

Construction & Deployment Logistics

Building Aegis Station in Stages

Overview

Aegis Station is a modular world—constructed ring by ring, piece by piece. It doesn't require full completion to begin operations. This approach enables early science, early habitation, and early revenue.

Assembly Plan

Stage 1: Earth Launch and Orbital Assembly

- Modules launched to **low Earth orbit (LEO)** via heavy-lift vehicles
- Dry components only—no water until lunar orbit
- Segmented ring sections, central hub trusses, and systems bays assembled robotically or by crew
- Rings constructed independently to reduce schedule risk

Stage 2: Tug Transfer to Lunar Orbit

- Completed ring modules are moved to **lunar orbit** via electric tugs or hybrid propulsion stages
- Non-rotating hub remains in microgravity throughout
- Each ring is spun up **only after orbital installation**

Stage 3: Shielding Operations

- Once in lunar orbit, shielding begins using lunar-sourced water
 - Tankers deliver directly to shield reservoirs embedded in the outer hull
 - Shielding is done **per ring**, enabling operation before full station fill
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Phased Ring Activation

Each ring is a **self-contained system**:

- Independent pressurization and life support
- Local power and crew quarters

- Dedicated thermal and ECLSS subsystems
- Physical separation ensures fault tolerance and safety

This means:

- **Ring A** can be inhabited and operational **before Ring B and C are completed**
 - Early ring can serve as a pilot program, testbed, or limited-function habitat
 - Initial crew (science, construction, systems) supports both habitation and expansion
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Shielding Timeline and Integration

- Each ring's shielding volume: ~550,000 tons of water
 - With a 30-tanker fleet moving 900 tons/day, each ring takes **~1.6 years to fully shield**
 - Shielding begins immediately upon orbital arrival
 - Rings may begin partial operations once **lower decks are shielded**, extending protection upward
 - Fleet continues in parallel across multiple rings
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Construction Cost Breakdown

| Component | Estimated Cost |
|-------------------------------|-----------------------|
| Launch and dry mass to LEO | ~\$300 billion |
| Tug transfers to lunar orbit | ~\$10–30 billion |
| Lunar water sourcing and fill | ~\$250 billion |
| Total (Phase 1–3) | ~\$560 billion |

Includes station dry mass (~120,000 tons), shielding mass (~1.65M tons), and all transfer/assembly stages.

Why This Works

- Spreading deployment reduces schedule and budget pressure
 - Early activation of Ring A proves out systems and delivers value
 - Risk containment: problems in one ring don't affect the others
 - Modular shielding allows gradual buildup of protection and infrastructure
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Operational Timeline (Revised)

| Year | Milestone |
|------|--|
| 1 | Launches of dry ring modules begin |
| 2 | Assembly of Ring A in LEO complete |
| 3 | Ring A moved to lunar orbit |
| 4 | Ring A begins shielding, early operations |
| 5 | Ring A partially shielded; Ring B underway |
| 6 | Ring B arrives; shielding begins |
| 7–8 | Ring C in LEO; crew scaling begins |
| 10 | Full shielding and activation complete |

This phased model is **flexible, redundant, and resilient**—all core to Aegis Station’s design philosophy.