



Group Objective

- Identify high risk elements
- Explore and test potential design options
- Develop preliminary subsystem design

Task Breakdown

Structure & Power

Vehicle Casing

Magnetic Shielding

Air Bearing

Power

High Risk: Structure

- Air Bearing:
 - Vehicles must obey Flat-Floor rules of contact
 - Development and procurement time
- Magnetic Shielding:
 - Shield crucial electronic subsystems from electro-magnetic field
 - Must not interfere with controlling forces
- Vehicle Casing:
 - Strength in case of collision
 - Thermal considerations due to magnet heating
 - Total mass consideration

Action Items: Air Bearing

- Research
 - Flat Floor Facility contact rules
 - Tolerance on air cushion thickness
 - Profile of air cushion thickness with changing mass
 - Air bearing procurement time
 - Cost of bearing set-ups: manufactured and purchased

If we decide to fabricate these ourselves we will also have to have made cad drawings of our air bearings.

Action Items: Shielding/Casing

- Obtain information and/or sample materials from shielding vendors and conduct tests.
- Decide upon shielding material and vendor.
- Brainstorm subsystem interfacing configurations.
- Decide on material(s) for casing.

Magnetic shielding tests will be conducted by placing electronics next to electric fields and observing behavior when shielded and unshielded.

Configurations should include access panels.

High Risk: Power

- Finding batteries that will provide the necessary power.
- Providing between individual subsystem components (via voltage regulators).

Power for this system will be much more challenging than was for the previous project, SPHERES, because of the high power draw from the electro-magnets.

Action Items: Power

- Obtain power requirements and/or dependable estimates from each individual subsystems.
- Investigate battery types.
- Investigate interfacing methods.

Group Milestones

To date:

- Met with Paul Bauer re: air bearing set-up and tests.
- Contacted shielding and air bearing vendors.
- Contacted requirements team re: flat floor rules.
- Ruled out solar power as a possibility.

PDR:

- Baseline high level vehicle casing design (CAD drawings).
- Finalize vehicle mass.
- Place orders for experimental materials/components.
- Construct power model.