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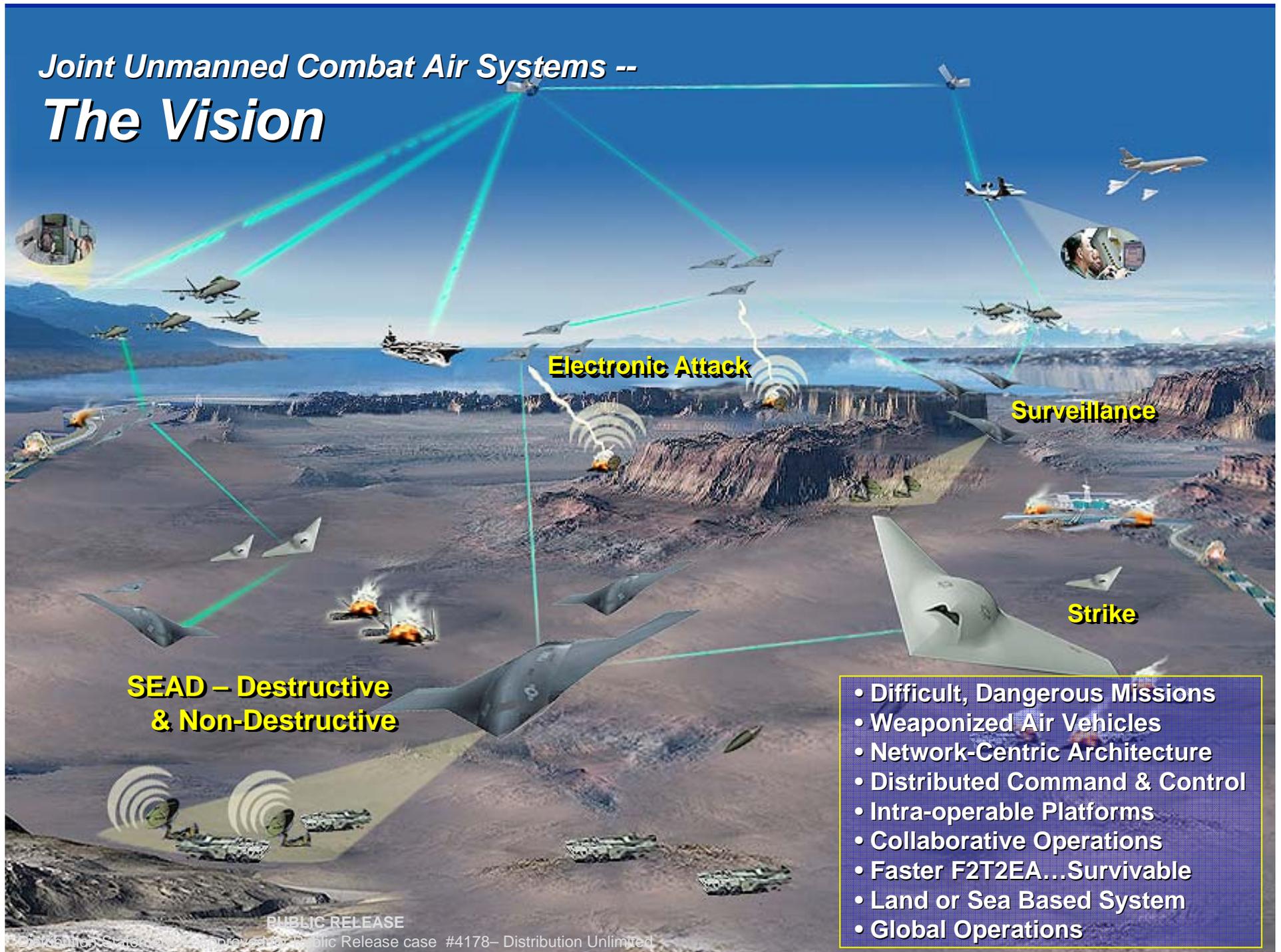
## **Program Update**

# **AUVSI's Unmanned Systems Program Review Washington, D.C.**

**Michael S. Francis,  
J-UCAS Program Director  
February 9, 2005**



# Joint Unmanned Combat Air Systems -- The Vision



**SEAD – Destructive  
& Non-Destructive**

**Electronic Attack**

**Surveillance**

**Strike**

- Difficult, Dangerous Missions
- Weaponized Air Vehicles
- Network-Centric Architecture
- Distributed Command & Control
- Intra-operable Platforms
- Collaborative Operations
- Faster F2T2EA...Survivable
- Land or Sea Based System
- Global Operations

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**Challenging Objectives --**

