23rd IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4) Access to Space for Small Satellite Missions (5)

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SMALL LAUNCH VEHICLES - A 2016 STATE OF THE INDUSTRY SURVEY

Abstract

The first half of the 2010's has seen a dramatic increase in potential small launch vehicle contenders, defined as rockets capable of carrying at most 500 kg to Low Earth Orbit. Spurred on by government programs such as Falcon and ALASA and the rapid proliferation of CubeSats and nanosatellites, over 25 different commercial, semi-commercial, and government entities worldwide are now working on new entrants of this class. To date the most successful small launcher, the Orbital ATK air-borne Pegasus has launched 42 times, but its flight rate has dropped to less than one a year in the last ten years. The SpaceX Falcon 1 appeared to be poised to enter this market, but was abandoned in 2009. At the same time ride-share opportunities on ESPA rings, shared microsatellite launches, or as cargo to the International Space Station have proliferated. Despite this seemingly bleak market environment new entrants promise to have a first flight as soon as this year.

This paper will present an overview of all publicly acknowledged small satellite launch systems. We will compare capabilities, stated mission goals, program timeline, and cost where available. Patterns and trends will be identified in an effort to show how many, if any, of these new systems are likely to survive, let alone thrive. Has the era of small launchers finally come, or will the cost and harsh realities of rocket physics stop this trend before its first launch?