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

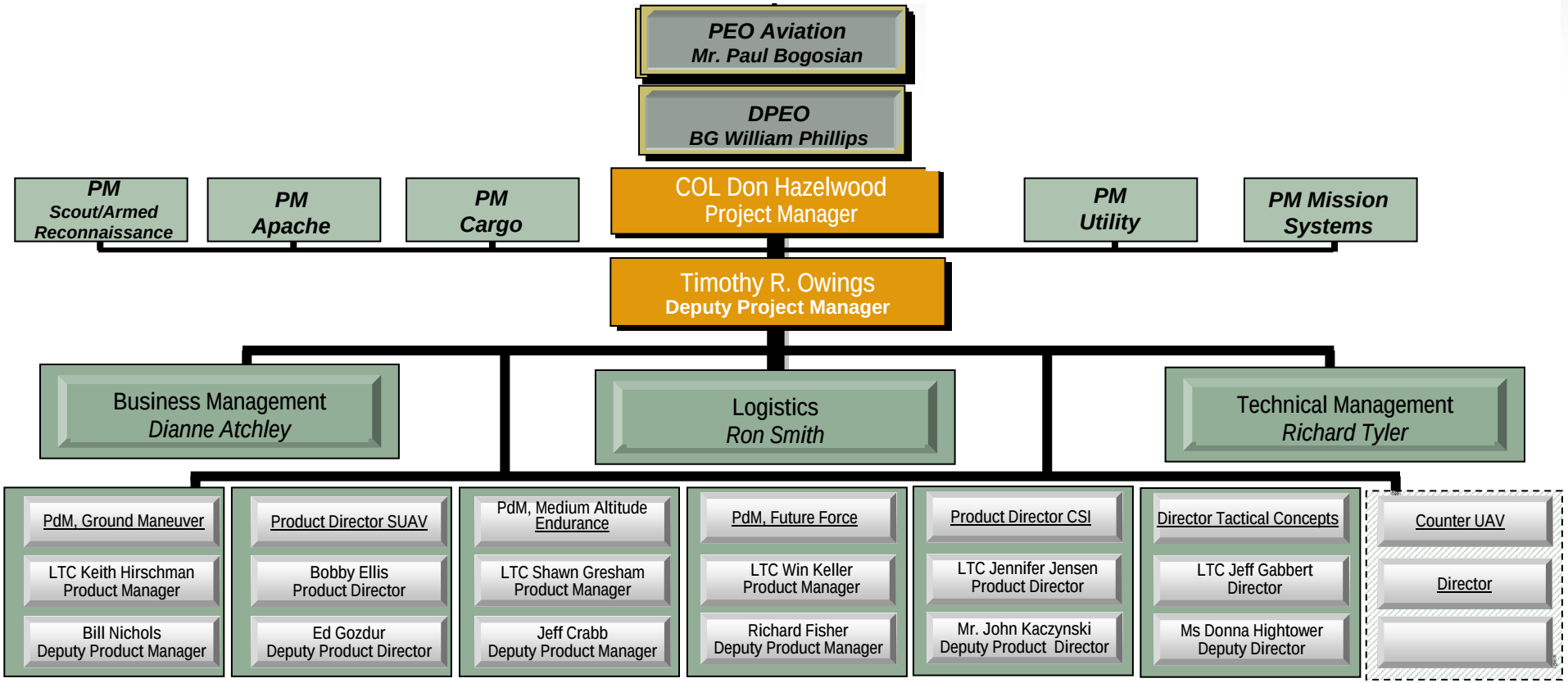
Organization and Vision

Vision

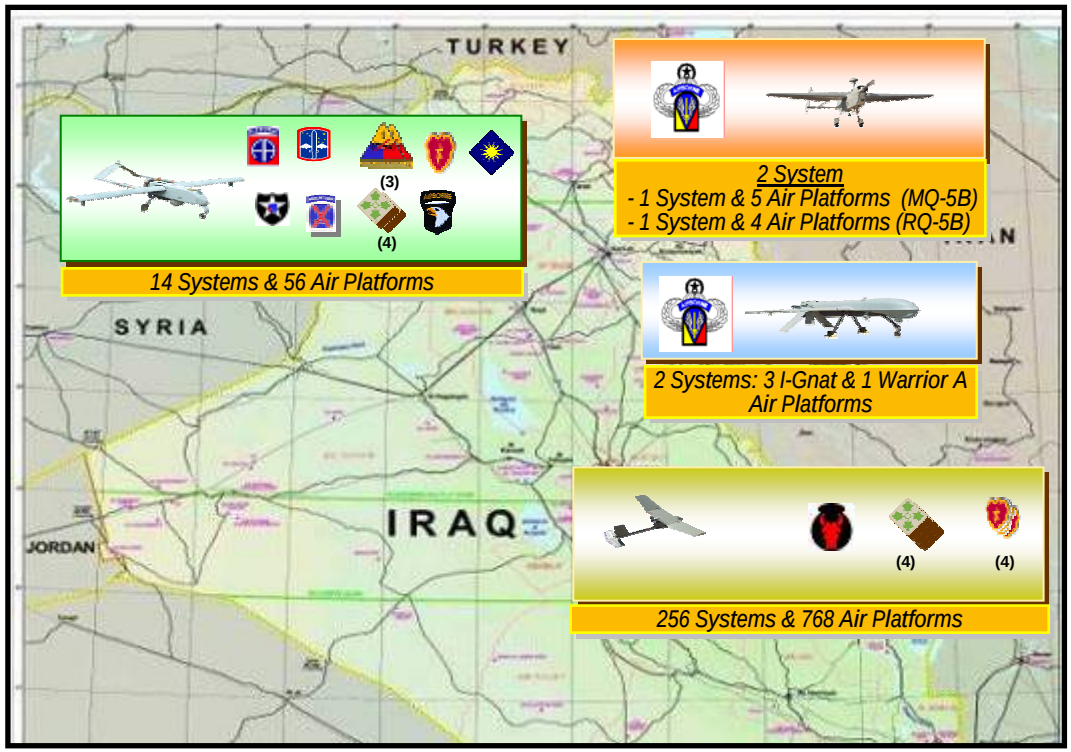
Become the Department of Defense "Materiel" Center of Excellence for all Unmanned Systems

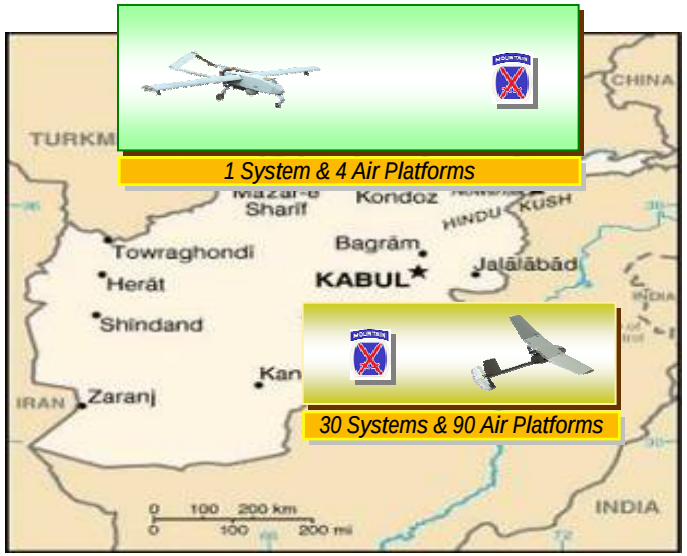
Mission

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





Field Support Representatives in Country

Total Hours Flown : 215,391

OIF/OEF Hours Flown: 162,071

75% Combat Hours Flown

UAV	Sorties Hours
IGNAT	889 12,900
HUNTER	10,982 44,771
SHADOW	33,830 128,952
RAVEN	30,119 28,768

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

"This technology is changing the way we fight and we will not go without."