# **Toward an 'Operationalized' System**

**Boeing X-45C**



- TOGW – 36,500 lb
- F404-GD-102D Engine

**Northrop Grumman X-47B**



- TOGW - >45,000 lb
- P&W F110 Engine

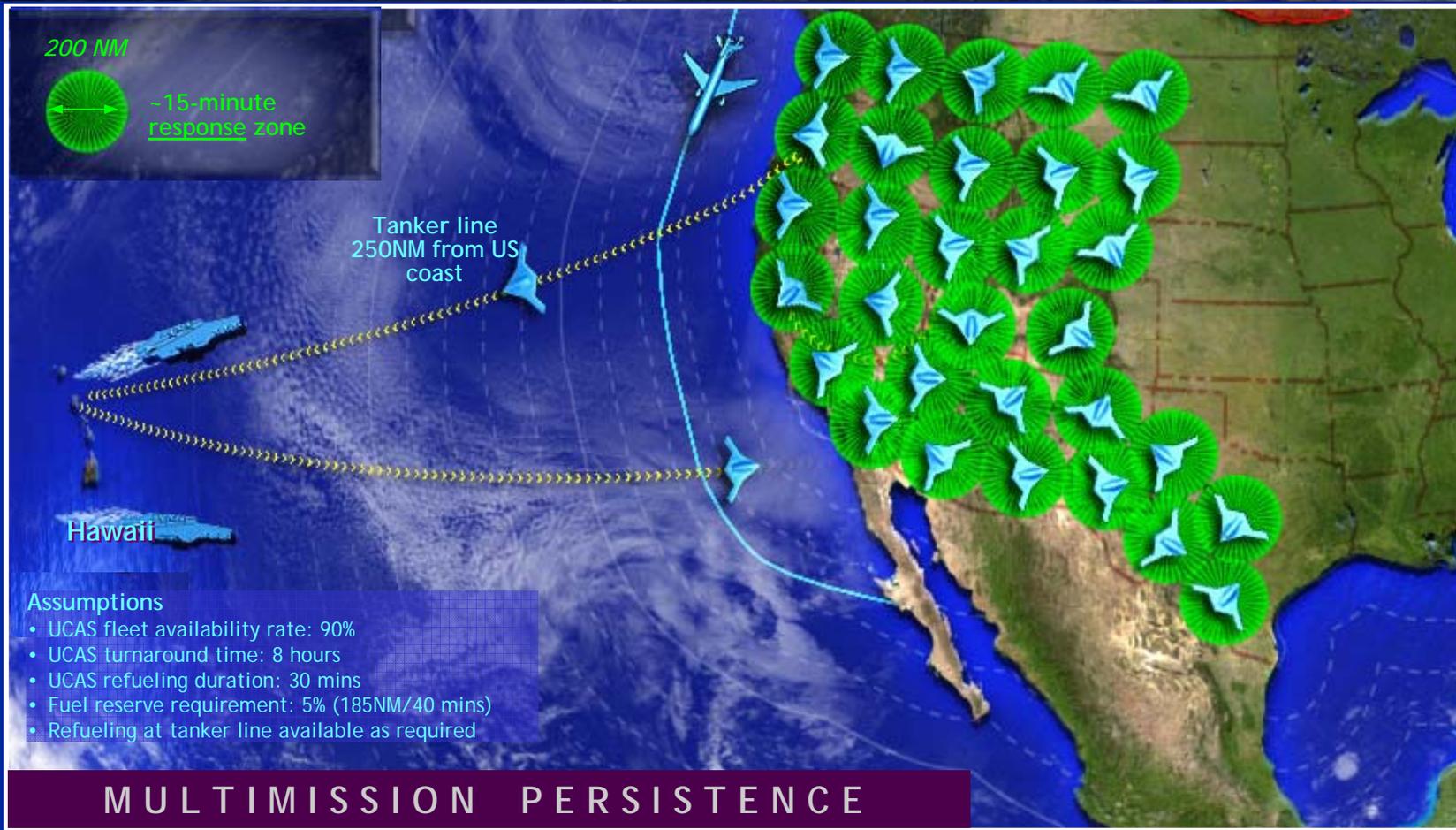
- **Range-Payload Performance**
  - Long Range – Combat Radius (1000+ nm)
  - Significant Endurance/Persistence
  - Payload Capacity (4500# plus Sensors)
- **Diverse, Versatile Sensor Capabilities**
  - ESM Capability
  - Synthetic Aperture Radar
  - EO / IR Sensor
  - EW / Electronic Attack Payload
- **Multiple Basing Environments**
- **Global Operations**
  - Air Refuelable
  - Civil Airspace Compatible
  - BLOS Command & Control
- **Survivable System Design**
- **Phased-in Attributes**
  - Sensors ... Payloads ... LO Features ...
- **Intra-operable Platforms**
  - ... thru the *Common Operating System*
- **Early Operator Exposure**
  - First Flights in 2007 ... OA Start in FY07

