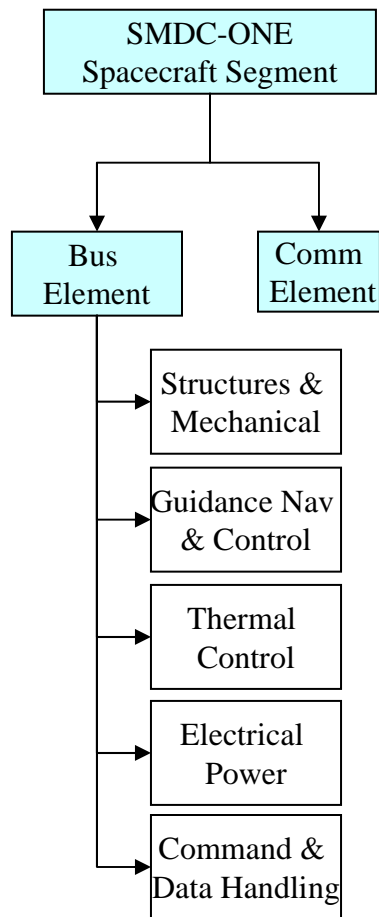


US Army  
Space and Missile Defense Command  
Operational Nanosatellite Effect (SMDC-ONE)



# System Configuration



DEPLOYABLE  
ANTENNA TURN  
STILE

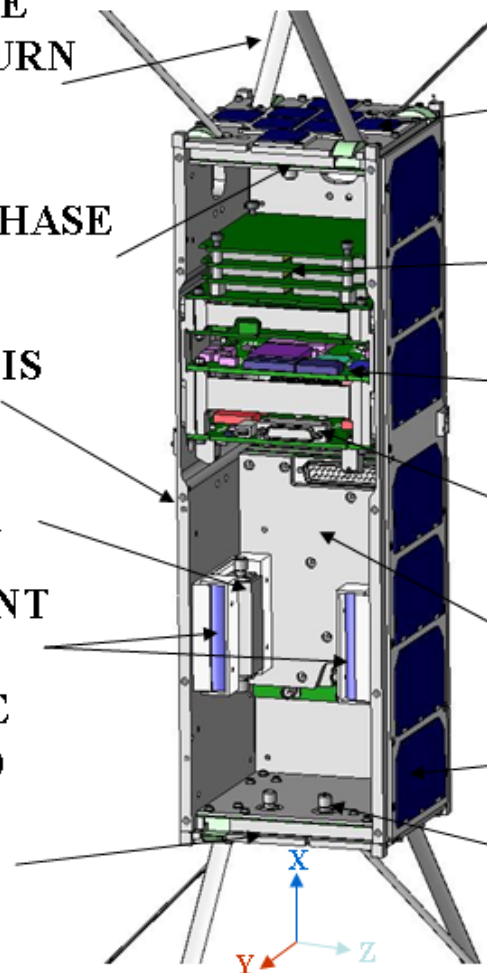
RECEIVER PHASE  
SPLITTER

HYSTERESIS  
RODS

RF FILTER

PERMANENT  
MAGNET  
(ATTITUDE  
CONTROL)

THERMAL  
RADIATOR



END CAP SOLAR  
PANEL

POWER

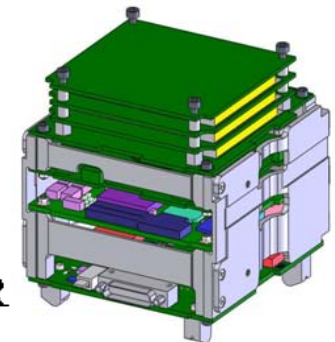
FLIGHT  
COMPUTER

UMBILICAL  
BOARD

PAYLOAD

SOLAR CELLS

TRANSMITTER  
PHASE SPLITTER



PCB  
SUBASSEMBLY

# Mission Objectives

## Mission Objectives

1. Demonstrate the ability to rapidly design and develop militarily relevant low cost spacecraft.
2. Primary Operational Objective
  - a. Scenario OV-1. Receive packetized data from multiple Unattended Ground Sensors (UGS). Transmit that data to ground stations within the SMDC-ONE ground track.
3. Secondary Operational Objective
  - a. Scenario OV-2. Provide real time voice and text message data relay to and from field deployed tactical radio systems.
4. Demonstrate SMDC-ONE operational life time of 12 months or longer.

