

US Special Operations Command



All Environment Capable Variant (AECV) of Small Unmanned Aircraft System (SUAS)

(b)(6), (b)(3) 10 USC 130b
(b)(6), (b)(3) 10 USC 130b

– PM

PEO, Fixed Wing

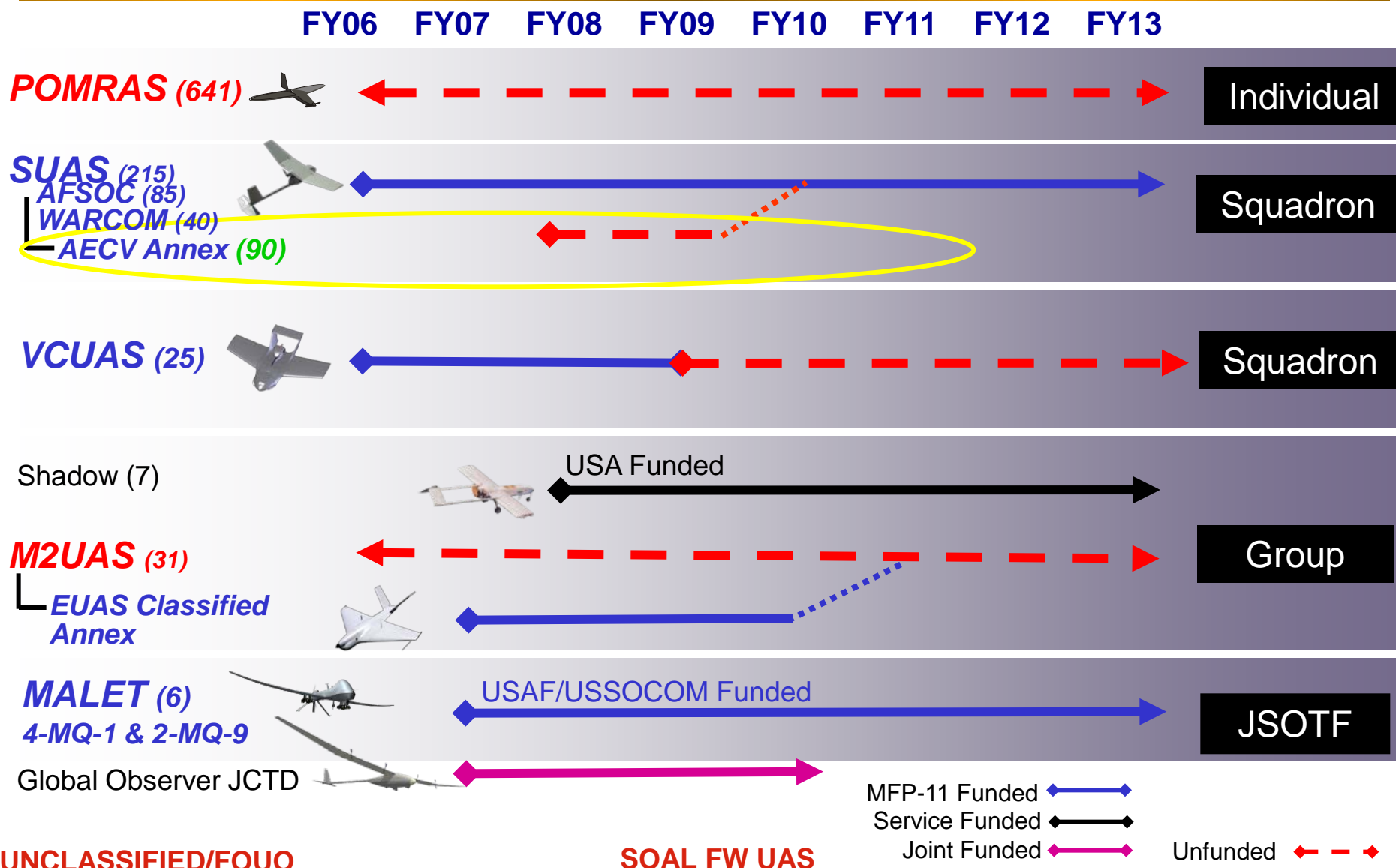
9 July 08

The overall classification of this briefing is:

