Luna–Aegis Shuttle Dossier
Short-Hop Lunar Shuttle for Surface–Orbit Transfers

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1. Overview

The Luna–Aegis Shuttle, also referred to as the "short hopper," is a reusable lunar lander and surface ferry designed for rapid transfer between Aegis Station in lunar orbit and the Moon's south polar regions. It is optimized for cargo and crew mobility and features a compact design with precision landing, rover docking capability, and minimal surface footprint.

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2. Mission Profile

- Transport astronauts, samples, or cargo between Aegis Station and lunar surface
- Enable direct transfer to/from Aegis-Class Rover without EVA
- Operate in permanently shadowed or rugged polar terrain with autonomous landing
- Provide a flexible, reusable logistics pathway for surface and station operations

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3. Key Features

- Vertical takeoff and landing (VTVL) configuration
- Autonomous or crewed operation modes
- Pressurized cabin with integrated airlock and rover docking interface
- Four-legged landing gear with slope and dust tolerance
- Designed for compatibility with Aegis-Class Rover docking system

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4. Specifications (Concept Phase)

Parameter	Value / Estimate
Crew Capacity	Up to 2 (pressurized)
Cargo Capacity	Up to 1,000 kg payload
Total Height	~6.5 meters
Footprint	~4.5-meter diameter landing zone
Docking Interface	Aft or lower hatch, soft seal
Flight Range	Low lunar orbit to surface (round trip)
Reusability	5–10 sorties minimum (baseline)

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5. Docking & Payload Transfer

The shuttle is equipped with:

- A soft-docking interface compatible with the Aegis-Class Rover's suitport or rear airlock
- Pressurized tunnel or telescoping collar with dust seals
- Optional robotic assist arm for autonomous cargo handoff

Cargo modules may include:

- Sample return containers
- ISRU resource tanks (e.g. ice/water)
- EVA tools, drone deployers, or scientific instruments

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6. Landing System & Autonomy

- Quad landing legs with adaptive footpads and thermal shielding
- Terrain-scanning radar and hazard-avoidance lidar for pinpoint descent
- Software tie-in with Aegis Station and lunar surface maps
- Redundant RCS and thrust vectoring for attitude control

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7. Integration

- Designed to operate from Aegis Station docking arm or external cradle
- Autonomous rendezvous and docking with station or orbiting cargo modules
- Ground-side reloading and refueling possible at RON or other surface nodes

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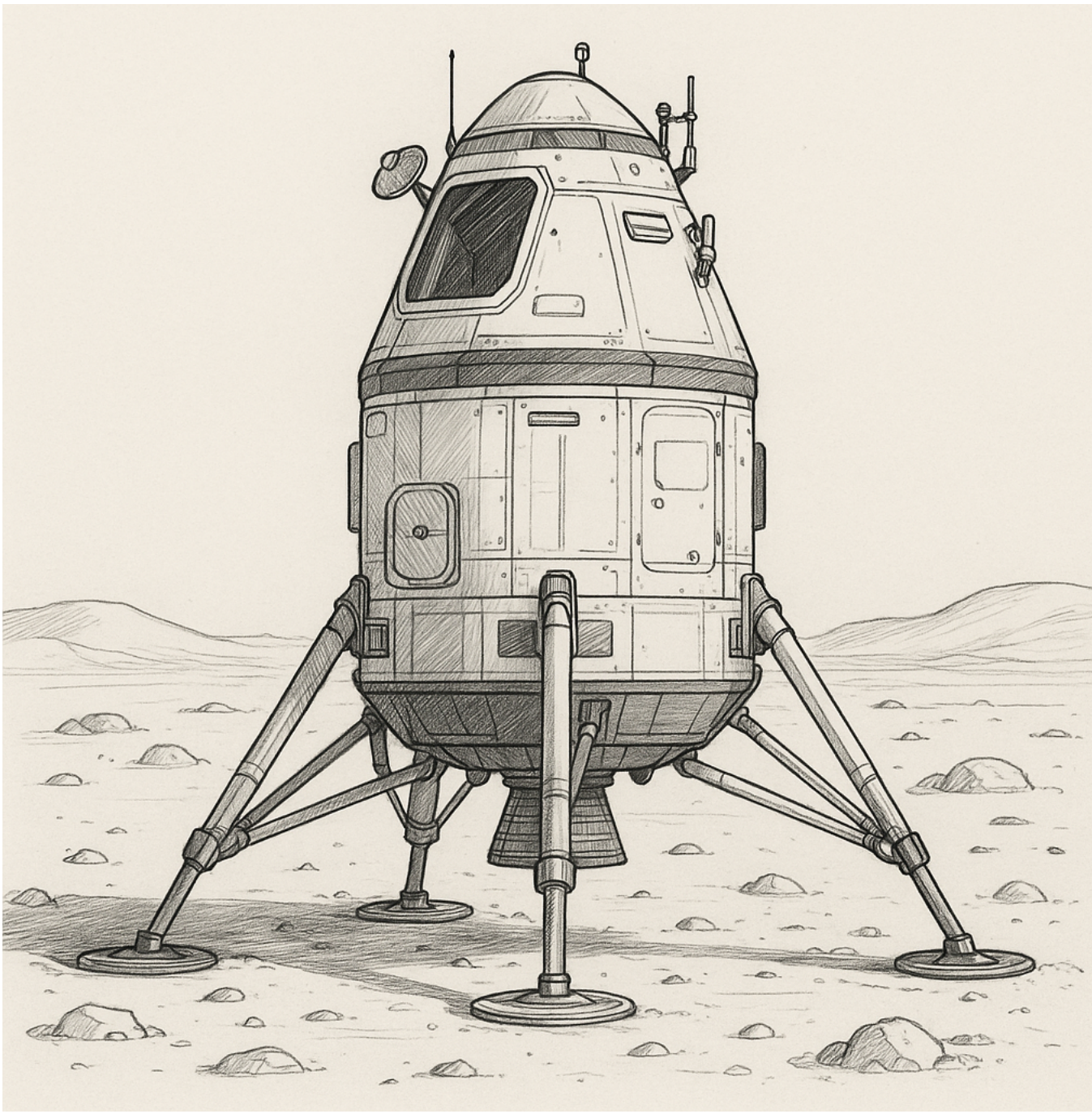
8. Concepts

- 

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