



SENIOR DESIGN ORGANIZATION PROJECT DESCRIPTIONS

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EVA CREW/SMALL CARGO LIFT FOR FUTURE NASA LUNAR LANDER

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In anticipation of man's return to the moon, the National Aeronautics and Space Administration has challenged university engineering seniors to design elements that may someday be incorporated in the chosen landing craft. The proposed *Rigel EVA Crew and Cargo Lifting System* is an integrated stair and elevation mechanism designed specifically for a future lunar landing module. This design will incorporate a staircase or ladder system and a lift platform to be operated by the EVA crew. Together the *Rigel EVA Crew and Cargo Lifting System* will move small cargo and crewmembers safely between the lunar surface and the airlock capsule of the lander.

The innovative design of the system will minimize the overall weight of the lander while providing a reliable means of deploying equipment and securing cargo and samples from the lunar surface. NASA has specified a height requirement of 6 meters from the top of the lander platform to the lunar surface. They have given a total system mass constraint of 115 kilograms to convey a crew and payload of 230 kilograms. The lift platform will be powered by electric motor. Among the options for the lifting mechanism; cables, gearless winding drums and worm gears are being considered. The design intent is to have a fixed means of manually moving between the surface and lander; i.e. the ladder system, and a mechanism that can be quickly and easily deployed and utilized by the EVA crew that would serve as the powered lift.