

# High Altitude Long Endurance UAV Hybrid Propulsion System Integration

**Williams Aerospace, Inc.**

**Leilani Williams SVP**

HTDV Project



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# Problem

- Battalion and smaller sized units are increasing use of small UAS
- Small UAS Limited in LOS Comms
- Comms may be blocked by Ground Obstacles
  - Mountains, Hills, Buildings, Trees
- SUAS Endurance is usually relatively short due to current Lithium Batteries

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# Solution

- Snoopy II HALE UAS
  - Serves as comm relay for small UAS
  - Has hybrid propulsion for very long endurance
  - Optics Turret for “Big Look” wide area surveillance



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Snoopy HALE UAV



Comm Relay



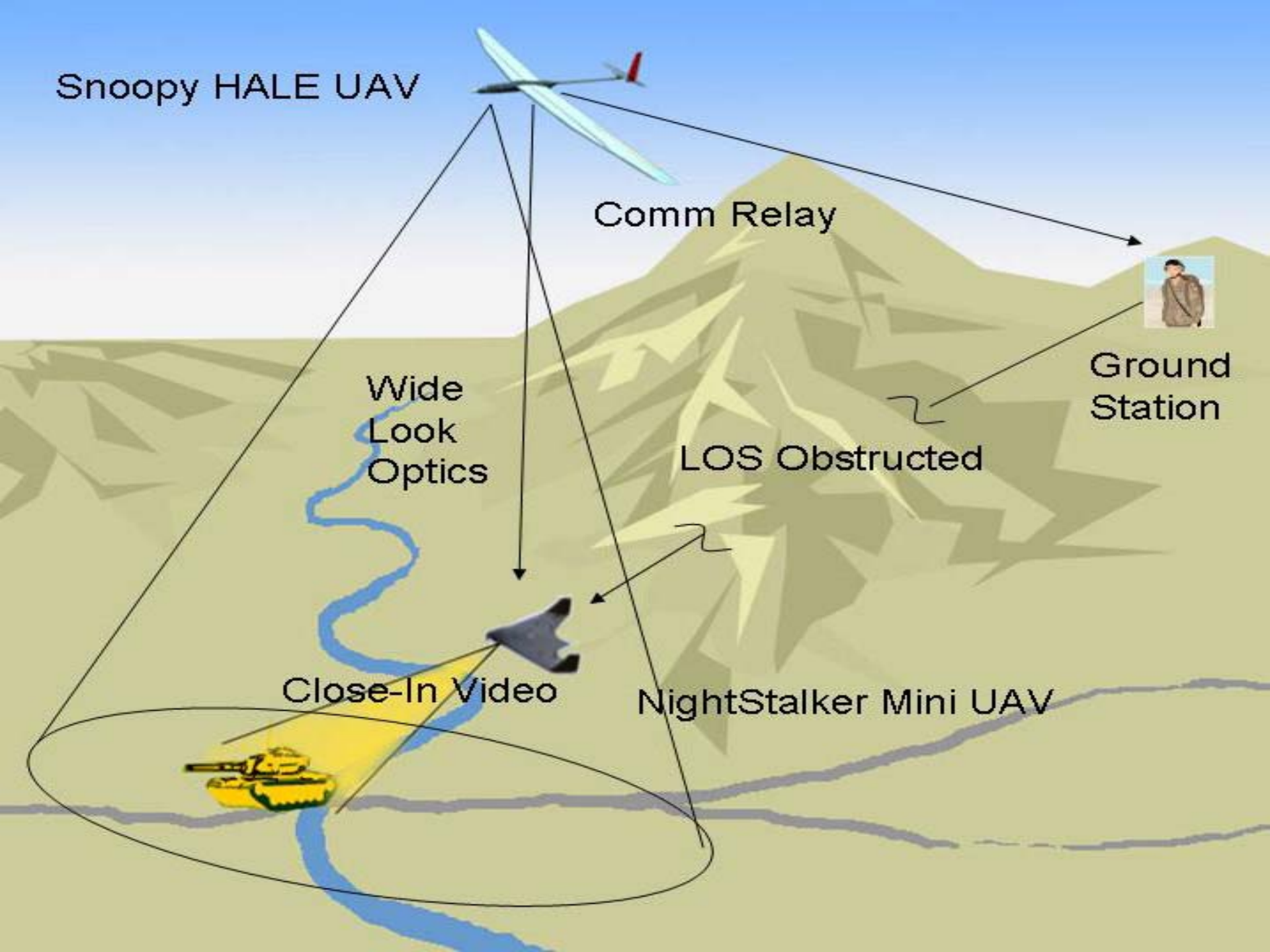
Ground Station

Wide  
Look  
Optics

LOS Obstructed

Close-In Video

NightStalker Mini UAV



# Team

- **Jeff Williams CEO/PRES**
  - 27+ of ISR Experience with Special Mission Aircraft
  - Designer of 4 UAS systems
- **Leilani Williams Senior VP**
  - 10 yrs of Marketing & Sales
- **Alex LeBon Program Manager Snoopy**
  - Lead Engineer, designed Snoopy HALE UAS
  - 10 yrs RC and UAV experience



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# Status

- Snoopy I Prototype successfully flew in Fall/Winter of 2008
  - Fully Autonomous flight completed (T/O & Landing included) - complete
  - Autopilot & Payload used on NightStalker – complete
  - Ground Station – used during Cobra Gold & Balikatan 09
- Snoopy II is built, will fly in Fall 2009

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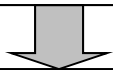
# SNOOPY HALE UAS

STATUS QUO



## Raven B

- Small UAV are typically short duration (<1 - 3 hrs)
- Limited by LOS
- Have hard mounted optics.



NEW INSIGHTS

- Hybrid propulsion = longer flights, more efficient.
- Comm relay permits more mission flexibility and Beyond LOS capability.



**Main Achievement:** Successful Flight of Prototype and Construction of Improved Capabilities System (Hybrid Propulsion & Comm Relay)

**How it Works:** Uses Solar Panels (PV film) on wings, an electric motor and a micro JP-8 powered engine to increase mission duration (goal 15 hrs). Uses miniaturized modems to control (comm relay) other small UAVs.

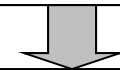
**Assumption and Limitations:** Designed for small UAS relay only. High Altitude is relative to small UAS class...just enough to clear terrain or other obstacles.



QUANTITATIVE IMPACT



- Very Long Range Small UAS (Persistent Recon)
- BLOS Operations
- Turret Optics = more stable & consistent imagery.



- Test fly Snoopy II in fall 2009 NMSU TAAC
- Advanced Flight Testing in Balikpapan 2010

DoD High Priority: Persistent ISR Capability and Mission Flexibility in Small UAS

# Company Profile



- Williams Aerospace, Inc.
- Founded – Dec 2003
- 4 full time & 4 part time employees
- Business areas – Small UAS design, rapid prototyping & limited production, Hybrid Propulsion technologies for UAS

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