

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

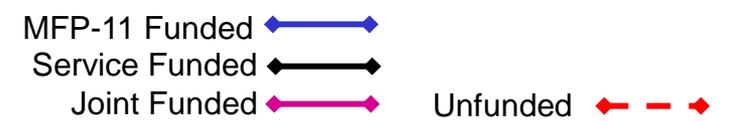
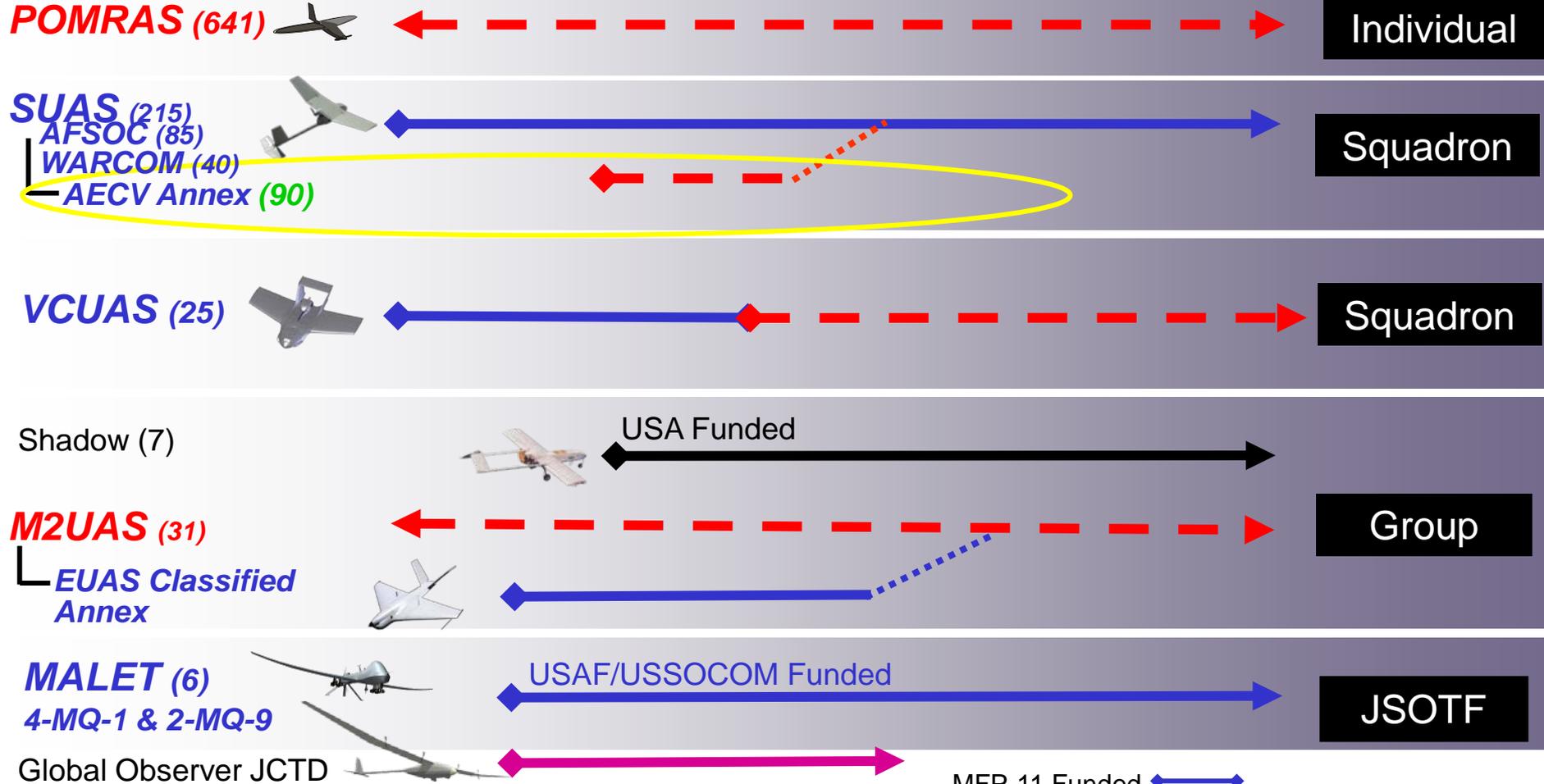
The overall classification of this briefing is:

