



Aeronautics

Hovercraft Landing System

Movable ground based recovery system for recovery system for reusable space flight hardware

Reusability for spacecraft and launch stages is the key to minimizing the costs of spaceflight. The hovercraft recovery system technology makes possible space vehicle reusability while preserving the high performance and low complexity of expendable space vehicles. This approach uses a highly maneuverable hovercraft with a cushioned landing platform. The space vehicle descends into the landing zone on a parachute and lands on the hovercraft platform that actively maintains a position directly under the returning vehicle. This technology opens up the possibility of a low cost approach to evolving existing expendable space vehicles to highly competitive reusable spaceflight vehicles.

BENEFITS

- Low cost approach to spacecraft reusability
- Low performance impact approach to spacecraft reusability
- Dry Landing at existing ocean landing sites
- Enables evolution of existing expendable space vehicles to reusable space vehicles

technology solution



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THE TECHNOLOGY

The hovercraft is deployed into the planned landing zone prior to the space vehicles return and tracks the returning vehicle as it approaches the landing zone. Once the space vehicle deploys its parachute at high altitude the hovercraft travels at its top speed to the vehicles location and positions itself directly underneath. The hovercraft uses directional thrust to actively maintain a position directly under the uncontrolled descending vehicle, compensating for wind drift, parachute swing, wind gusts, and ocean currents. The hovercraft is designed with forward/aft/left/right propulsion for high maneuverability. The hovercraft is covered by a cushioned landing platform that minimizes the landing loads on the space vehicle. Once landed, the parachutes are released and the landed vehicle is secured and covered. Existing ocean going hovercraft using similar technology (i.e. NAVY LCAC) are capable of speeds over 50 mph. The combination of low landing loads, no emersion in water, proven parachute decent system, and use of existing landing zones make the hovercraft landing system a low cost system approach to reusability that is competitive with other reusable space vehicle systems that incorporate the landing systems into the flight vehicle.



The hovercraft recovery system technology makes possible space vehicle reusability while preserving the high performance and low complexity of expendable space vehicles

APPLICATIONS

The technology has several potential applications:

- Launch vehicles or spacecraft, manned or unmanned
- Government or commercial space endeavors

PUBLICATIONS

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National Aeronautics and Space Administration

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