

26th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Generic Technologies for Small/Micro Platforms (6A)

Author: Dr. Benoit Larouche
Space Flight Laboratory, University of Toronto, Canada, blarouche@utias-sfl.net

Dr. Robert E. Zee
University of Toronto, Canada, rzee@utias-sfl.net
Mr. Braden Hommy
Space Flight Laboratory, University of Toronto, Canada, bhommy@utias-sfl.net

DEFIANT: SUPPORTING SMALL SATELLITE CONSTELLATIONS THROUGH RAPID
DEVELOPMENT AND CUSTOMIZATION

Abstract

The DEFIANT platform is a scalable and modular satellite currently accommodating a multitude of constellation missions with short development cycles, complex requirements, varied payloads, and high on performance demands. The key to its popularity is its ability to pack micro-satellite performance into a nano-satellite scale.

Sized to take advantage of the smallest and lightest COTS separation systems while providing a much higher payload fraction than traditional nanosats, the system offers leading volume and mass performance. Furthermore the deployable solar arrays and 1U width inter-avionics space of the system provides a large amount of range in performance and payload variability for advanced missions. On the other hand, the overall size (40.5 U) and mass (30 kg) come in well below traditional microsats and provide launch flexibility and affordability. Lastly, a robust modular design creates a rapid and streamlined assembly procedure which has parallel integration possibilities and easy-/late-access for nearly all subsystems. Debuted less than a year ago, the platform has already been chosen for several constellations taking full advantage of the breadth of the system's design capabilities.

This paper will present the construction and qualification of three separate versions of the platform currently being used for two separate constellation missions; one commercial constellation mission and one arctic surveillance demo mission, demonstrating the flexibility and range of the design. Both of these missions are slated for late 2019 and early 2020 delivery of the flight spacecraft. The test results will also be correlated to the analysis and design of the system in order to validate the approach and detail both mission goals leading to the variations of the final product.