

# **NEWS RELEASE**

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## **MICROCOSM AUTONOMOUS ORBIT CONTROL CAPABILITY ACTIVATED ON TACSAT-2**

Hawthorne, CA, May 21, 2007 – Microcosm, Inc., an aerospace engineering firm in Hawthorne, California, today announced that initial testing of its patented autonomous Orbit Control Kit (OCK) capability has been successfully validated on TacSat-2. More extensive testing will occur as the mission continues. Initial results validate the capability of OCK to autonomously correct the satellite orbit to compensate for atmospheric drag.

Traditionally, orbit determination and orbit maintenance functions are performed from a ground station with human operators. Also, traditional methods, with or without Global Positioning System information, control only the spacecraft altitude and possibly eccentricity, but not the in-track position or phase. Thus, the position of the satellite at any given time and when it will pass over any point on the ground is uncontrolled and very difficult to predict in advance due to atmospheric drag variability.

Thus, Microcosm's revolutionary capability to control the spacecraft's orbit autonomously is important for multiple reasons. The satellite's position is continuously controlled, and thus is known in advance, which is particularly important for satellite constellations in coordination with ground activity. Ground operations are simplified -- planning time and the number of replanning cycles are reduced, which ordinarily is one of the most time-consuming (and expensive) parts of mission operations. Propellant usage is decreased, which extends the mission lifetime. Orbit maintenance costs are reduced because maneuvers are calculated and implemented onboard. The complex tracking and communications chain is eliminated, because all other spacecraft, ground

hardware, and data users can know where the satellite is at all times, without continuous communication of ephemeris updates, which reduces system risk by eliminating the potential for operator errors and communications failures. Interference with payload operations is eliminated because orbit control maneuvers are so small that orbit adjustments can be performed while the payload is operational.

The Air Force Space Battlelab in Colorado Springs, CO, provides project oversight and funding for the OCK work through their COMBAT ACLS(Autonomous Control of LEO Satellites) demonstration, and the overall TacSat-2 mission has been funded and managed by the Air Force Research Laboratory in Albuquerque, NM. According to Microcosm Vice President, Dr. Richard Van Allen, “The autonomous orbit control capability represents a major reduction in satellite operational cost and complexity, with applications to both military and civil space missions.”

### **About Microcosm, Inc.**

Microcosm is a small business specializing in space mission engineering and the development of technologies and methods to facilitate more responsive space missions at substantially reduced costs. Microcosm’s three primary business areas include the Scorpius® family of Responsive, Low-Cost Expendable Launch Vehicles; Autonomous Guidance, Navigation and Control Systems; and Space Mission Engineering and Architecting.

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(More information can be found at <http://www.microcosminc.com/ie/ieframesr2.html>, then click on Astronautics Software, followed by Orbit Control Kit)