UNCLASSIFIED



USSOCOM UAS Roadmap





All Environment UAS History

- **RPUAS JORD Approved on 7 Jan 05**
- **SOCOM Validates RPUAS ORD on 2 Sep 05 to Include Non-KPP Threshold Requirement for “Landing Into a Standing Body of Water...”**
 - **Army Does Not Agree to Amendment**
- **Army Competitively Awards RPUAS Material Solution Raven B Contract Oct 06**
 - **Doesn't Meet SOCOM Splash, Dust, and Dirt Proof Requirements**
- **AECV Annex with BOIP Increase Approved on 25 Jan 08**
- **USSOCOM RFP for AECV released 29 Feb 08**
- **AECV Contract Awarded 30 Jun 08**



AECV Customer Requirements

- **Customer: NSWC**

- **Why AECV Needed:**

- Captures Technology Advances and Additional Operational Requirements Since RPUAS JORD
- Significantly Enhances the Survivability and Consequently the Utility of the Current SUAS Materiel Solution
- Expands the Operational Envelope to Include Environments of High Moisture/Rain, High Humidity, Snow, and Fresh/Salt Water to the Extent That the Equipment Will Withstand Repeated Landings in Both Fresh and Salt Water
- Provides SOF Tactical Units a Highly Mobile UAS Capable of Being Deployed from Both Land and Maritime Mobility Platforms
- Supplies a Low Altitude ISR Capability and Vital Situational Awareness Where No Capability Currently Exists



AECV Key Performance Parameters

- **Environmental Conditions- Survivability**
 - Land in Water/Remain Afloat Four (4) Hours at Sea State Three
 - Operate in Dirt, Dust, Mud, and Snow Conditions With Up to 100% Humidity for Up to Four (4) Hours
 - Maintain Station in Winds Up to 25 Knots
- **Launch And Recovery**
 - Launch From All NSW Maritime Craft
 - Repeated Landings in Water, Dirt, Snow, Mud, Sand And Swamps
 - Land Within 25m of Designated Point in Winds Up to 20 Knots and 80% Confidence Within 50m in Winds Greater Than 20 Knots
- **Endurance**
 - Two (2) Hours Above Freezing and One (1) Hour Below 20° F
 - Ground Equipment Capable of External Power Sources
- **Maximum Time Between Launches: 15 Minutes**
- **Weight/Size: Two Max Endurance Missions Will Fit in Two (2) Waterproof Cases (53"x16"x6") ≤50 Lbs Total**