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# J-UCAS Multi-Mission Persistent Coverage in Perspective

*Illustrative 24/7 Surveillance-Attack Coverage of 100 a/c Fleet of X-47B-Class UCAVs*



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# J-UCAS Global Capabilities— AN AIR & SPACE SYSTEM

## Navigation

“Reach Forward –  
Reach Back”

## Communications

- Collaborative Sensing
- Missile Warning
- Sensor Cueing
- Bi-Static Ops

## Global Operations

- Airspace Deconfliction
- Large # of Platforms
- Coordinated C2-ISR
- Near Real Time

Theater C2

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# Currently Fielded UAV Functionality & Services' Expectations for J-UCAS



Predator  
Many : 1

Global Hawk  
1 : 1

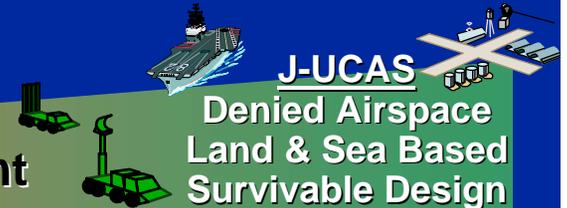
**Operator : Vehicle Ratio**

J-UCAS  
1 : Many

Predator & Global Hawk  
Secured Airspace  
Land Based



**Operational Environment**



J-UCAS  
Denied Airspace  
Land & Sea Based  
Survivable Design

Global Hawk  
Single Ship  
Days

**Mission Planning Time**

J-UCAS  
Multi Ship  
Hours

Global Hawk  
Dedicated Channel  
per Vehicle  
Large Bandwidth Blocks

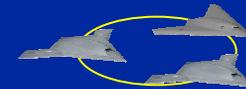


**Communication Management**

J-UCAS  
Shared Channels  
Quality of Service  
Net Ready

Fielded Systems  
Single Ship Only  
Stove-Piped Systems  
No Cooperation

**Cooperative Operations**



J-UCAS  
Multi Ship, Cooperative  
Targeting & Attack  
Interoperable

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# Joint Unmanned Combat Air Systems -- Successful 1<sup>st</sup> Generation Air Vehicles



## First Flight

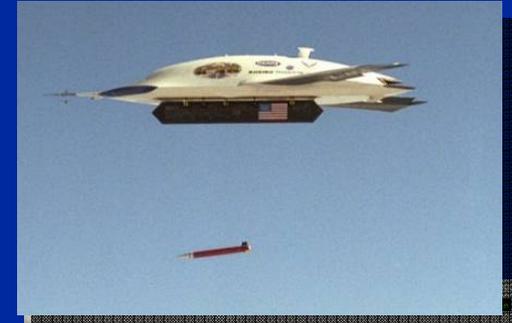
X-45A ... May 2002



X47A ... Feb 2003



X-45A Guided Weapon Demo ... Apr 2004



## Multi-Vehicle Operations ... Aug 2004 - Present

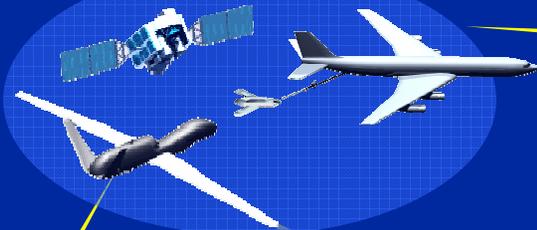


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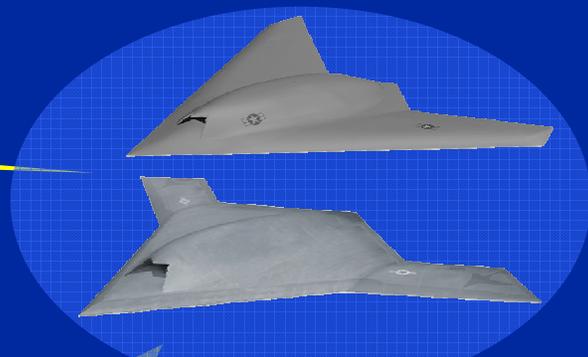
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# J-UCAS System Elements

## Operational Infrastructure



## Air Vehicle(s)



## Communications



## Control Station(s)

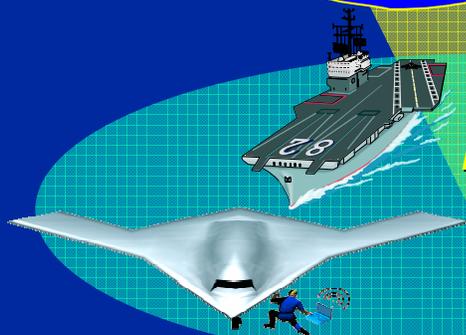
## Operating System

- Command & Control
- Communications
- Mission Planning
- Autonomous Functions
- Human-System Interface
- Health/Status

