

EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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MDA SUB-METRE OPTICAL IMAGING SYSTEM – HIGH PERFORMANCE AT LOW COST

Abstract

MDA is in the process of developing its next generation of smallsat based optical imaging systems targeted at providing exceptional imaging performance at low cost. The development program has been targeted at the following key areas: 1) the optical camera technology which is being developed together with the Rutherford Appleton Laboratory (RAL) in the UK, 2) the data handling downlink system that can accommodate the very large data rates, provide multi-terabit on-board storage at very low power, and high data rate downlinks, 3) an agile spacecraft bus that is highly compact with a unique configuration to accommodate the camera, and 4) the ground segment including the image processing to enable providing very high quality imaging products. To achieve the very high performance to cost ratio, MDA is leveraging heavily from the recently launched RADARSAT 2 and RapidEye missions (for which MDA was prime contractor), from the image processing ground segments developed for the Worldview and GeoEye high resolution imaging systems, and also from the camera technology developed by RAL for the Topsat mission launched in 2005. The system contains a number of innovations that are presently in the process of being patented.

This paper will describe the overall system architecture and the design of each element including the hi-res optical camera, the on-board data handling system, the spacecraft bus and the image processing ground segment. This will include a description of the specific innovations that enable the high performance at low cost. There has been significant development work that has been completed to date that includes design and analysis activity as well as hardware development and testing. This will be summarized and the key results given. The performance of the overall system will also be given that addresses the image quality, overall data collection capacity, and the available system operational modes. The system is targeted for launch in the 2013 time frame and is expected to demonstrate a significant advancement in the performance achievable from a low cost small satellite system.