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EXPERIENCE WITH THE MARITIME MONITORING AND MESSAGING MICROSATELLITE (M3MSAT)

Abstract

The Maritime Monitoring and Messaging Microsatellite (M3MSat) is a technology demonstrator mission that will contribute to solving the current difficulties of Canadian maritime surveillance faced by the Canadian Armed Forces (CAF). M3MSat is a joint project between the Canadian Space Agency (CSA), Defence Research and Development Canada (DRDC) and is manufactured by COM DEV International Ltd. (with support from the University of Toronto Institute for Aerospace Studies).

Weighing less than 100 kilograms, M3MSat will be used to evaluate the ability to perform high performance space-based detection of ship transmitted AIS (Automated Information System) signals in dense shipping regions of the Earth. The microsatellite will also perform global "blue water" maritime surveillance. Integration of the information gathered by the satellite into a Recognized Maritime Picture will make it possible to identify and record marine traffic, determine the direction and speed of vessels ensure that ships are travelling legally through Canadian waters, and help ensure safety of life at sea. This will ultimately serve to protect public security, national interests, and global operations by improving ISR within Canada.

In addition to the AIS data exploitation, the developmental experience with M3MSAT will further increase DRDC's expertise in small satellite system design and operations. M3MSat is currently scheduled to launch in June 2014. This paper will present the initial performance of the satellite system with respect to platform attitude stability, ground infrastructure robustness and automation processes effectiveness, mission planning system, system duty cycle, data latency, AIS detection, and data management. Furthermore, it will highlight lessons learned through the satellite development, Launch and Early Operations Phase, commissioning and operations. Lastly, it will recommend how those lessons learned could be integrated into the development of future CAF space systems.