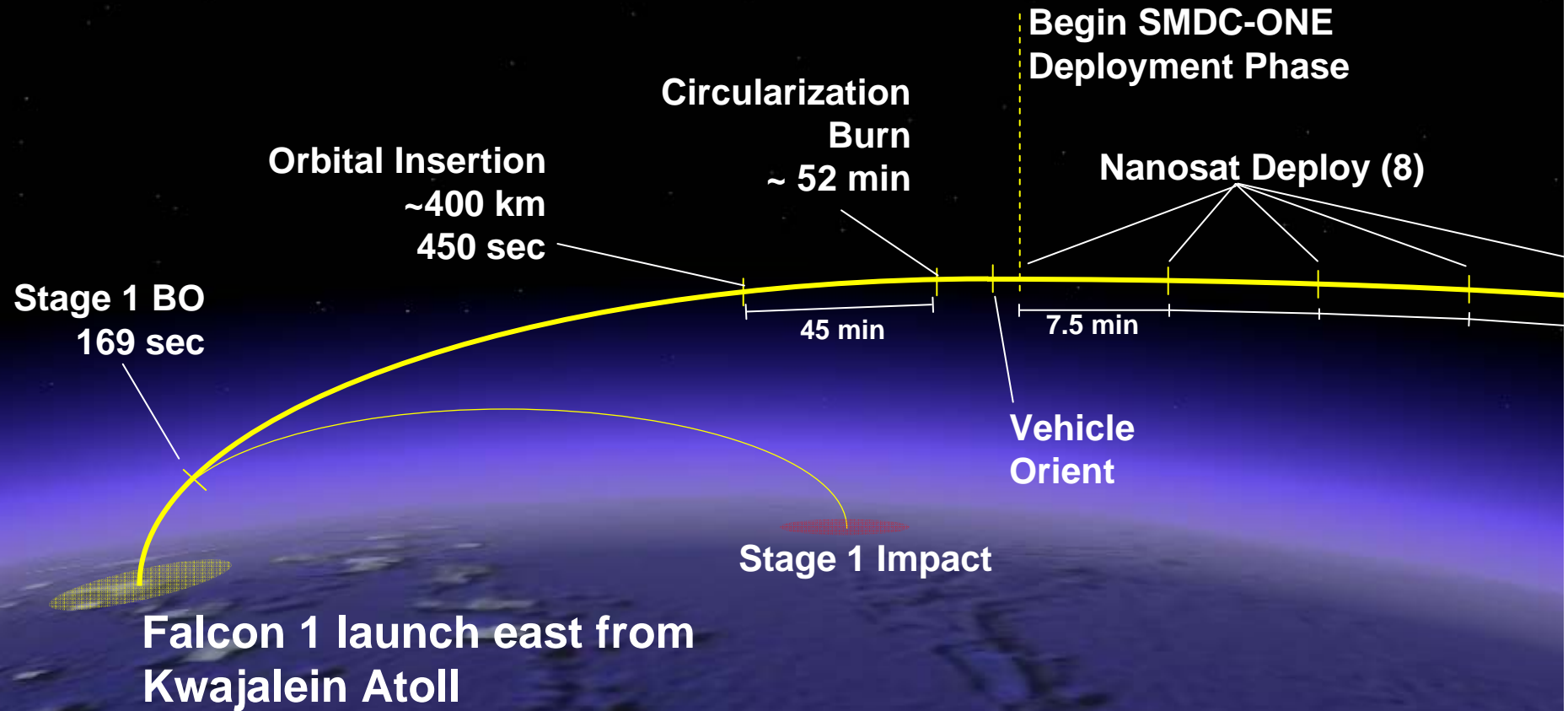
## Minimum Success Criteria

1. Design, develop, and deliver eight SMDC-ONE satellite systems within 12 months of ATP (April 2008) for a hardware cost not to exceed \$350k per satellite.
2. Receive UGS signal on two or more SMDC-ONE satellites and successfully relay that signal to a deployed ground station.\*
3. Not required for mission success.
4. Demonstrate an on-orbit operational life of 6 months or longer.\*\*

