Three New Platforms & Supporting Technologies

- Stratospheric ISR
  - Global Observer

- Squad-Level ISR
  - Wasp

- ISR, with teeth
  - Switchblade
AV’s Operating Space

Altitude

Endurance

24/7/365
Affordable Persistence: ISR, Comm Relay

Global Observer

Tactical UAS

X-45 UCAV

Global Hawk

Hunter

Predator

Low-cost, easy to field information gathering for war fighters

Hawk

Wasp

Dragon Eye

Raven

Puma
Value of Affordable Stratospheric Persistence

- Quick Reaction
  - In/out theater Bandwidth
  - Comm Relay
  - ISR
  - Psy Ops
  - Disaster Recovery

- Compelling O&M and LCC Benefits

- Ability to “Reconstitute Capability”
20 years of stratospheric flight experience

Pathfinder-Plus

Centurion

Helios
Underlying Technologies

- LH₂ Tank
- LH₂ Powerplant
- Efficient Electric Generator
- Efficient Propulsion

GO-0 Flights
Energy Densities and Efficiency

- Why Hydrogen?

- Specific Fuel Consumption
**Military ISR and Relay Mission**

- **Low Bandwidth BLOS C² Link**
- **LOS Links for C², comms, data, video & payload tasking (ground teams)**
- **LOS Links for C², comms, data, video & payload tasking (ground command)**

- **Only 2 GO platforms required to enable 24x365 operations**

- **SatCom 9600 Baud**

- **Ground Control**
- **Ground Team #1**
- **Ground Team #2**
- **Ground Commander**
Continuous (24/7/365) persistence over any point in footprint with 2 aircraft
Squad-level ISR:  Wasp
Requirements for Squad ISR

- Small, Lightweight, *System* Rucksack-portable
- Day and Night sensors
- 30+-minute endurance
- Rugged, Reliable
- Low cost
- Low-Observables
Supporting Technologies: Payloads

- **Electric Propulsion**
  - Rugged
  - Quiet
  - Efficient
  - Inexpensive

- **IR Payload**
  - LWIR

- **EO Payload**
  - Digitally stabilized
  - Steerable
Visual/Acoustic Signatures and Resolution

- PTZ Full Zoom
- Integrated EO

Graph showing the relationship between Altitude AGL (ft) and Visual Signature (arc-minutes) for different wingspan conditions:
- Wingspan = 16.5" (Block II)
- Wingspan = 28.5"

Legend:
- Inaudible
- Audible
Wasp Block III Configurations

**Daytime Wasp**
- Front/side imager, digital image stabilization and pan-tilt-zoom
- Integrated dual EO payload
- 45-minute endurance

**Nighttime Wasp**
- Thermal imager
- Integrated dual EO payload
- 40-minute endurance

**Long Endurance Wasp**
- Extended endurance battery pack (double the capacity)
- Integrated dual EO payload
- 100+ minute endurance calculated
Man-portable ISR, with teeth: Switchblade
Squad-level Lethal UAV Requirements

- Man-Portable SYSTEM
  - Air Vehicle
  - Launcher
  - GCU
- Low Optical/Acoustic Signatures
- High Speed
- Autonomous Terminal Guidance
  - Small CEP
- Warhead
  - Lightweight
  - Lethal
  - Minimal Co-lateral
- Low Cost per round
Supporting Technologies

• Lightweight Launcher
  – Simple, reliable launch mechanism
  – Low acoustic signature
• Miniaturized Avionics
  – G-hardened
  – GPS, RF Data Link, IMU, Air Data
• Lightweight Propulsion
  – Quiet efficient motor, propeller, Batteries
• Lightweight Lethal Payload
• Autonomous Terminal Guidance
  – Operator Initiated
  – Low CEP Video Tracker
Small CEP Tracker

QuickTime™ and a Cinepak decompressor are needed to see this picture.
The End