

TacSat-3 Goes From Experiment to Asset



Pictured is the May 2009 launch of an Air Force Minotaur I rocket carrying AFRL's Tactical Satellite-3 and the National Aeronautics and Space Administration's PharmaSat microsatellite and CubeSat technology demonstration. (AFRL image)

AFRL's Tactical Satellite-3 (TacSat-3) made the leap from experimental to operational asset with the June 2010 official transfer of control from the lab to Air Force Space Command at Peterson Air Force Base, Colorado. Since launching in May 2009, the 880 lb satellite has achieved a number of important milestones, not the least of which have involved its validation of first-generation modular bus technology (designed to provide flexibility for successive small-satellite missions) and its success as the premier small-satellite project to employ a formal payload selection process incorporating combatant command suggestions and flag officer panel appraisal. TacSat-3 has accordingly provided a novel set of high-quality, information-rich data that will have ongoing utility—specifically, in quantifying the applicability of imaging spectrometry—in meeting the various demands of future space endeavors.

TacSat-3's origins date back almost 6 years, beginning as part of the Operationally Responsive Space Initiative addressing the military's requirements for rapid, flexible, and cost-effective systems operating in the cosmos. The effort has constituted a historic mission in this respect, from the satellite's initial rapid checkout to its

successful validation of the primary payload ARTEMIS, the Advanced Responsive Tactically Effective Military Imaging Spectrometer. Among the highlights of TacSat-3's nearly 13 months of experimental flight are its involvement with assisting Haitian and Chilean earthquake relief efforts; collecting approximately 2,100 images taken by the ARTEMIS sensor; performing inaugural in-space evaluation and employment of plug-and-play technology for the AFRL-led Space Avionics Experiment; using the Office of Naval Research-sponsored Satellite Communications Package to transmit, within 10 min of call-up, information obtained from ocean-based buoys to a ground station; and assisting in a US Army tactical concept of operations demonstration of a space-based intelligence, surveillance, and reconnaissance system.

TacSat-3 has demonstrated the advantages of hyperspectral information availability for warfighters worldwide. Having accomplished all key program objectives, the pathfinder technology awaits the challenges of the operational arena. The effort, including the invaluable partnership forged between government and industry, exemplifies the feasibility of achieving high-value capability on a small budget and in a short time frame.