's lab setup the 23rd

Metrology Team Deliverables

•Introduction
•Controls
•Metrology

By PDR we hope to have…

- A final design for the metrology system including:
  - Number of each type of sensors
  - Estimated power requirements
  - Estimated processing requirements
- Algorithm to obtain distance and angle data from the sensor input

Schedule

•Introduction
•Controls
•Metrology

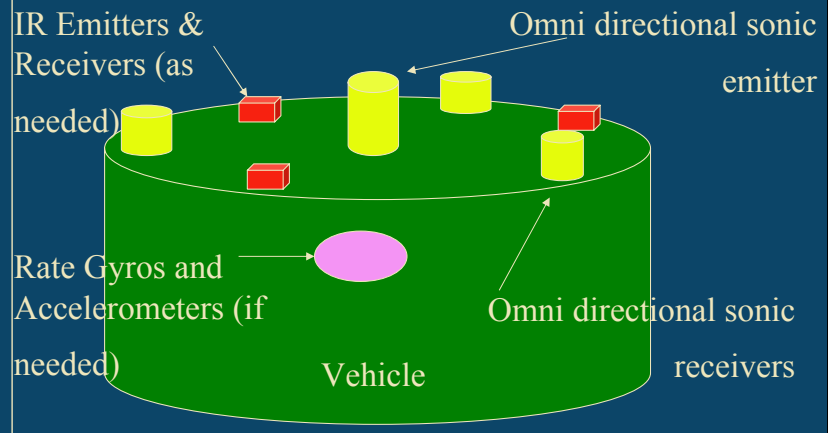
- 4/11/02 – Acquire knowledge of SPHERES metrology system
- 4/18/02 – Complete Preliminary design
- 4/25/02 – Create Algorithm for metrology system
- 5/2/02 – Complete PDR slides and testing for proof of concept (if possible)

Completed Tasks

•Introduction
•Controls
•Metrology

- Met with SPHERES team members
- Compared various concepts for metrology system
- Decided upon a design for the system

Completed Tasks

•Introduction
•Controls
• Metrology

- Preliminary Metrology system design