

Aegis-Class Rover Dossier

"Bob's Rover" – A Pressurized Mobile Platform for Lunar Resource Exploration

1. Overview

The Aegis-Class Rover is a self-contained, rugged, pressurized vehicle designed to support long-duration surface operations on the Moon. Tailored for polar exploration and the lunar water mining frontier, it serves as a mobile stronghold for scouting, prospecting, and transport missions — and is engineered to operate safely and autonomously in some of the harshest terrain in the solar system.

2. Key Capabilities

- Pressurized cabin with full standing room for 2–3 astronauts
- Autonomous and manual hybrid operation modes
- RTG-assisted survival mode; battery-swap recharging architecture
- Capable of navigating polar slopes, ice shelves, and deep craters
- Integrated robotic arm and modular tool system

3. Specifications

Feature	Specification
Length	~6.5 meters
Width	~2.8 meters (3.5 meters with wheels)
Height	~2.7 meters
Mass	4,000–5,500 kg
Range (Full Pack)	~300 km
Life Support	48–72 hours (extendable)
Primary Power	Swappable Li-ion or solid-state packs
Secondary Power	Compact RTG (~200W)

4. Interior Layout

See: [Interior Cutaway Placeholder]

Forward Zone (Cockpit & Control)

- Dual crew seats with panoramic window or digital interface
- Redundant manual, voice, and touchscreen control interfaces
- Mission AI system with terrain and system overlays

Mid-Zone (Crew Space)

- Standing work area with fold-out benches and bunks
- Galley unit with water and ration rehydration
- Waste management unit with privacy screen

Aft Zone (Airlock & Suitport)

- One or two-person airlock with suitport integration
- EVA prep staging, tool anchors, glove storage

Life Support & Storage

- CO2 scrubbers, O2/N2 tanks, and thermal management
 - Underfloor tool lockers and emergency supply bins
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5. Field Navigation System

The rover's navigation suite fuses terrain awareness, AI-assisted pathfinding, and real-time hazard detection.

Navigation Stack:

- Inertial navigation system (INS)
- Visual odometry (VO)
- Wheel and articulation sensors

Terrain Awareness:

- Stereo cameras and terrain classification AI
- Ground-penetrating radar for subsurface safety
- Dynamic replanning and route adjustment

Mapping & Control:

- Orbital terrain map integration
- Landmark-based localization
- Optional deployable beacon network

Operator Interface:

- In-cabin HUD and remote override system
 - Latency buffering for lunar-Earth control
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6. EVA Compatibility

The Aegis-Class Rover is optimized for regular EVA operations with a dedicated airlock, external suitports, and real-time navigation aids.

Access & Mobility:

- External suitports with integrated dust mitigation
- Airlock cycle time of 3–5 minutes
- Ladders, handholds, and tether points

Navigation & Safety:

- Helmet AR integration via HUD overlay
- Mesh comms network for voice/data
- Deployable beacon system for EVA navigation

Tools & Emergency Support:

- External tool lockers and fold-out work tray
 - External O2 refill port
 - Emergency thermal alcove and assist drone (optional)
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7. Rover Operations Node (R.O.N.)

See: [RON Cutaway Placeholder]

RON is a fully autonomous support station designed to sustain Aegis-Class Rovers in lunar polar operations. It provides:

- Battery charging and hot-swapping (gantry robot system)
 - Thermal regulation for battery longevity
 - Robotic diagnostics and dust cleaning
 - High-gain uplink and local coordination relay
 - Modular expansion for mining, habitation, or sample return
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8. Tooling & External Systems

- Robotic manipulator arm with swappable heads (drill, scoop, gripper)
 - Ground-penetrating radar and multispectral sensor mast
 - Sample and water tank racks
 - Foldable solar panels (optional)
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9. Mission Use Cases

- Polar ice scouting and sample return
 - Long-range terrain mapping
 - EVA staging and mobile science platform
 - Water transport or mining support
 - Emergency shelter in remote regions
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10. Visual Placeholders

- [Placeholder: Exterior Profile Illustration]
 - [Placeholder: Interior Layout Cutaway]
 - [Placeholder: R.O.N. Base Cutaway]
 - [Placeholder: Navigation Interface Mockup]
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