Task Force Commander in Theater

UAS Capability Over Time

HUNTER
RAVEN
SHADOW
ERMP
FCS CLASS UAVS

9-11

FY 06

Hunter

3 Units
(~ 3 Systems)
(~19 Air Platforms)

FY 08

Hunter
Shadow
Shadow
Shadow
Raven

77 Units
(~ 610 Systems)
(~ 1,869 Air Platforms)

System Improvements

FY 11

ERMP
Hunter
Shadow
Shadow
Shadow
Shadow
Shadow
Raven

ERMP
Hunter
Shadow
IGNAT
Raven

122 Units
(~ 1,373 Systems)
(~ 4,190 Air Platforms)

System Improvements

Future Force Spirals

230 Units
(~2,331 Systems)
(~7,085 Air Platforms)

Increasing UAVS Capability Across Echelons

One System Ground Control and Remote Video Transceiver

1996 - 2005

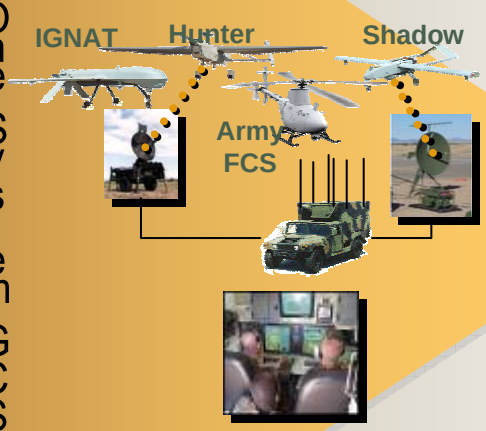
Ground Station

7 Configurations

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

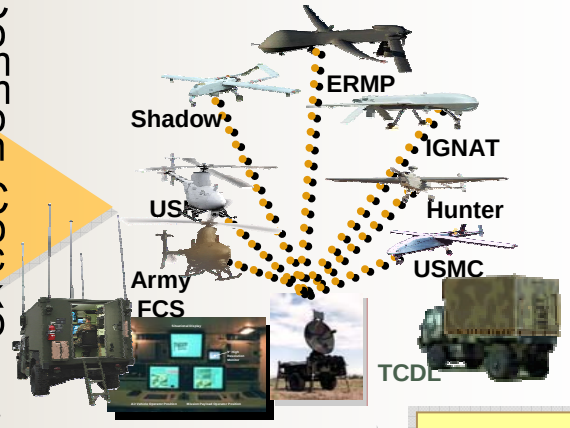
2006-7
Block I

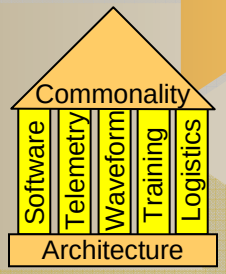
One System GCS



2008 – 2010
Block II

Common Cockpit





Commonality

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

Increased Operational Effectiveness

Cost Avoidance

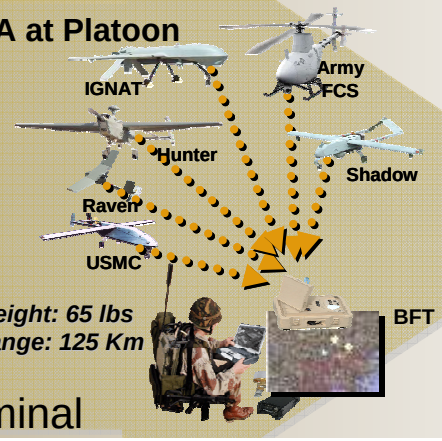
Remote Video Terminal

SA at Brigade

Weight: 350 lbs
Range: 40 Km

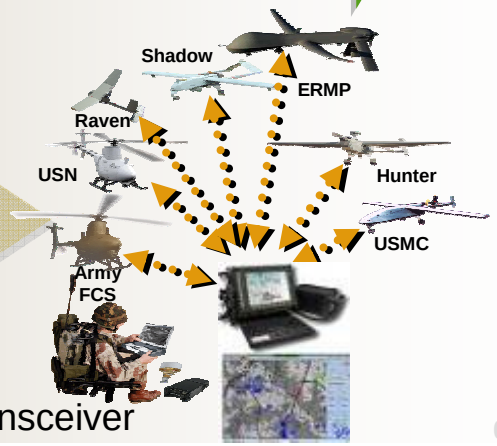
One System RV Terminal

SA at Platoon



Weight: 65 lbs
Range: 125 Km

One System RV Transceiver



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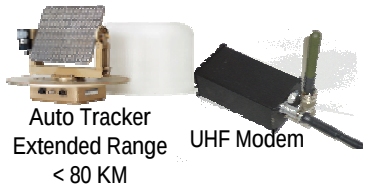
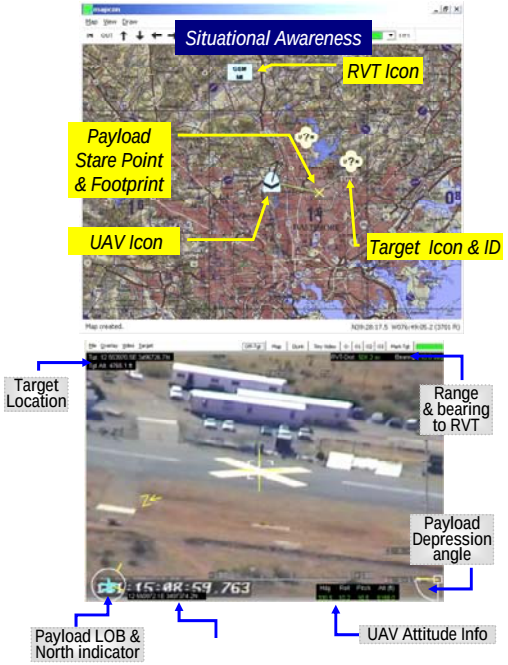
One System Remote Video Terminal





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)

