Unmanned Aircraft Systems (UAS)

USMC NDIA EWC Conference

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Product Director,
Common Systems Integration
Topics

• Army UAS Operations
• Interoperability, Commonality, Standardization
• Path Ahead
Beer for Horses
Organization and Vision

Vision
Become the Department of Defense “Materiel” Center of Excellence for all Unmanned Systems

Mission
Provide the Department of Defense with World Class Unmanned Systems that are interoperable with joint and coalition partners, common with other Army systems and affordable through excellence in program management
Supporting the Warfighter
Current Situation

14 Systems & 56 Air Platforms
2 Systems: 3 I-Gnat & 1 Warrior A
Air Platforms
2 System
- 1 System & 5 Air Platforms (MQ-5B)
- 1 System & 4 Air Platforms (RQ-5B)

1 System & 4 Air Platforms
20 Systems:
- 3 I-Gnat & 1 Warrior A
Air Platforms

256 Systems & 768 Air Platforms

Field Support Representatives in Country
Total Hours Flown: 215,391
OIF/OEF Hours Flown: 162,071
75% Combat Hours Flown

"This technology is changing the way we fight and we will not go without."
Task Force Commander in Theater

<table>
<thead>
<tr>
<th>UAV</th>
<th>Sorties</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAVEN</td>
<td>889</td>
<td>12,900</td>
</tr>
<tr>
<td>SHADOW</td>
<td>10,982</td>
<td>44,771</td>
</tr>
<tr>
<td>HUNTER</td>
<td>33,830</td>
<td>128,952</td>
</tr>
<tr>
<td>IGNAT</td>
<td>30,119</td>
<td>28,768</td>
</tr>
</tbody>
</table>

FY05
81% of UAV Hours Flown on 11% of DoD Unmanned A/C Budget

FY06
90% + of UAV Hours Flown on 15% of DoD Unmanned A/C Budget
One System Ground Control and Remote Video Transceiver

1996 - 2005

- Logistical requirements
  (Manuals, Software Maintenance, PLL)
- Multiple Training requirements
- Limited Situational Awareness

2006 - 2007

- Common Cockpit Philosophy leads to:
  - Reduced logistical requirements
  - Common Training/Standardization
  - Open ended architecture (accepts FCS)
  - Maximizes situational awareness technology

2008 – 2010

- Increased Operational Effectiveness
- Cost Avoidance

SA at Brigade

Hunter

Weight: 350 lbs
Range: 40 Km

SA at Platoon

IGNAT

Hunter

Army FCS

Weight: 65 lbs
Range: 125 Km

Commonality

Increased Operational Effectiveness

Cost Avoidance

Remote Video

One System GCS

Ground Station

7 Configurations

Remote Video Transceiver

One System RV Terminal

Shadow

IGNAT

Hunter

Hunter

Shadow

One System RV Terminal

Weight: 350 lbs
Range: 40 Km

Weight: 65 lbs
Range: 125 Km
One System Remote Video Terminal

DESCRIPTION
OSRVT is a kit that is integrated onto the ROVER III System that provides enhanced situational awareness with near Real Time Video and Telemetry Data from multiple manned and unmanned platforms: Hunter, Shadow, Predator, Pioneer, IGNAT, other UAS and manned Litening Pod platforms.

The OSRVT kit consists of UHF Modem, cables, software and an optional extended range antenna. Software supports decoding Telemetry and META Data from multiple UAS, links data onto FalconView maps, and supports Off Target Calculations.

CAPABILITIES
• Auto Detection
• Telemeter Data Linked to FalconView With 2525 Symbology
• JPEG Files With Embedded Metadata
• Off Target Calculations
• “John Madden” Functionality
• Tri-Band (C/L/Ku) Extended Range Antenna, up to 80km (Optional)
• S-Band Planned for 2 QTR FY 07

E-ROVER III
• $35K, 2-6 Month Lead Time
• 6 Month Warranty

OSRVT
• $20K, 2 Week Integration Time
• $45K for Extended Range Antenna (Optional)

SYSTEM DELIVERIES
• 20 systems in Nov, 10 systems in Dec – TF Odin
• 20+ Systems, 1st QTR FY 07 – Various Units
• 14 Systems, 1st QTR FY07 – 82nd Airborne
• 45 Systems, 2nd QTR FY07 – TUAV (Shadow)

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CSI Vision, Mission, Goals

**Vision:** Become the US Government & Worldwide leader in Excellence for Joint Interoperability and Commonality of All Unmanned Aircraft Systems.

**Mission:** Develop Common Solutions to Support Unmanned Systems through Horizontal Integration, which Reduce Life-cycle Costs and Increase System Interoperability through the Joint Battlespace.

