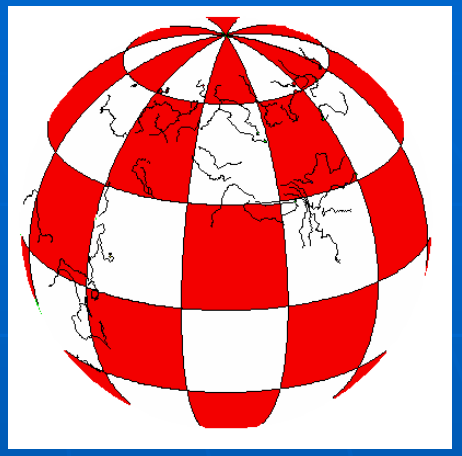

PRIDE

Photocell Radiometry and Iron Deposit Experimentation

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Problem Statement

What terrain types on Terrablair have viable iron ore deposits for use in Terrablair colonies?

Objectives

- To determine which locations on Terrablair contain iron ore deposits
- To determine the reflectance of Terrablair's surface and ground truth orbiter reflectance data
- To determine the type of terrain the iron will be found on

Questions

- How can magnetic fields be used to detect iron deposits?
- How accurate is the X-9000 radiometry data and how can it be ground truthed?
- What is considered a viable iron ore deposit?
- What types of values will be returned by the handyboard?
- How will the handyboard values be converted to CBL values?