•Dependent upon launch of 8 satellites

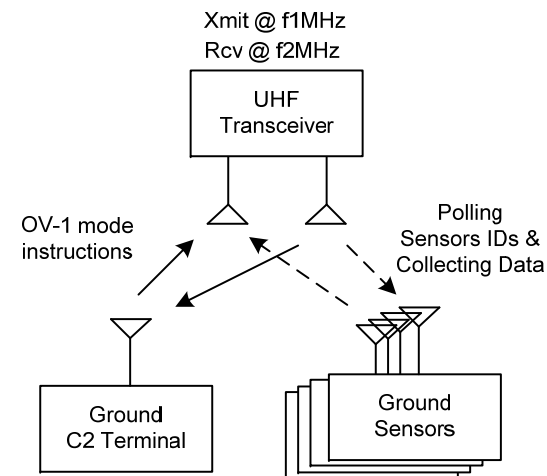
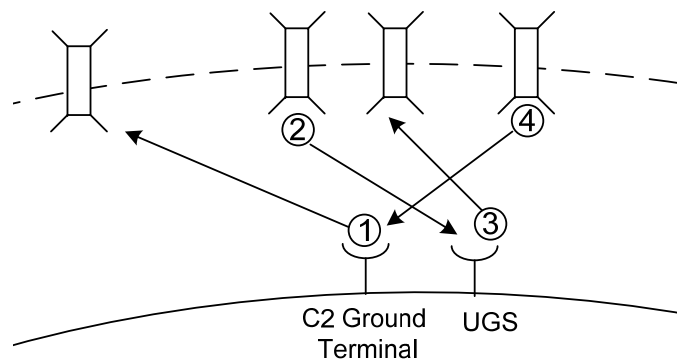
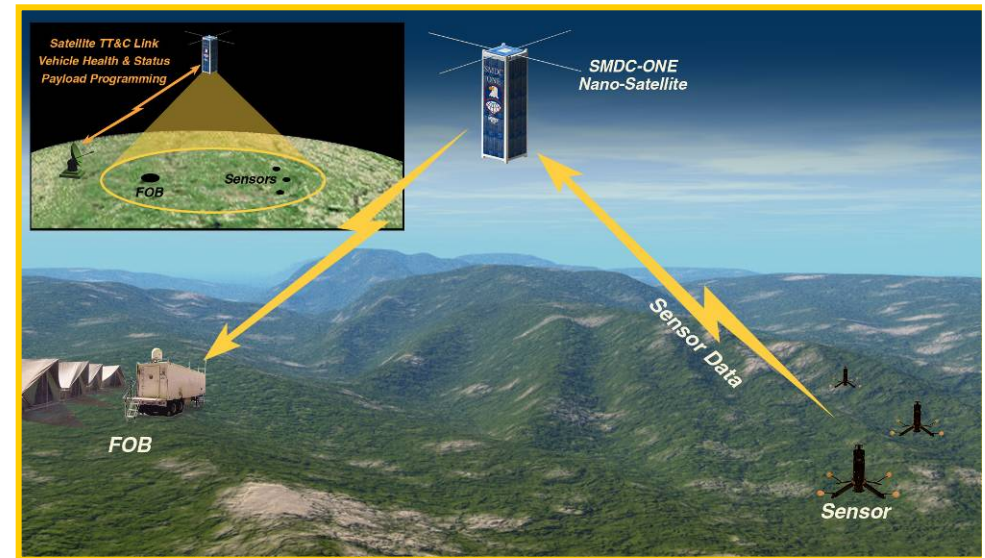
•\*\* Dependent upon assigned orbit