CONTACT INFORMATION

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CSI Vision, Mission, Goals

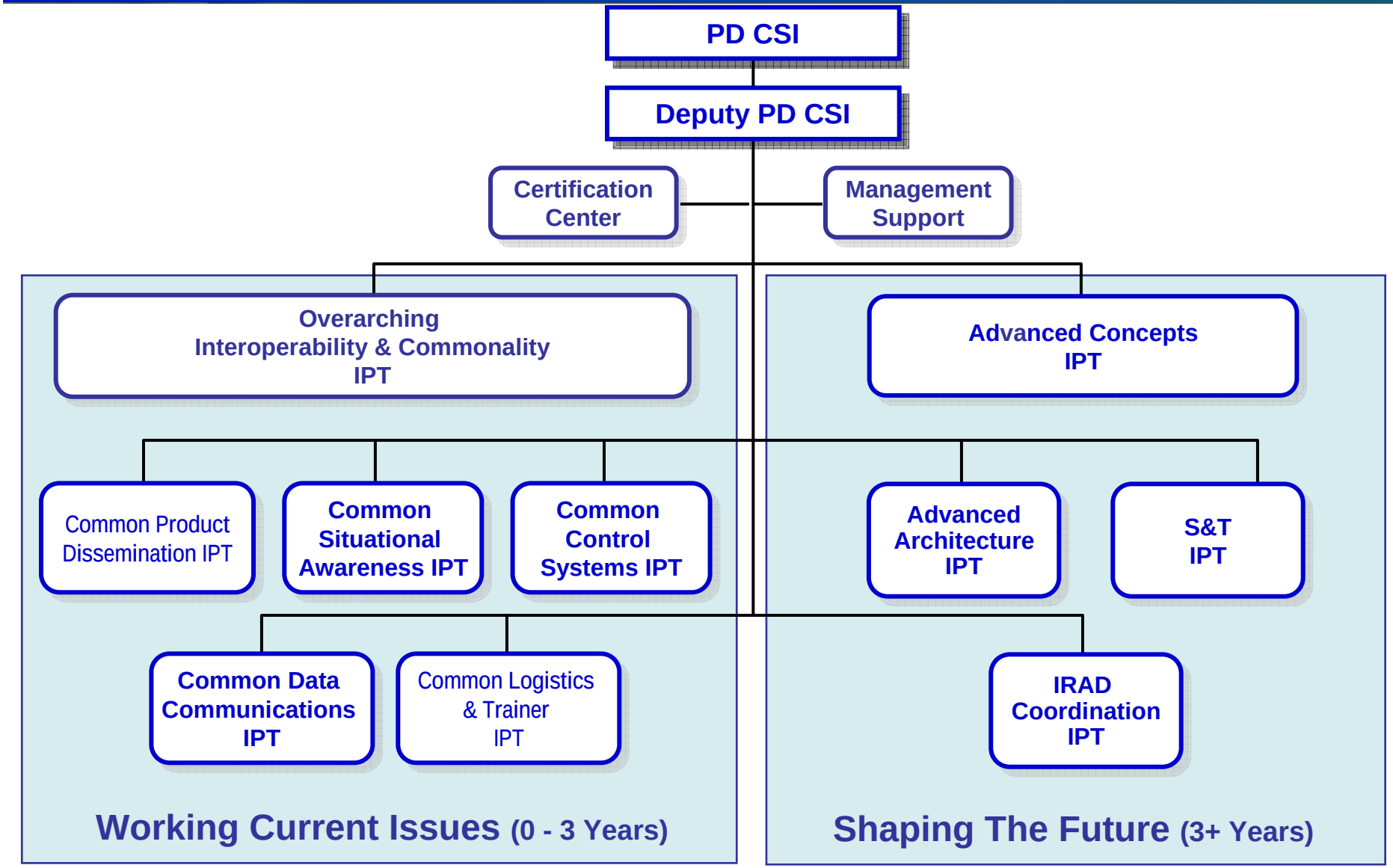
Vision: Become the US Government & Worldwide leader in Excellence for Joint Interoperability and Commonality of All Unmanned Aircraft Systems.