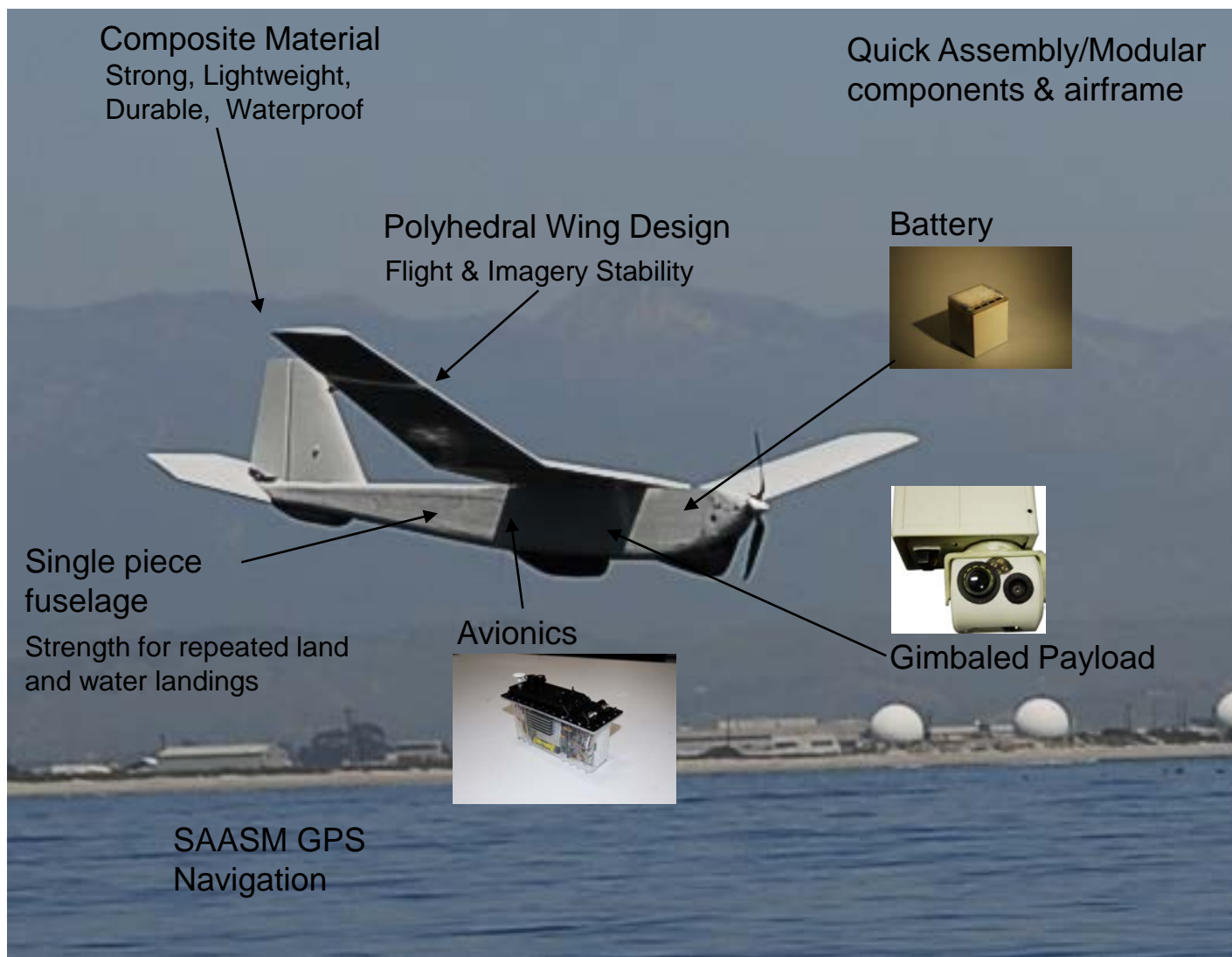


AECV Key System Attributes

- **EO/IR Payload Aiming**
 - Gimbaled 360° Pan, 90° Tilt EO/IR imagery
- **Training Equipment/Simulator**
 - Embedded Training Capability
- **Sensor Lock and Tracking**
 - Automatic EO/IR Camera Tracking of Fixed and Moving Targets
- **Electronic Auto Log/Tracking**
 - Electronic Pilot Log Book
 - Tamper Proof
- **Metadata Overlay**
 - Ability to Configure Telemetry Fields Included in Image Overlay
- **Interoperability/Equipment Commonality with Existing SUAS**



