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ATMOSPHERIC PARACHUTE TEST VEHICLES - PAST, PRESENT AND FUTURE

Abstract

Flight testing has been an integral part of space flight missions since the start of space flight. Parachutes have been tested using various methods such as wind tunnels, low and high altitude drop, and flight testing in both sub- and supersonic regimes. The different methods have their advantages and disadvantages. This paper aims to give an overview of various flight test missions flown in the past, their chosen test method, and why they were chosen over other test methods.

This paper shows an analysis of previously performed tests ranging from low altitude flight to high altitude flights on dedicated rockets. It compares the test conditions of the missions to their complexity. Where possible and available, the cost estimate of a flight is included to support the trade-off. The objective of this paper is to help gain an understanding of how parachute flight testing evolved over time, what the added value is to the knowledge of Entry Descent and Landing (EDL) systems, and to help compare the various testing methods for future research.

Based on the trends observed over the recent years and plans for future missions, the paper presents an extrapolation of the needs in parachute testing. These trends are coupled with currency developments in technologies to help define future parachute test missions.