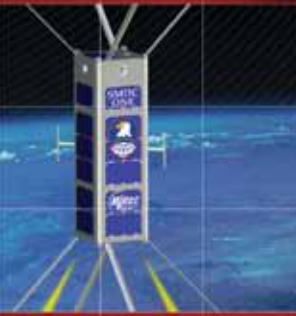




SMDC – ONE

Operational Nanosatellite Effect (Technology Demonstration)

SMDC-ONE
NANO-SATELLITE
Beyond Line-of-Sight Communication



Summary

- 8 nanosatellite technology demonstrators delivered to the Army within 12 months
- Over-the-horizon communications technology demonstrator for tactical forces
- Low cost: Less than \$400K/spacecraft
- Operational life of greater than 12 months in Low Earth Orbit

USASMD/ARSTRAT has successfully demonstrated acquisition responsiveness in rapidly designing and developing a militarily relevant low cost spacecraft in 1 year.

The Technical Center has taken delivery of eight four-kilogram satellites at the end of a one-year contract effort. The first SMDC-ONE nanosatellite will be placed into orbit in 2009 and the remaining seven at a later date. Each of these nanosatellites can be placed into a Low Earth Orbit to receive data files from a ground command and control center. The ground station for the first SMDC-ONE demonstration will be at USASMD/ARSTRAT on Redstone Arsenal, Ala. The primary objective will be to receive data from a ground transmitter and relay that data to a ground station. The intent of this technology demonstration is to build a number of identical satellites and deploy them together into Low Earth Orbit to simulate enhanced tactical communications capability and evaluate nanosat performance.

Operational Nanosatellite Effect (Technology Demonstration)

To achieve enhanced capabilities for the warfighter from space, an approach that holds great promise is the deployment of constellations of nanosat-class satellites into Low Earth Orbit. Because the unit cost for a nanosat is lower (less than \$1M), large numbers for each specific mission can be built and deployed on orbit. What a nanosat may lack in performance and reliability when compared on a per-unit basis to a large traditional military satellite, it makes up by its low cost and constellation proliferation potential.

Nanosats deployed in large numbers can provide enhanced capabilities over large latitudinal swaths of the earth or even globally. Because they are low cost, they can be “refreshed” frequently by launching replacements, which allows rapid technology upgrades, reduces the unit reliability requirements, and allows for manufacturing economies of scale. A nanosat constellation populated by inexpensive spacecraft could be useful in tactical ground operations, humanitarian support, and stability operations. If some satellites are lost, they can be rapidly reconstituted. They can provide coverage over specific regions as well as globally.

The use of nanosats in such fashion will enable UAV-like performance for communication from space-borne assets that can provide data directly into theaters of operation.



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