# Design Reference Mission



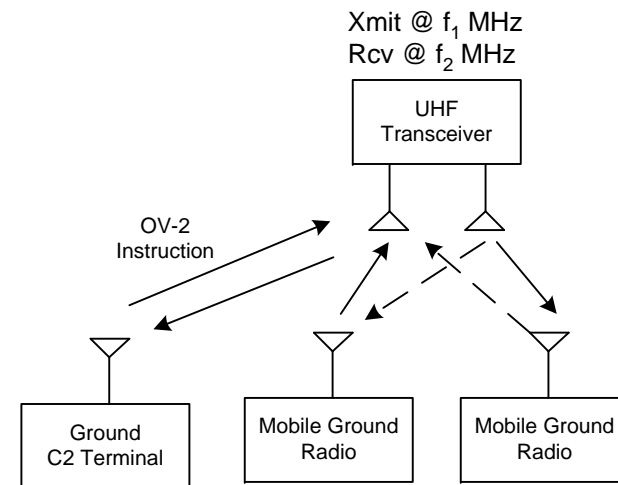
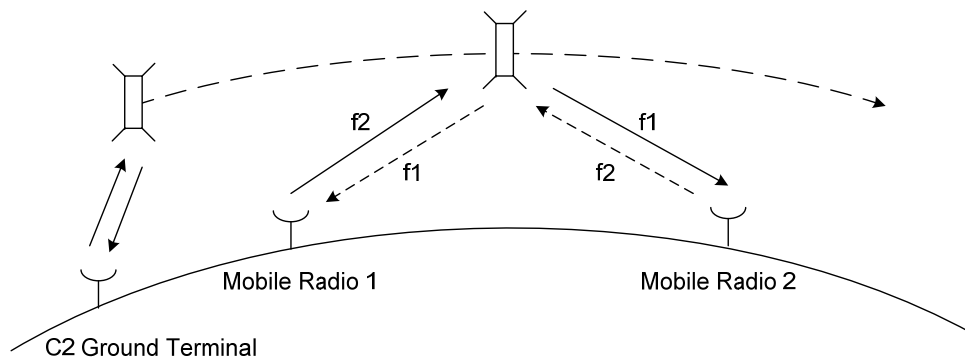
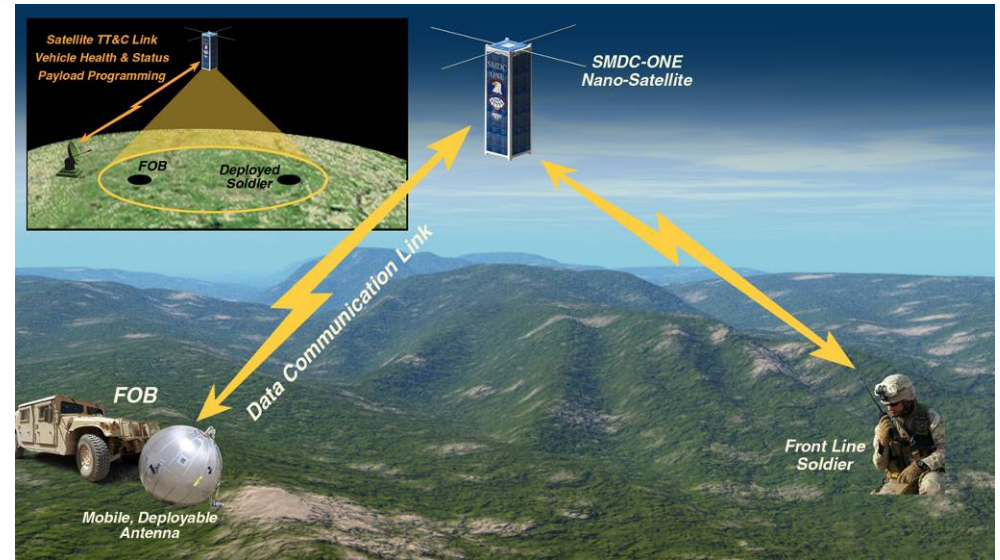
# Primary Mission OV-1 CONOP

