Spacecraft Robotic Capture Tool

* John Ratti (MDA), Richard Rembala (MDA)

Contact Author: John Ratti
Affiliation: MDA
Address: 9445 Airport Road, Brampton, Ontario, L6S 4J3, Canada
Email: john.ratti@mdacorporation.com
Phone: (905) 790-2800, ext. 4604
FAX (optional): (905) 790-4400
Presentation Preference (oral or poster): oral
Keywords (no more than 5): Robot, Tool, Free-Flyer, Capture, Debris

---

Extended Abstract

As the space industry moves towards a vision of orbital debris mitigation and de-orbiting, the capture of free-flying spacecraft will need to grow in capability. Over the past 30 years, through the Space Shuttle and Space Station programs, as well as through servicing flight experiments and tests, many free-flyer captures have successfully been performed. All of these, however, have had the advantage of a co-operative spacecraft, designed to be captured through grapple fixtures, targets, and other specially-designed hardware.

Orbital debris mitigation will involve the capture of un-co-operative and unprepared satellites and upper stages. Since these are not equipped with robotically-compatible hardware, another suitable capture interface must be used.

The Launch Adapter Ring (LAR) interface is an excellent candidate interface, featuring well known geometry, strength and stiffness, and accessibility.

As part of the CSA's Space Technology Development Program, MDA is developing a Launch Adapter Ring Capture Tool. Designed to be compatible with on-orbit autonomous robotic operations, the Tool is compatible with multiple LAR diameters and profiles, incorporates a vision system, and will enable the capture of debris mitigation targets.

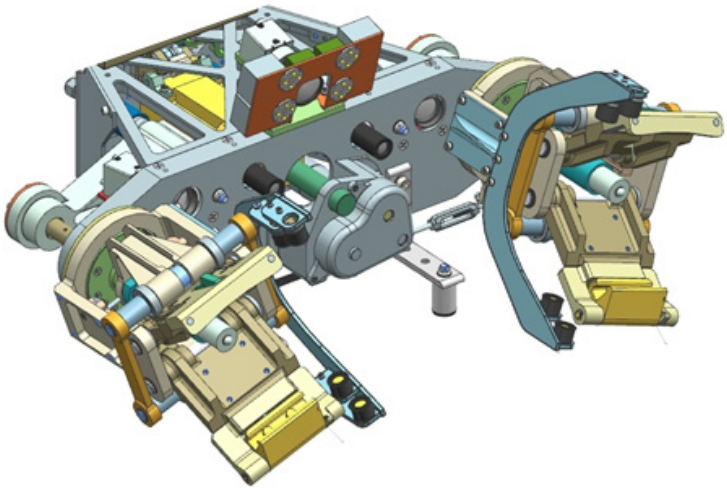

Figure 1: The LAR Capture Tool