Diagram of Rover

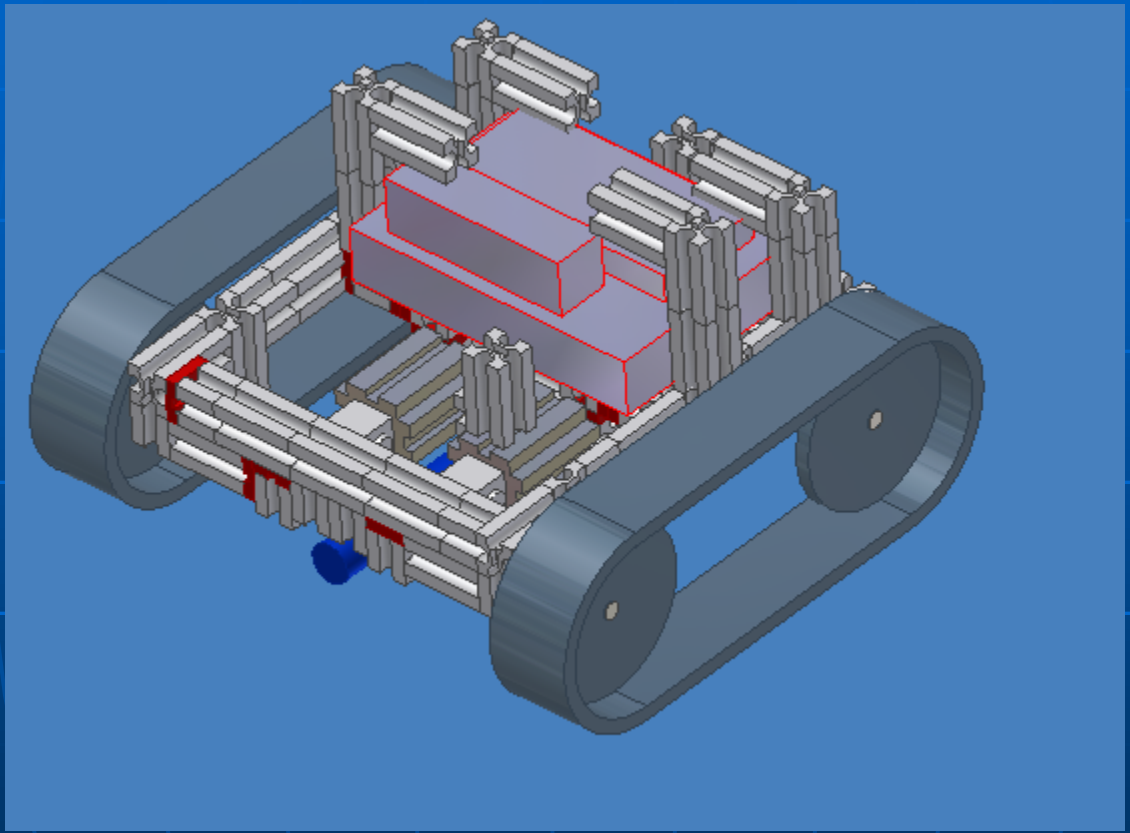


Diagram of Sensor Array

Needs to be in inventor →

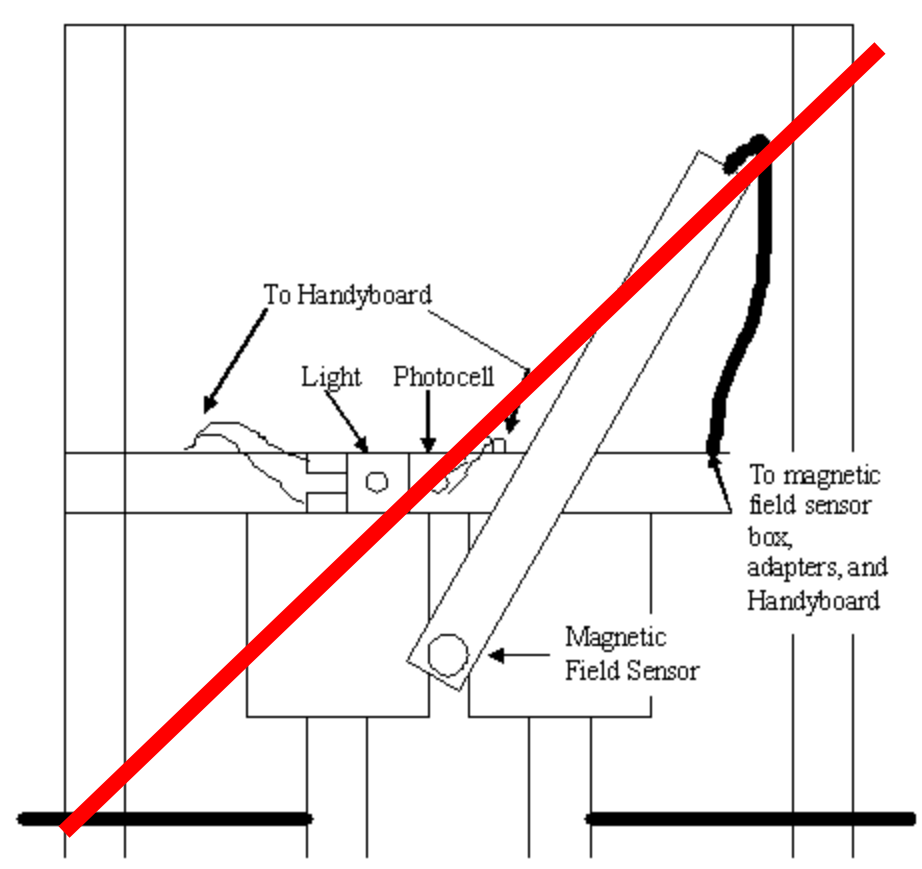
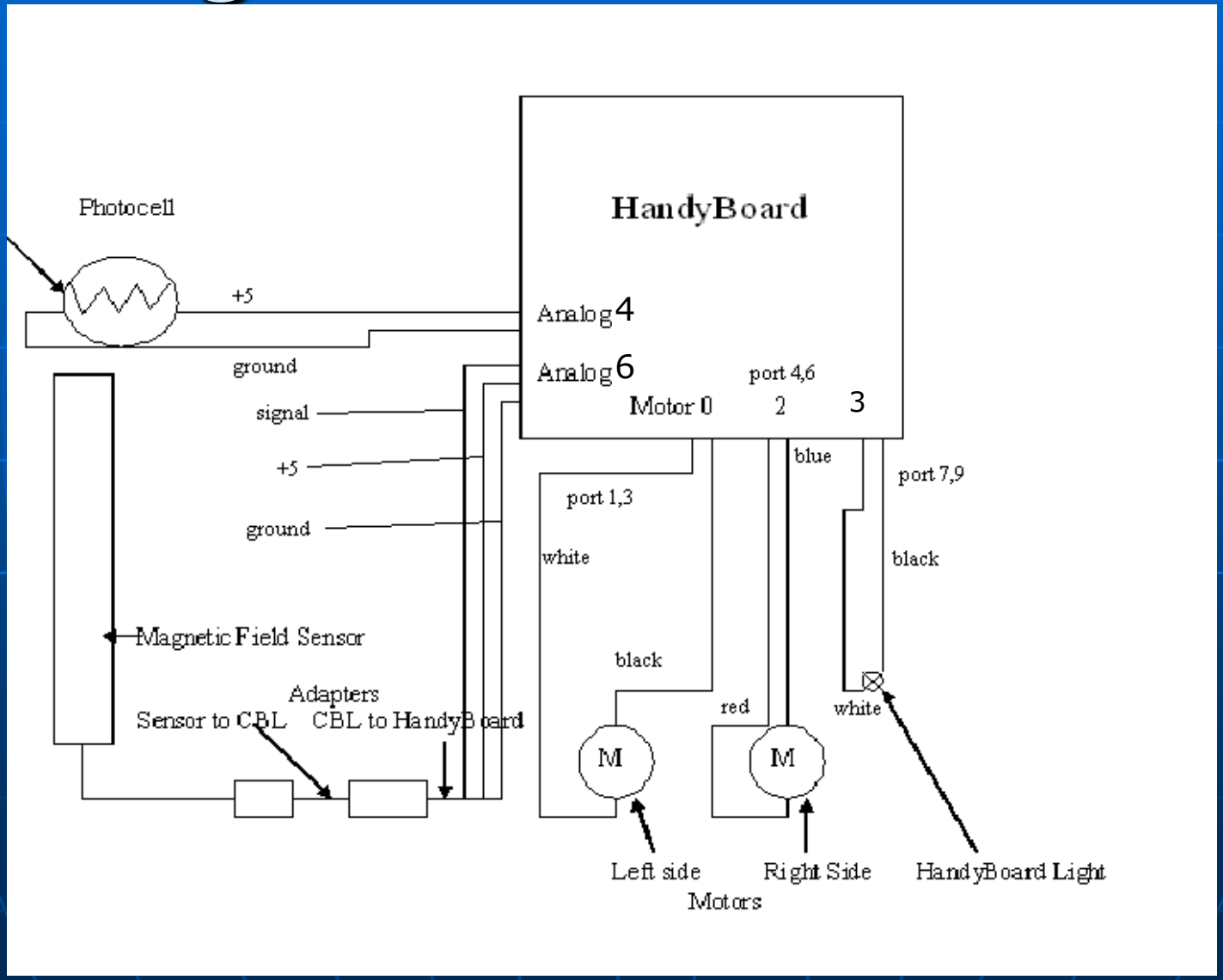