- **Satellite-Autonomous Data Collection from Unmanned Ground Sensor (UGS) Segments**
  - Mission Executed From Stored Scheduler or C2 Uplink Instructions “1” Based on Time Schedule
  - Satellite Polls Pre-Loaded UGS ID # “2” on Ground and Retrieves Data
  - Satellite Data Collection from Unmanned Ground Sensors (UGS) “3”
  - Collected UGS Data Transferred to Ground “4”



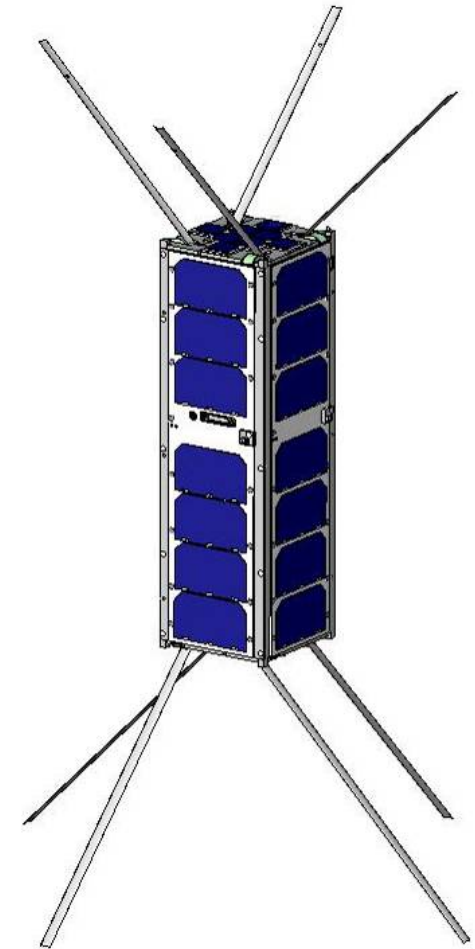
# Secondary Mission OV-2 CONOP

- UHF Data Relay Between 2 Mobile Ground Segments (Radios)
  - Mission Instructions Initiated From Stored Scheduler Events or C2 Re-Schedule
  - Data Text Message Format



## Status as of April 23

- Spacecraft Critical Design Review Completed in December 2008
- Spacecraft Radio Frequency pattern/strength testing completed at AMRDEC Unconventional Beam Office test facility -- Redstone Arsenal, Huntsville.
- Spacecraft Integration and Functional Tests are underway.
- Environmental Test Series
  - Shock test at Marshall Space Flight Center
  - Vibration testing at Miltec Iuka, MS facility
  - Thermal Balance / Thermal Cycling at Miltec Huntsville facility
- US Army Acceptance April 28 at Miltec facility
  - 8 flight units



# Verification Testing

- Shock test at MSFC on two qualification units.
- Random Vibration performed at Miltec luka facility on qual and flight units
- Thermal Balance testing performed on single qual unit as part of thermal cycling test to verify on-orbit predictions
- Thermal Cycling under vacuum on qual and flight units
- Antenna Deployment Test performed as part of thermal vacuum testing
- Antenna Pattern verification to be performed at Redstone Arsenal Army facility using specially designed RF mock-up
- Planning for end-to-end RF test at Redstone Arsenal following delivery.



