

SPACE DEBRIS SYMPOSIUM (A6)

Poster Session (P)

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A COLLABORATIVE APPROACH TO SPACE DEBRIS MITIGATION USING DE-ORBIT KIT TECHNOLOGY

Abstract

Together we have worked to produce this research paper, with the aim of presenting an analysis of the important and difficult challenges faced in finding a solution to the problem of space junk. Based on the findings of this analysis, we will propose some new technologies and a methodology for its use and further development. We have come together to create something of a permanent solution to these challenges faced when trying to mitigate the risks associated with space debris and space junk.

Man made orbital debris continues to pose a threat to manned and unmanned missions in Earth orbit. Not only does the problem of orbital debris put at risk man made craft, it also endangers the lives of passengers in current and future manned spaceflight. An analysis of currently proposed methodologies for orbital debris mitigation and space remediation was compiled and an evaluation of their potential applications was performed. The analysis covers a broad spectrum of proposed solutions for a variety of different types of orbital debris.

During our analysis the realization was made that the highest concentration of defunct satellites is found in Low Earth Orbit (Henceforth referred to as L.E.O.). Also determined was that current methodologies proposed for de-orbiting satellites in L.E.O. were mostly designed for de-orbiting a single space craft per mission. This helped narrow our search for a solution.

We began developing a methodology with the primary objective of de-orbiting multiple defunct space craft within the scope of a single mission. We would propose a technological solution in the form of a satellite system, serving as a delivery unit which houses a plurality of remote operated, self-attaching de-orbiter modules. These are assisted in deployment via robotic arms which are fixed to the delivery satellite chassis.

This delivery system would be able to service multiple missions and is designed to be re-useable, as well as being compatible to existing infrastructure. Its on-board systems allow controlled, monitored de-orbit of space debris. This methodology and technology aims to provide a new method for safely de-orbiting space debris.