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

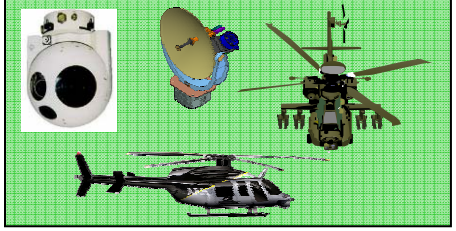
How We Are Structured To Meet Goals



Common Systems Integration Methodology

Joint Programs

External Army Programs

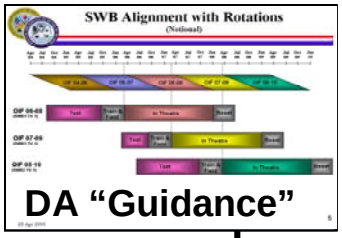


Internal UAS Programs

Advanced Concepts

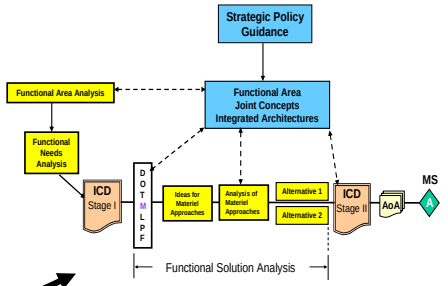
Advanced Architecture

S&T

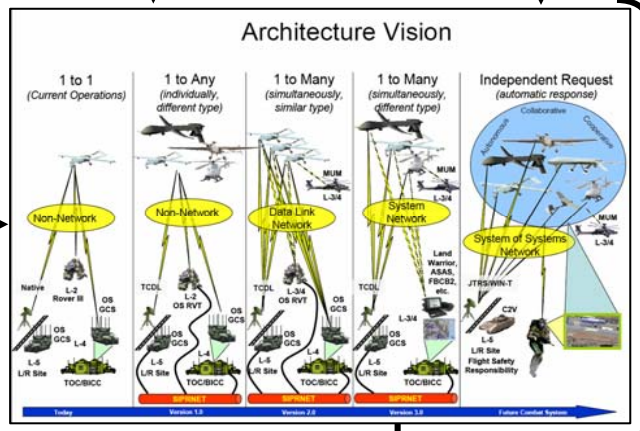


DA "Guidance"

Other "Guidance"



JCIDS



CSI I&C Profiles

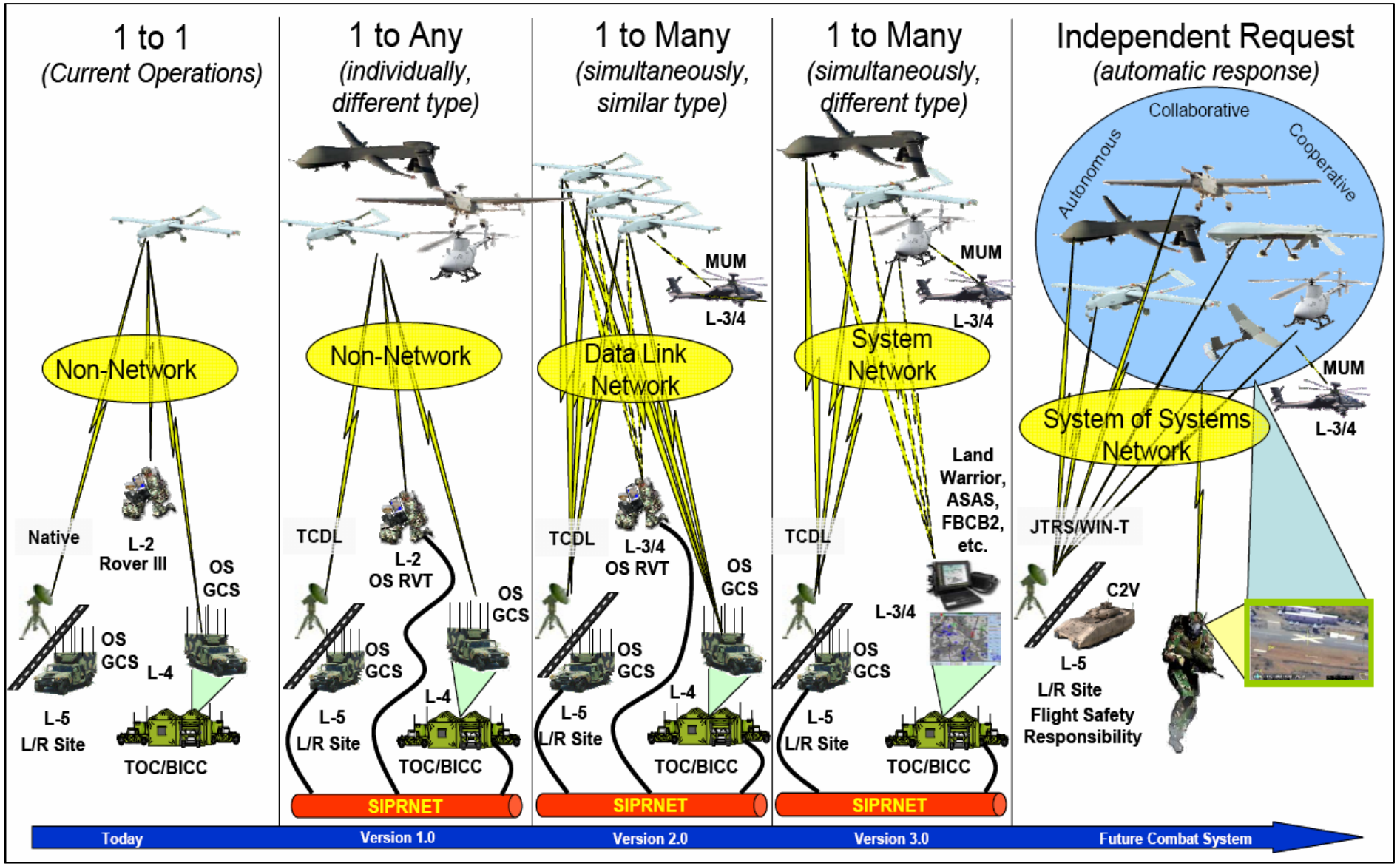
TRADOC System Manager Unmanned Aircraft Systems