Shock Test NASA MSFC



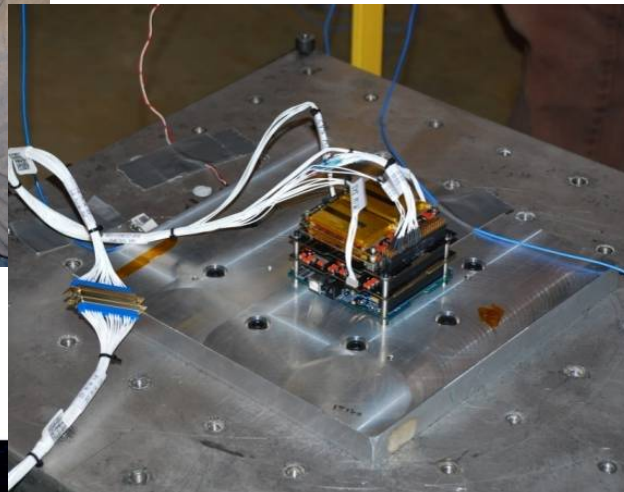
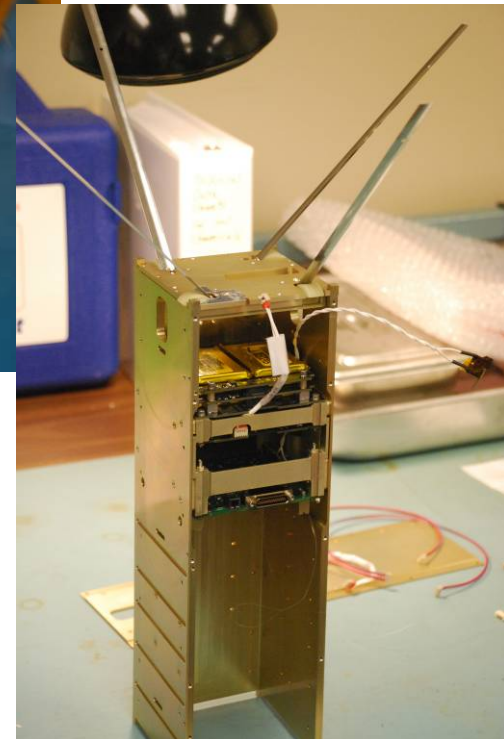
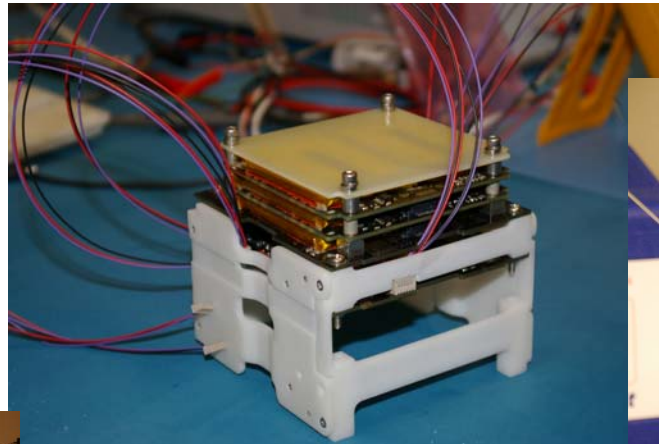
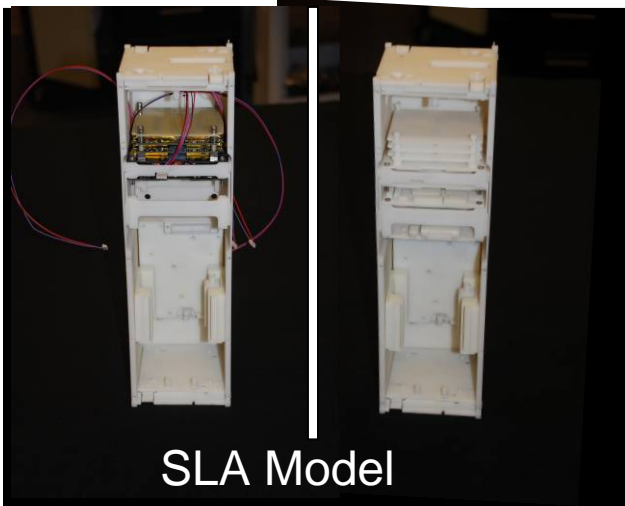
Vibe Test Miltec luka



Thermal Balance / Thermal Cycling  
Miltec Huntsville



# Virtual Tour



# Virtual Tour

