

23rd IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Generic Technologies for Small/Micro Platforms (6A)

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CARBONITE-1: ONE YEAR OF HIGH RESOLUTION VIDEO IMAGING

Abstract

Emerging Earth Observation (EO) programs are focused on large low-cost constellations, with an emphasis on reduced revisit time, using 50-100 kg platforms. In such programs, mass-manufacturable-capability cannot be treated as an afterthought, but must be brought into the early stages of system design, planning, and scheduling. The manufacturing, integration, and testing process must all be streamlined in order to not only deliver a fleet of satellites on time, but to do so in a cost efficient manner to make the large envisioned constellations viable.

SSTL has been investigating ways in order to improve its mass manufacturing capability to make it more streamlined. Though SSTL has delivered 46 satellites over the past 30 years, these large constellations will require 50-100s of satellites within a couple years in order to close their business case. Therefore, a change is required that takes advantage of modern automated manufacturing and testing techniques. This will allow significant savings in production costs and schedule that can help make large scale constellations viable.

Carbonite is a series of missions to push the envelope of small satellite performance and schedule delivery. Carbonite-1, in particular was designed to demonstrate rapid-build techniques and to test COTS components and new avionics in orbit. It was the 1st generation satellite on a roadmap to develop a new product at a low price point to deliver high resolution imagery and video within a shortened delivery schedule. Launched in July, 2015, the satellite has been operational since and has demonstrated the rapid response capability of SSTL. This paper will highlight the design, process followed, lessons learned, and results from the past year of high resolution video imaging operations in orbit.

This paper could also be appropriate for session B4.4.