UAS Interoperability Capabilities Road Map (Defined Capabilities)

UAS PMO Integrated Master Schedule

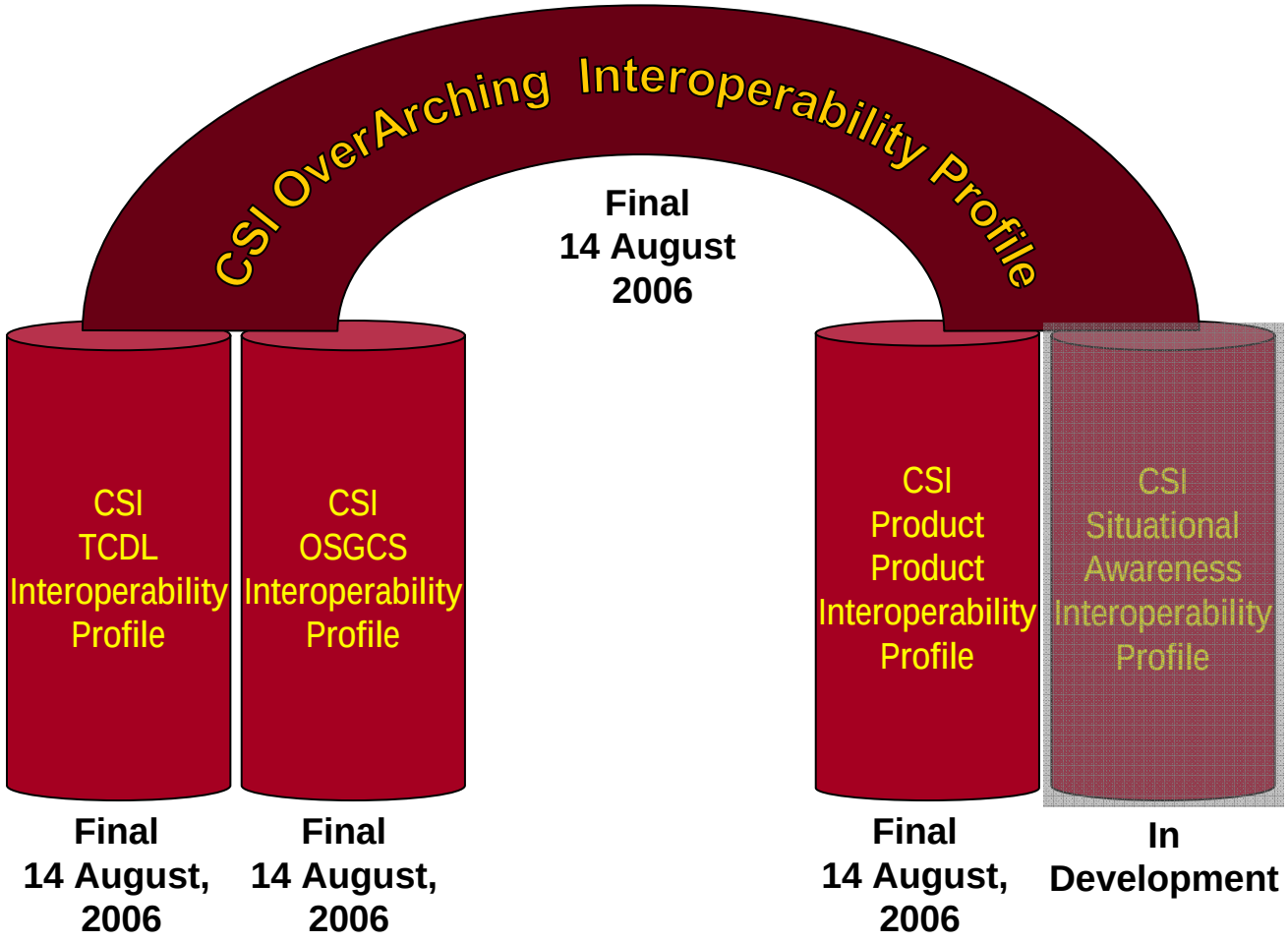
Do Not Yet Exist!

