



ENGINEERING MISSION SUCCESS

Aerospace Engineering Disciplines

Guidance, Navigation, and Control

> Autonomous Rendezvous and Docking

Computational Fluid Dynamics

Thermal Modeling and Analysis

Structural Analysis and Mechanical Simulation

Space Systems Engineering

Payload Integration and Integration Support

Launch and Space Operations Planning

Key Technologies

Advanced Video Guidance Sensor (AVGS)

Wide-Angle Laser Rangefinder

ULTOR(TM) Digital Correlator

Common Berthing Mechanism

Manual Berthing Mechanism

APAS

Low-Impact Docking System

Program Experience

DART

Orbital Express

Alternate Access to ISS

Orbital Space Plane

Crew Exploration Vehicle

Rocketplane XP Suborbital Space Plane

X-37

About bd Systems

bd Systems is a woman-owned small business that provides engineering and information technology services for government and private industry. Based in Torrance, California, bd Systems has over 20 operating locations nationwide.

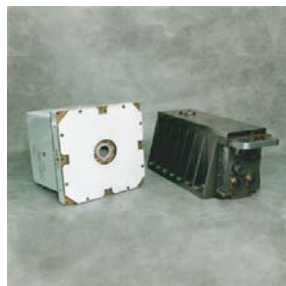
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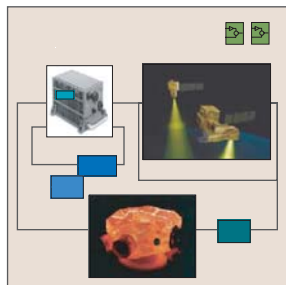
Autonomous Rendezvous and Docking (AR&D)

bd Systems and Advanced Optical Systems have over 25 years of engineering leadership experience supporting technologies necessary to deliver a robust AR&D capability. Our combined team, located in Huntsville, Alabama, stands ready to support AR&D needs. Our relevant experience and expertise includes:



Sensors & Navigation

- Advanced relative AR&D sensor and target system development.
- Common electronics processor for integration of multiple sensor heads.
- Robust Kalman Filter algorithms for sensor fusion.



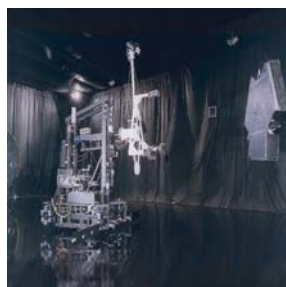
GN&C & 6DOF Simulation

- Six-degree-of-freedom simulated AR&D trajectory generation.
- Closed-loop guidance algorithms from launch to final hard dock.
- Advanced control algorithms to increase performance and robustness.
- Expertise with the ISS visiting vehicle interface definition document.



Docking Mechanisms

- Expertise with various NASA docking mechanisms.
- High-fidelity contact dynamics model development.
- Structural loads and dynamics analyses across vehicle docking interfaces.
- Hardware-in-the-loop dynamics simulation development.



Test & Evaluation

- Digital Monte Carlo dispersion analysis.
- Extensive experience using MSFC world-class facilities for rendezvous, docking/berthing system testing.
- Hardware-in-the-loop avionics test design and support.
- Navigation sensor hardware testing.

bd Systems' partnership with Advanced Optical Systems delivers advanced AR&D solutions.