Diagram of Schematics



Sensor Capabilities

- Magnetic Field Sensor
  - Measures strength of magnetic fields
  - Accurate to one hundredth of a Tesla
- Photocell
  - Measures reflected light
  - Accurate to one hundredth w/cm^2

Data Analysis Techniques

- Find irregularities in magnetic field measurements to determine where iron is located
- Plot such areas on a map using image processing software
- Analyze radiometry
- Determine radiometry correlation to terrain

Experimental Control

- Bring experimental control to Terrablair
  - Iron
    - Actual value of magnetic field
    - Range to determine if iron exists
  - White paper
    - [this isn't in the program --Chris]Initial radiometry value
- Control discarded after initial measurements

Experimental Control

- Ground truthing
  - Iron
    - Initial range of viable magnetic field
  - Radiometry
    - Shades of gray
    - Isolated box
    - Controlled light

Expected Results

- Iron ore
  - Search for irregularities in measurements
    - Iron located where irregularities exist
  - [may want to change, does anybody have a better idea?--Chris] Iron will be found were it has been placed by Nature*
  - Qualitative statement as to viability of iron deposits

* a.k.a Clarels Coello

Expected Results

- Radiometry
  - Ground truthing data similar to orbiter data
    - Possible error - certain areas received more incidental light during orbiter data collection
  - More even distribution of light
  - More accurate radiometry values

Rover Path