Architecture Vision



Army UAS Version 1.0 Interoperability Profiles

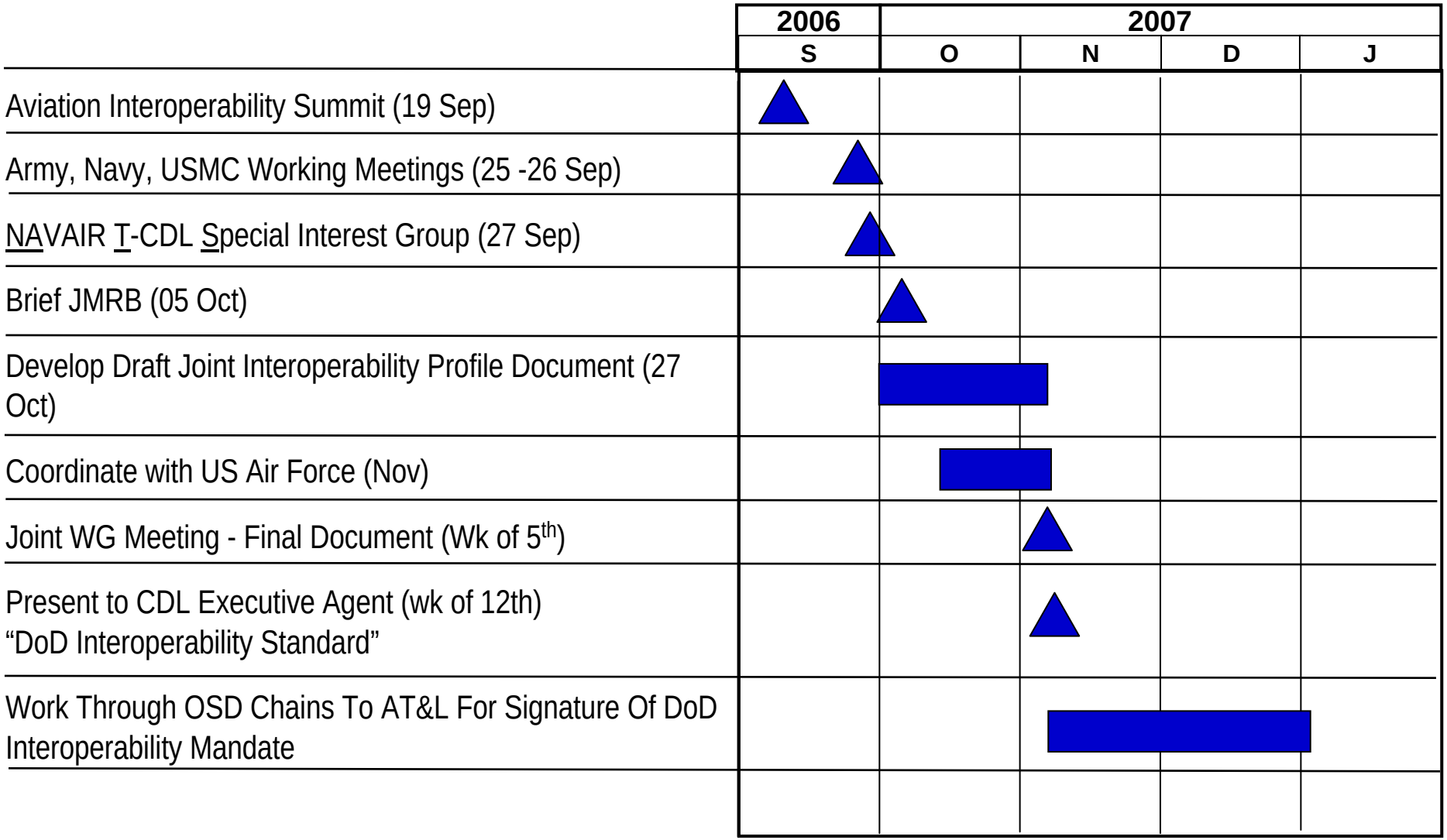
Describes End-to-End Interoperability from the Sensor to the Warfighter, Hot Swap Interoperability between Shadow and Warrior Platforms, and Growth to other Platforms. Includes Common Mission Planning, Training, and Warfighter Machine Interfaces.



