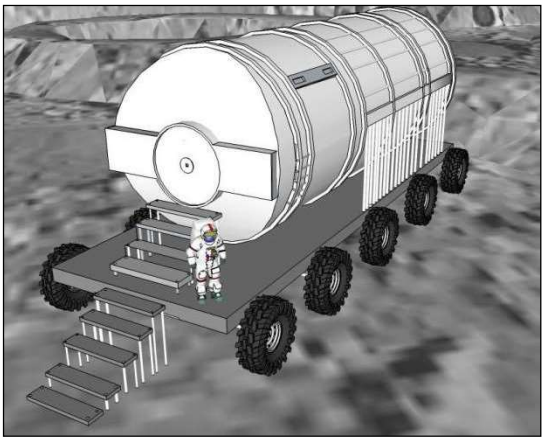
Mechanical/Aerospace Sustainability Project

Lunar Habitat

Mission Statement

To investigate life support and structural design issues for a long-term lunar habitat with an emphasis on power, weight, and volume requirements.



Synopsis

NASA's long-term goals include an eventual return to the lunar surface as part of the Constellation program. Lunar missions will be conducted in three phases. Phase two of this plan focuses on extended lunar surface stays of up to 180 days. Because of their relatively long duration and the difficulty of regular resupply, these missions will require a greater level of closure within the environmental control and life support system than previous spacecraft. Water and oxygen must be conserved and recycled and the systems used to regulate and sustain a livable environment must be as maintenance and consumable-free as possible.

This team focused on gathering as much data on life support requirements as possible, conducting initial trade studies on potential environmental control and life support technologies, and sizing the habitat module interior based on subsystem, storage, and crew space needs. The final report included 3D design models created in AutoCAD. The interior designs were created in SketchUp.

The work accomplished thus far serves as a baseline for future development. A continuation of this work is anticipated for the 2010-2011 academic year and will include thermal and material analysis to provide radiation shielding.

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