UNCLASSIFIED



USSOCOM UAS Roadmap

FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13





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**

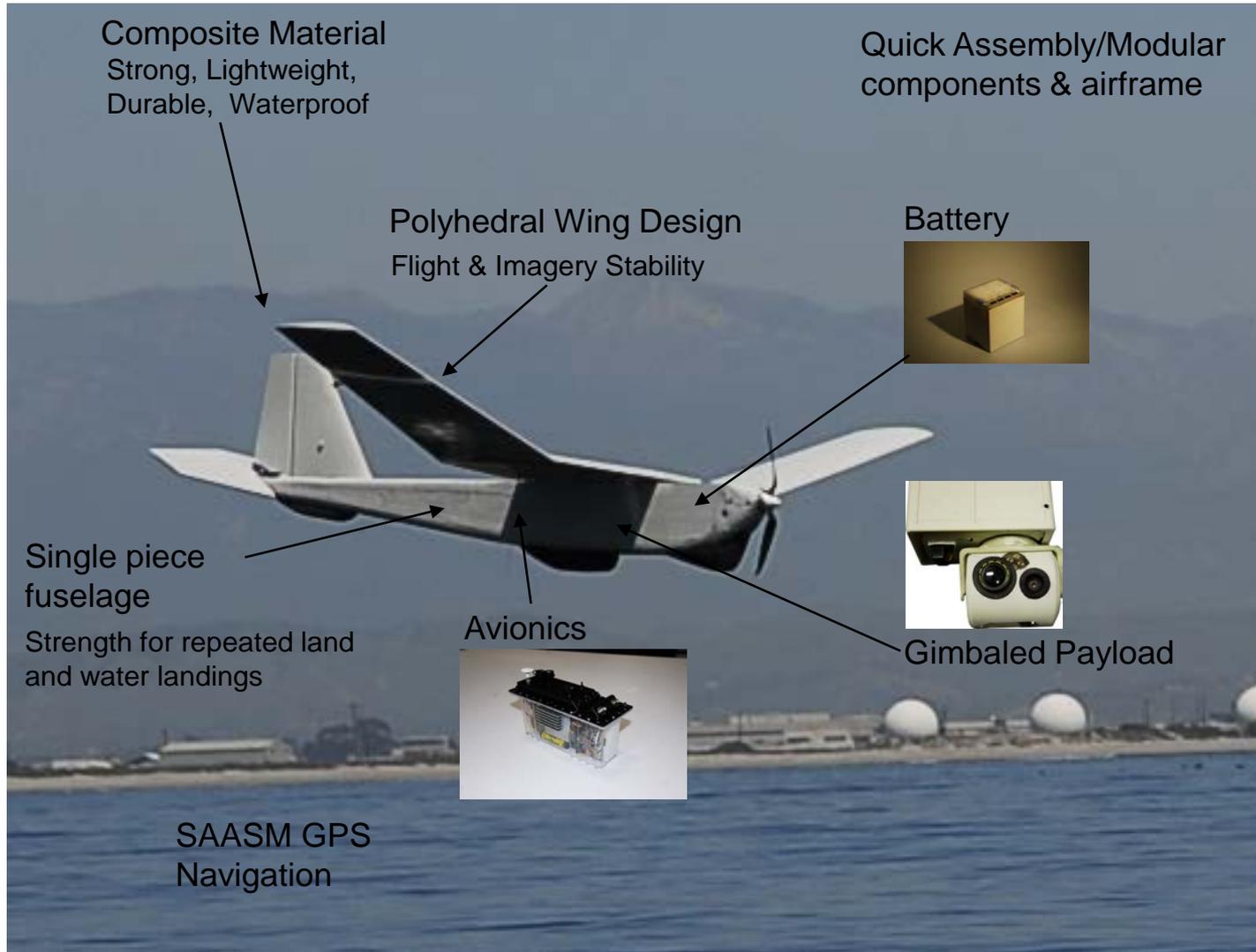


AECV Key System Attributes

- **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**



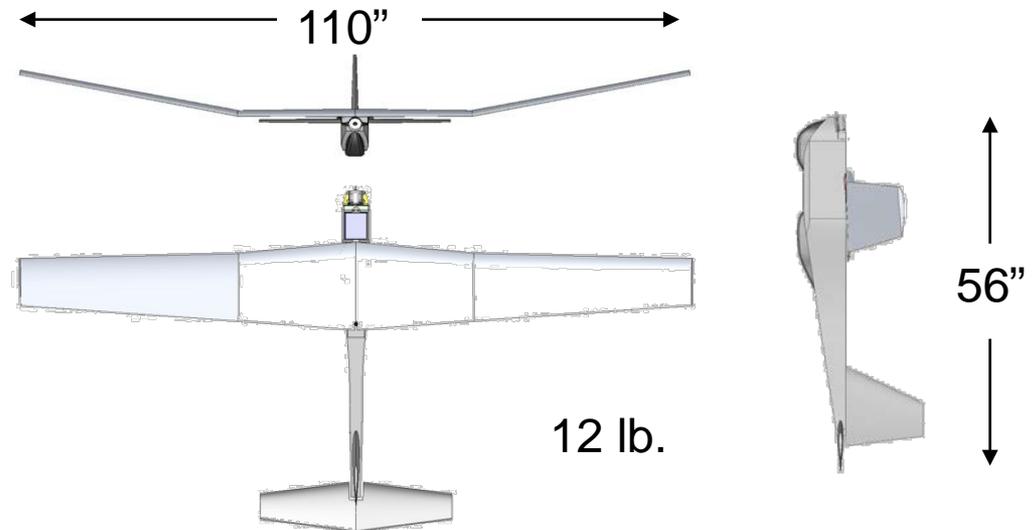
Material Solution: AeroVironment Puma-AE