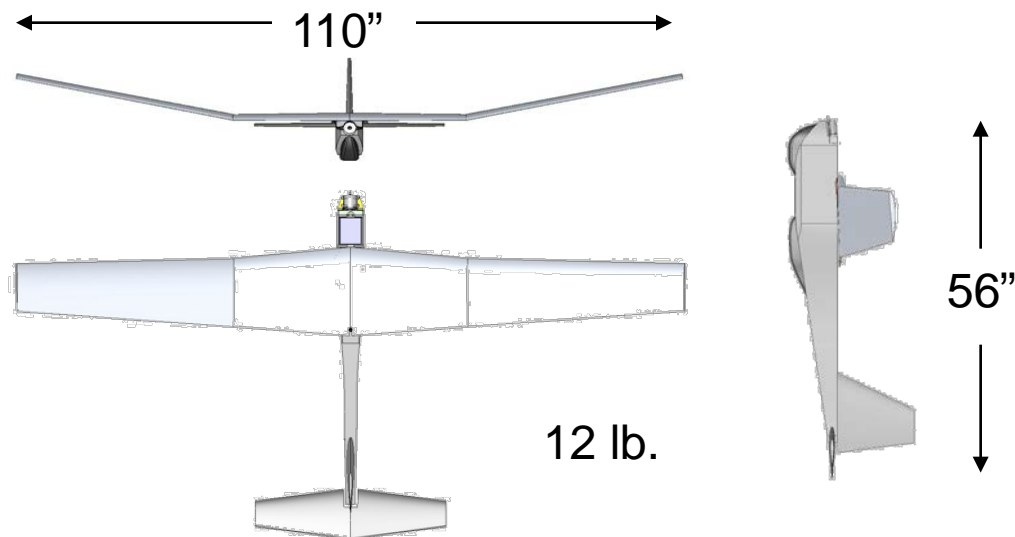
Material Solution: AeroVironment Puma-AE





Aircraft Specification

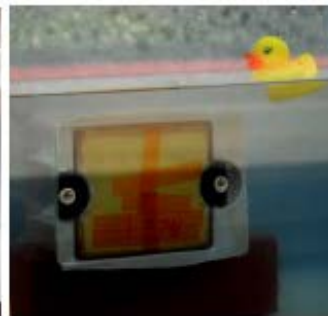
Launch Method	Hand
Landing Method	Deep Stall
Wingspan	110"
Weight	12 lb.
Airspeed Range	20-52 knots
Operational temp.	-20 to 120° F
Nominal Endurance	135 minutes
Modular Battery Capacity	3.8 lb.
Modular Payload Capacity	1.2 lb.
Range	10-20 Km (LOS)
Navigation	SAASM GPS
Flight Control Modes	Manual, Automatic Navigation, Follow-Me, Loiter, Altitude Hold, Home
Motor	Direct Drive Electric
Strobe	Visible/Infrared





Environmental Testing

Individually Waterproofed LRUs Component Level Testing in Salt Water



Fresh Water Rinse

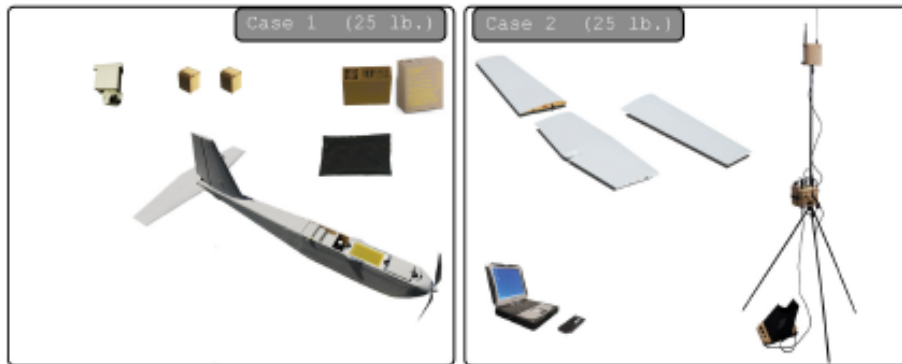


Salt Water Landing





Basic Load Out





System Setup





Launch

Launch capable in 0 mph headwinds





Recovery

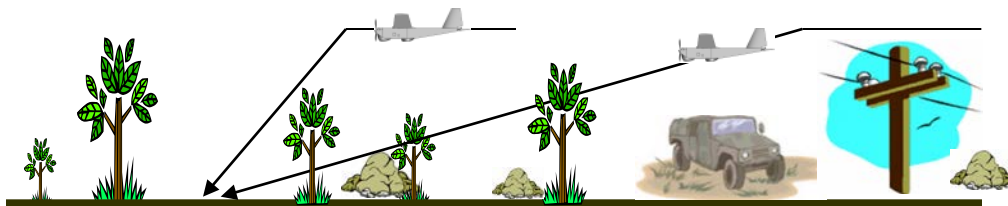
Demonstrated Accurate Autonomous Landing Capability