**Goals:**
- To provide the necessary guidance to UAS Product Managers and their Prime Contractors to Improve Deficiencies and Achieve Interoperability & Commonality Compliance…by Providing Documented Requirements & Performance Specifications
- Develop Horizontal Integration of Interoperability & Commonality Across Army UAS
- Develop Interoperability with Manned Aviation Platforms
- Provide Situational Awareness Domination to the Army & Joint Forces through Standard Dissemination Develop Common Airspace Integration Solutions
- Horizontal Integration of Technology Across Army UAS
- Bridge the Gap Between Current Modular Force and Future Force
- Develop Common & Cost Effective Supportability & Logistics
How We Are Structured To Meet Goals

PD CSI

Deputy PD CSI

Certification Center

Management Support

Overarching
Interoperability & Commonality IPT

Common Product Dissemination IPT

Common Situational Awareness IPT

Common Control Systems IPT

Common Data Communications IPT

Common Logistics & Trainer IPT

Advanced Concepts IPT

Advanced Architecture IPT

S&T IPT

IRAD Coordination IPT

Working Current Issues (0 - 3 Years)

Shaping The Future (3+ Years)
Common Systems Integration Methodology

Joint Programs

External Army Programs

Internal UAS Programs

Advanced Concepts

Advanced Architecture

S&T

Other “Guidance”

DA “Guidance”

Architecture Vision

UAS Interoperability Capabilities Road Map (Defined Capabilities)

UAS PMO Integrated Master Schedule

Do Not Yet Exist!

CSI I&C Profiles

JCIDS

Other “Guidance”

Integrated Master Schedule

Functional Area Joint Concepts

Integrated Architectures

Functional SFA Analysis

UAS Interoperability

Capabilities Road Map

(Defined Capabilities)

Advanced Concepts

Advanced Architecture

S&T

Do Not Yet Exist!
Army UAS Version 1.0
Interoperability Profiles

• Version 1.0 Interoperability Profiles
  – Draft Released Comments (05 May 2006)
  – Final Release (14 August 2006)
• Overarching Guidance
  – Compliance of Standards No Later than 4QFY08 or the Systems’ IOT&E
  – Product Managers are Encouraged to Assess the Cost and Schedule Impacts of all CSI Guidance
  – If Cost and Schedule Impacts are too Onerous, Apply to Product Manager CSI for a Waiver
  – Burdens of Implementation are upon the Products, Compliance with CSI Guidance is to become a Required Aspect of the Assembly of a PM UAS Program Management Acquisition Strategy
  – Compliance of standards is not Required for PM UAS’ FCS Systems
• Core “Common” Document - Does/Does Not
  – Does Provide Interoperability Requirements across Platforms
  – Does Not Dictate Design Solution
  – Does Allow for Design Space
• Annexes – Platform’s Exception to Common Core Document
### Joint Interoperability Path Ahead

<table>
<thead>
<tr>
<th>Event</th>
<th>2006</th>
<th>2007</th>
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<tr>
<td>Aviation Interoperability Summit (19 Sep)</td>
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<td>Army, Navy, USMC Working Meetings (25-26 Sep)</td>
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<td>NAVAIR T-CDL Special Interest Group (27 Sep)</td>
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<tr>
<td>Brief JMRB (05 Oct)</td>
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<tr>
<td>Develop Draft Joint Interoperability Profile Document (27 Oct)</td>
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<tr>
<td>Coordinate with US Air Force (Nov)</td>
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<tr>
<td>Joint WG Meeting - Final Document (Wk of 5th)</td>
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<tr>
<td>Present to CDL Executive Agent (wk of 12th) “DoD Interoperability Standard”</td>
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<td>▲</td>
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<tr>
<td>Work Through OSD Chains To AT&amp;L For Signature Of DoD Interoperability Mandate</td>
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*Note: The table uses symbols to indicate the timeline of events.*
TCDL Interoperability Profile

- Purpose: Define the Common and System Specific Operating Parameters/Profiles, as Specified in the Waveform Specification for the Standard Common Data Link (Std-CDL) Specification Number 7681990, for Tactical Common Data Link (TCDL) waveforms used by US Army Unmanned Aircraft Systems (UASs) and Associated Ground Control Stations (GCSs).
## FY 07 Integrated Product Teams Migration

### Overarching Interoperability & Commonality IPT

<table>
<thead>
<tr>
<th>OSRVT</th>
<th>Blue Force Tracker</th>
<th>OSGCS</th>
<th>TCDL</th>
<th>Common Trainer</th>
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<tr>
<td>Common Product Dissemination IPT</td>
<td>Common Situational Awareness IPT</td>
<td>Common Control Systems IPT</td>
<td>Common Data Communications IPT</td>
<td>Common Logistics &amp; Trainer IPT</td>
</tr>
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#### OSRVT
1. One Systems Remote Video Terminal (OSRVT)
2. KLV/Meta Data
3. C4I
4. Video Storage & Dissemination (PICTE Like)
5. SmartCam
6. MPEG-2/H.264 Compression
7. Encryption

#### Blue Force Tracker
1. Blue Force Tracker (BFT) / FBCB2
2. Link -16
3. Airspace Integration/ TAIS
4. Sense & Avoid / Collision Avoidance

#### OSGCS
1. STANAG/ Vehicle Specific Module (VSM)
2. Core UAV Control System (CUCS)
3. Payloads / Weapons C2
4. Mission Planning / PFPS
5. Vehicle Control Software (VCS)
6. Air Worthiness (Ground Implementation)
7. Common Takeoff & Landing System
8. GATM/CNS/ATM

#### TCDL
1. TCDL/Digital Data Links
2. WiFi/WiMax
3. Networks

#### Common Trainer
1. IMS (Trainers)
2. MUSE
3. IETM
5. Readiness Reporting
What you See.............

Is the tip of the Iceberg......
Conclusion

Support The Warfighter

• 970 Army unmanned aircraft vehicles deployed

• Highest OR Rate and OPTEMPO in Theater

• Establish Interoperability Standards

• Improve horizontal integration across manned and unmanned systems

Last to Leave Theater