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

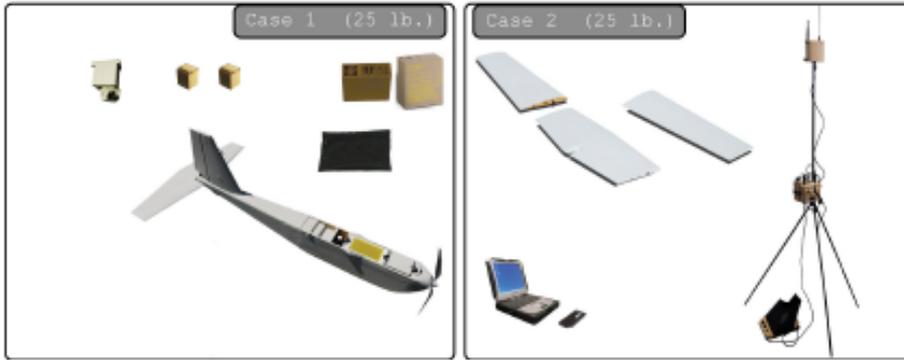


Salt Water Landing





Basic Load Out





System Setup





Launch

Launch capable in 0 mph headwinds





Recovery

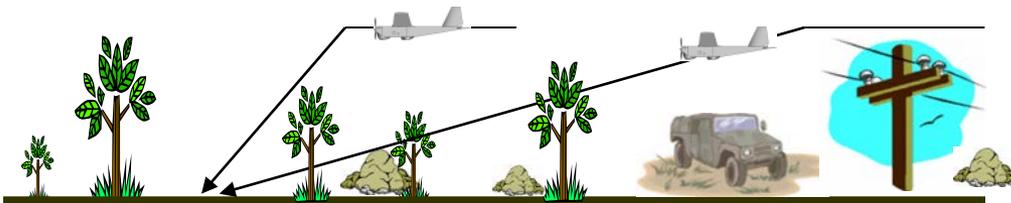
Demonstrated Accurate Autonomous Landing Capability



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



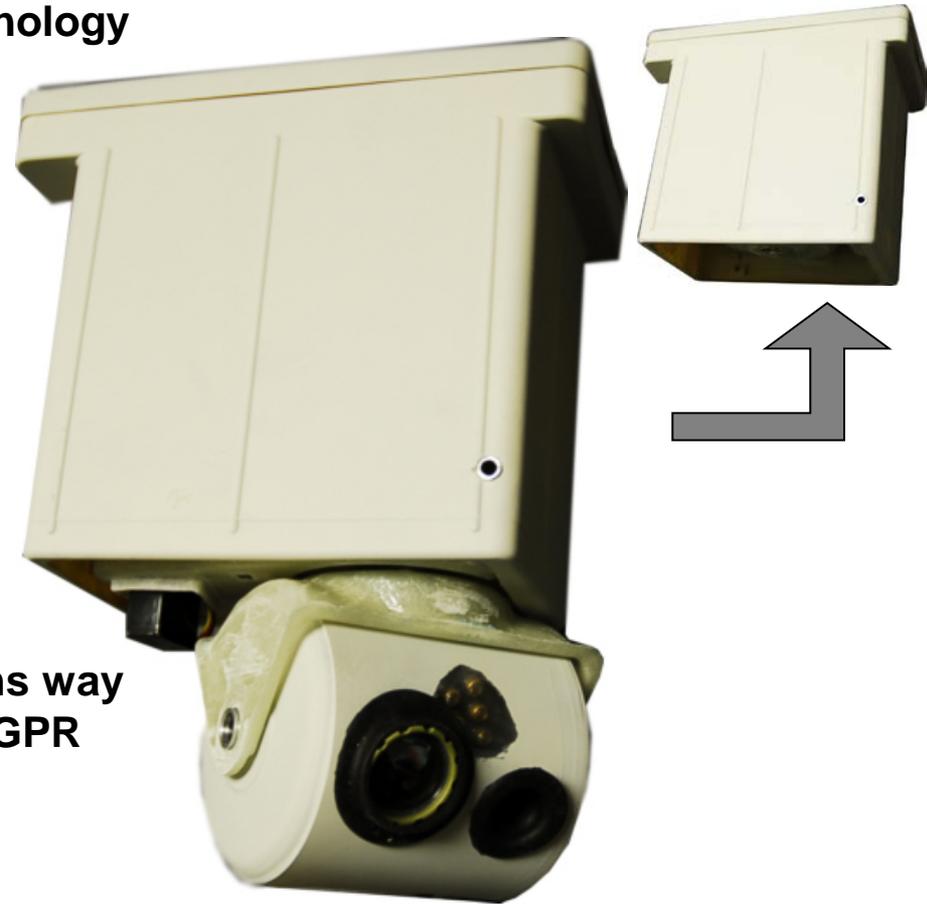
Steep Insertion Angle for more precise landing and avoidance of obstacles