Demonstrated Ability to Land in Water, Float for Extended Period, and Re-launch without Damage



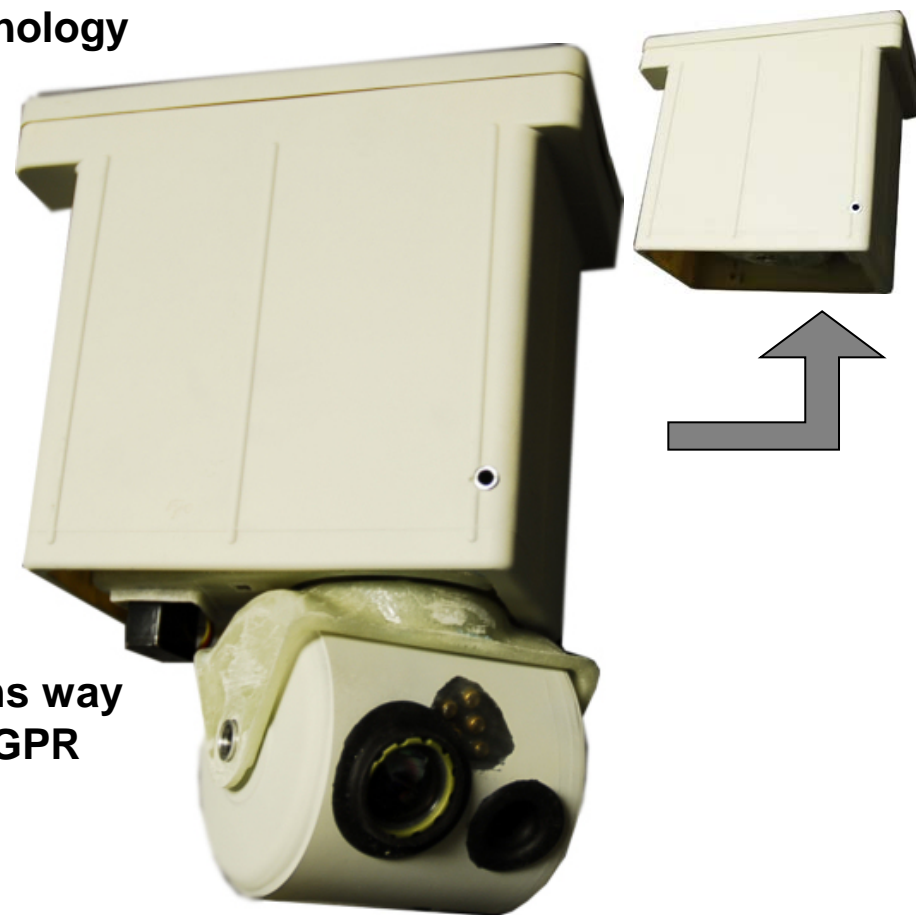
Steep Insertion Angle for more precise landing and avoidance of obstacles