Interoperability Profile Documentation

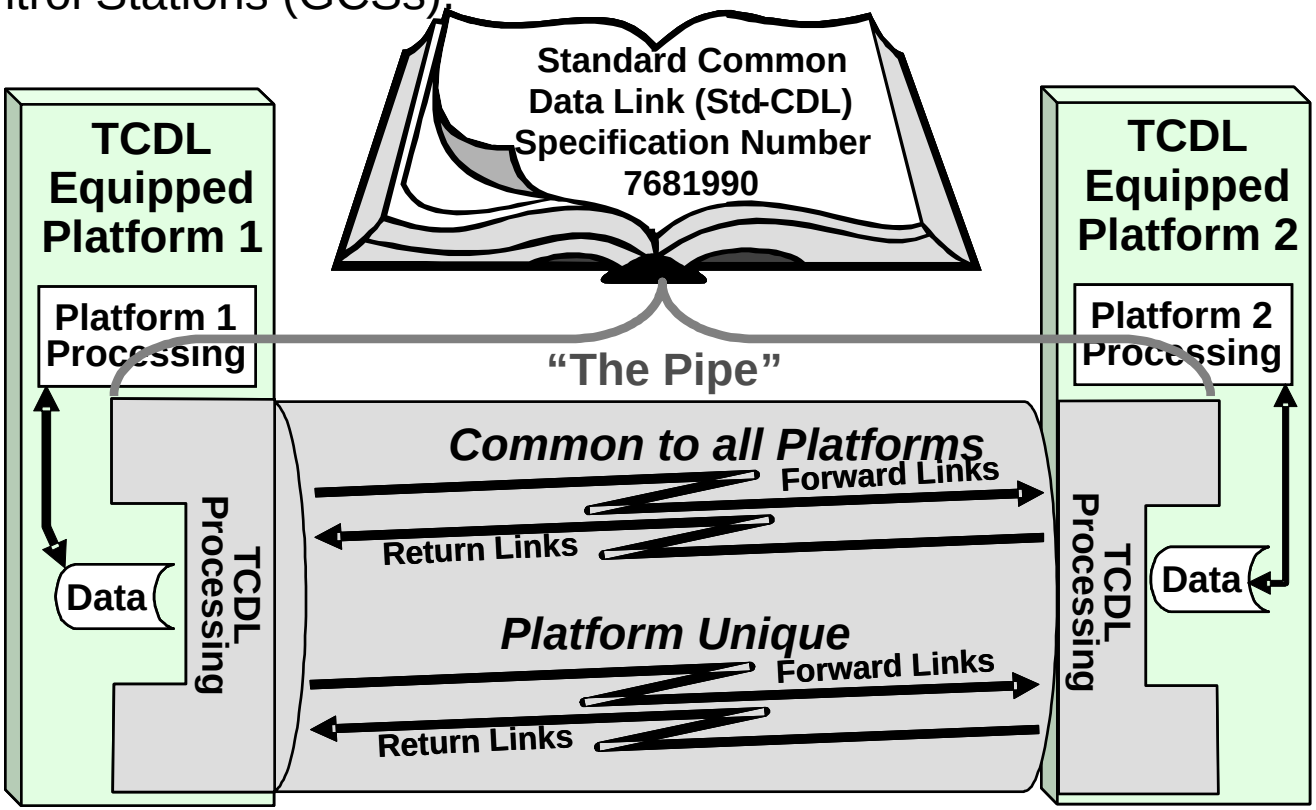
- Version 1.0 Interoperability Profiles
  - Draft Released Comments (05 May 2006)
  - Final Release (14 August 2006)
- Overarching Guidance
  - Compliance of Standards No Later than 4QFY08 or the Systems' IOT&E
  - Product Managers are Encouraged to Assess the Cost and Schedule Impacts of all CSI Guidance
  - 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 Pprogram 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



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

OSRVT	Blue Force Tracker	OSGCS	TCDL	Common Trainer
Common Product Dissemination IPT	Common Situational Awareness IPT	Common Control Systems IPT	Common Data Communications IPT	Common Logistics & Trainer IPT
1. One Systems Remote Video Terminal (OSRVT)	1. Blue Force Tracker (BFT) /FBCB2	1. STANAG/ Vehicle Specific Module (VSM)	1. TCDL/Digital Data Links	1. IMS (Trainers)
2. KLV/Meta Data	2. Link -16	2. Core UAV Control System (CUCS)	2. WiFi/WiMax	2. MUSE
3. C4I	3. Airspace Integration/ TAIS	3. Payloads / Weapons C2	3. Networks	3. IETM
4. Video Storage & Dissemination (PICTE Like)	4. Sense & Avoid / Collision Avoidance	4. Mission Planning / PFPS		4. Health & Usage Monitoring Systems (HUMS)
5. SmartCam		5. Vehicle Control Software (VCS)		5. Readiness Reporting
6. MPEG-2/H.264 Compression		6. Air Worthiness (Ground Implementation)		
7. Encryption		7. Common Takeoff & Landing System		
		8. GATM/CNS/ATM		

UAS Support

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