Modular EO/IR Payload

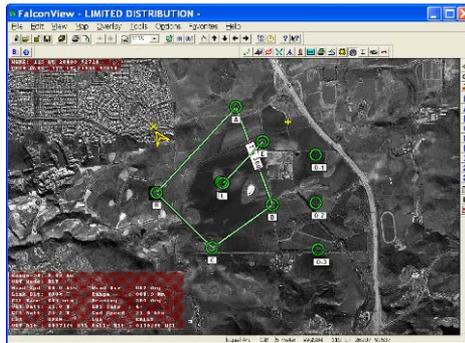
- Based on proven Wasp and Raven-B Technology
- Combined EO, IR, and Laser Pointer
- Range of Motion
 - +/- 185° AZ, 90° EL
- Environmental Sealing
 - Fully functional immersed in salt water
- Minimized Moving Parts
 - No Autofocus or Auto Iris
 - 4x "Solid State" Zoom
 - Simple Low Frequency Stabilization
 - 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

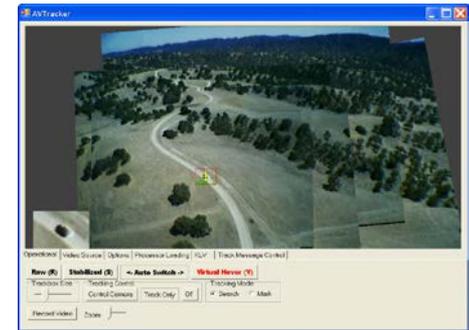
FalconView 4.1 Tool with PFPS Support



Electronic Logbook



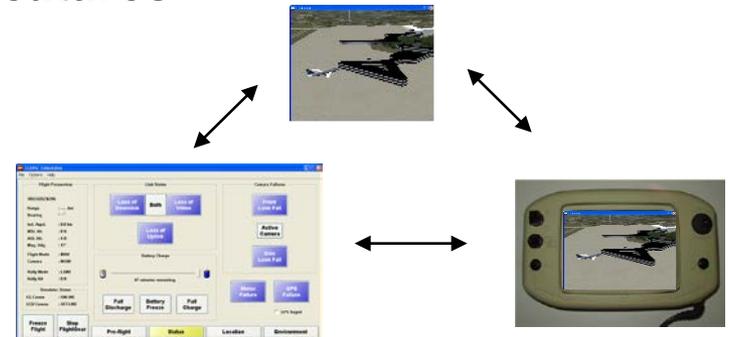
Video Tracker and DVR



New AECV Features Raven B Features



CoT Support

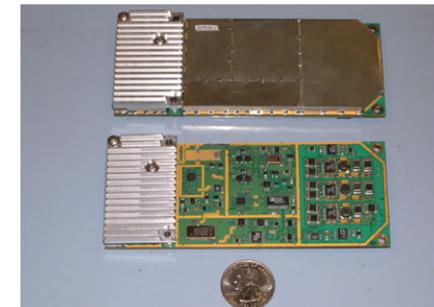


AV Simulator



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 SCHEDULE

1st QTR FY08		2nd QTR FY08			3rd QTR FY08			4th QTR FY08			1st QTR FY09			2nd QTR FY09				
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	
OCT	AECV RFI Release	AECV RFI Responses Received	AECV BOI Appd AECV Synopsis Posted	AECV Acq. Strategy Briefing AECV RFP Release		Written Responses Oral Proposals	Fly Off's	SSA Competitive Range Decision Briefing	Discussions	Contract Award	Kick off Meeting							
														Initial Systems Complete	NET Complete	User Eval		OT Report



AECV SUAS PREVIEW



Unclassified // For Official Use Only

US Special Operations Command



QUESTIONS?

The overall classification of this briefing is:

UNCLASSIFIED