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Autonomous Rendezvous and Docking -
A Commercial Approach To On-Orbit Technology Validation

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ABSTRACT

The Space Automation and Robotics Center (SpARC), a NASA-sponsored Center for the Commercial Development of Space (CCDS), in conjunction with its corporate affiliates, is planning an on-orbit validation of autonomous rendezvous and docking (ARD) technology. The emphasis in this program is to utilize existing technology and commercially available components whenever possible. The primary sub-systems that will be validated by this demonstration include GPS receivers for navigation, a video-based sensor for proximity operations, a fluid connector mechanism to demonstrate fluid resupply capability, and a compliant, single-point docking mechanism.

The focus for this initial experiment will be expendable launch vehicle (ELV) based and will make use of two residual Commercial Experiment Transporter (COMET) service modules. The first COMET spacecraft will be launched in late 1992 and will serve as the target vehicle. The ARD demonstration will take place in late 1994, after the second COMET spacecraft has been launched. The service module from the second COMET will serve as the chase vehicle.