Modular EO/IR Payload

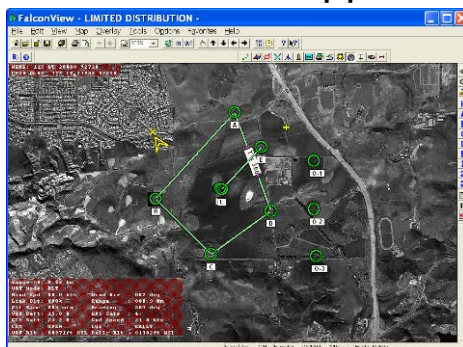
- Based on proven Wasp and Raven-B Technology
- Combined EO, IR, and Laser Pointer
- Range of Motion
 - +/- 185° AZ, 90° EL
- Environmental Sealing
 - Fully functional immersed in salt water
- Minimized Moving Parts
 - No Autofocus or Auto Iris
 - 4x "Solid State" Zoom
 - Simple Low Frequency Stabilization
 - Digital Stabilization
- Protected when stowed
 - Landing Pad Protects Payload
 - Retracts and lens rotates up out of harms way
- Modular Payload ICD to be provide under GPR



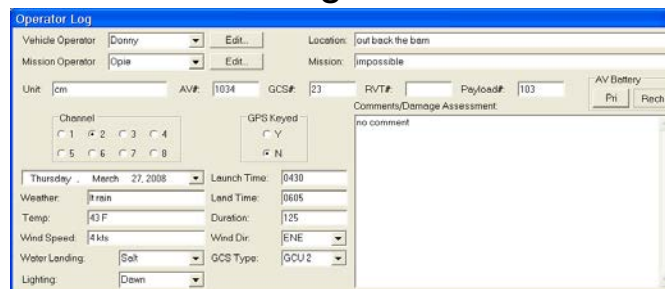


GCS Commonality

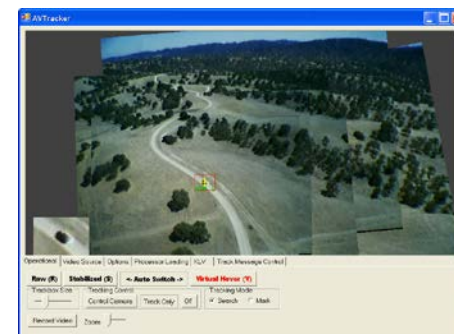
FalconView 4.1 Tool
with PFPS Support



Electronic
Logbook



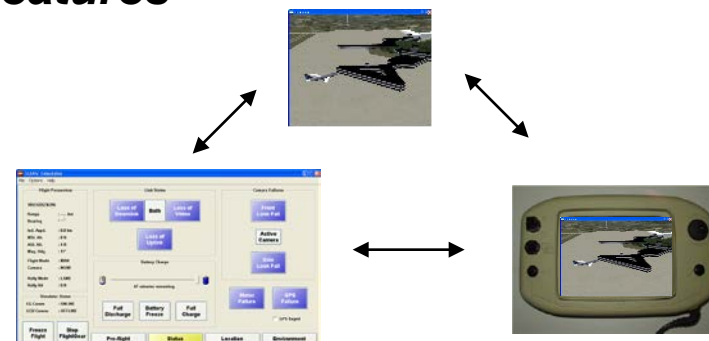
Video Tracker and
DVR



New AECV Features Raven B Features



CoT Support

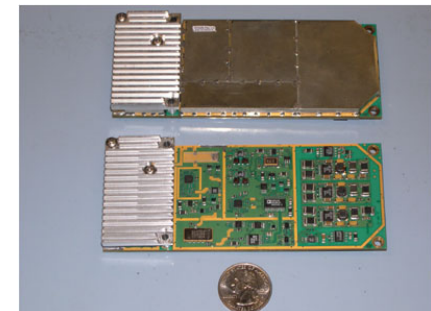


AV Simulator



Spiral Upgrades

- **Digital Data Link**
- **Extended Endurance**
 - 6+ Hours using Fuel Cell Technology
- **Acoustic Signature Reduction**
 - Vibration Isolation
 - Alternate Propeller
- **Enhanced EO/IR Payload**
 - 9MP EO Imager
 - 640 x 480 IR Imager
 - On-board Stabilization and Tracking







AECV SUAS PREVIEW



Unclassified // For Official Use Only

US Special Operations Command



QUESTIONS?

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UNCLASSIFIED