## Payload Systems

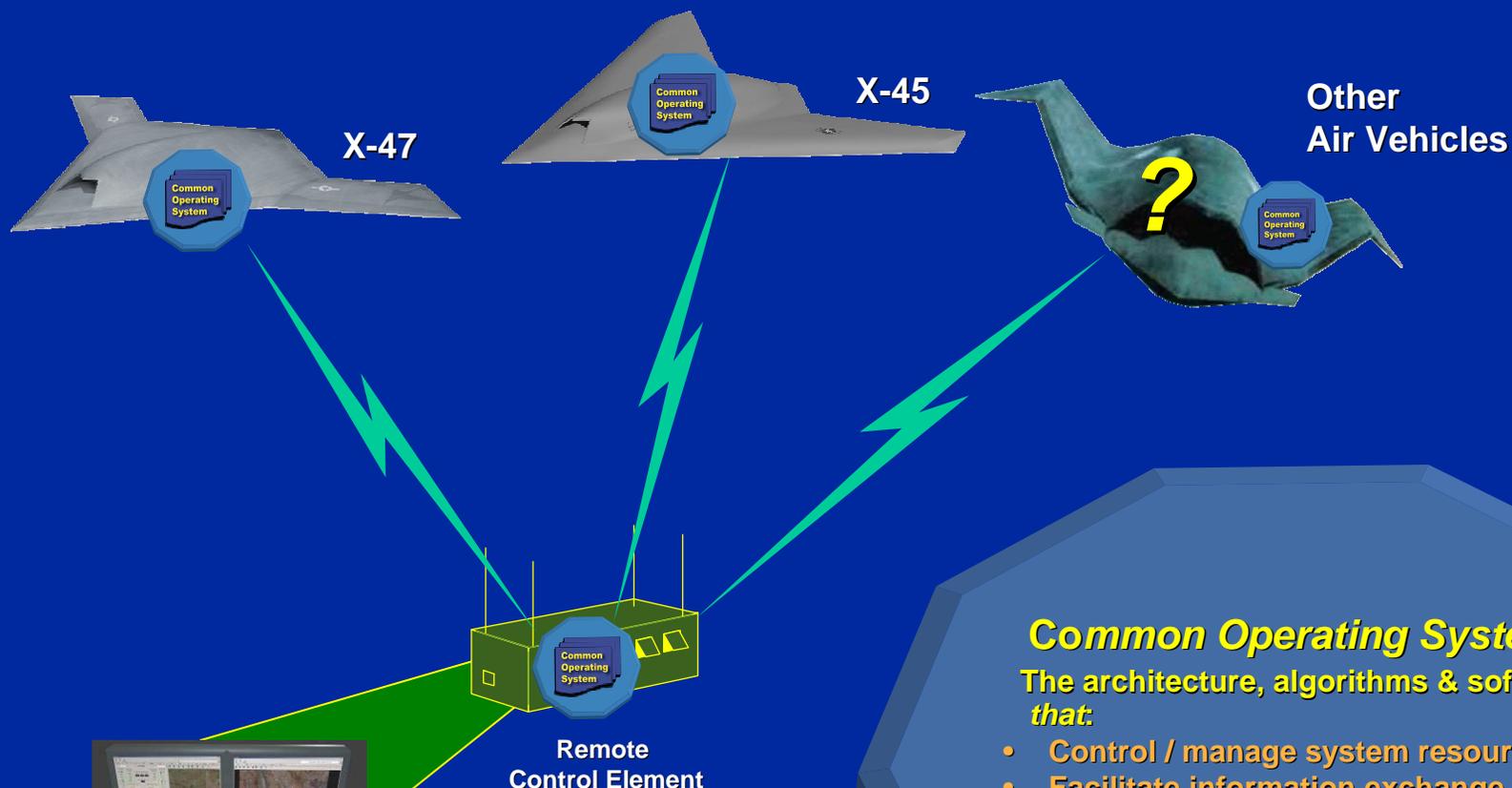


## Direct Support



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# Common Operating System



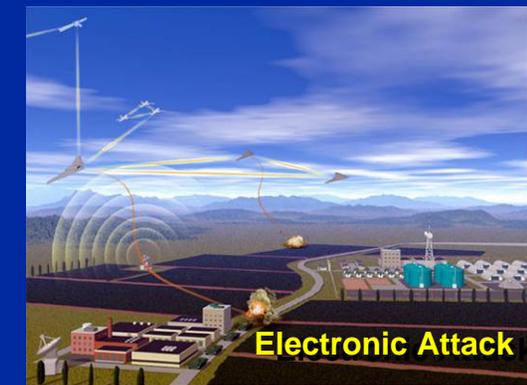
**Development Team**

- Air Vehicle Primes
- Integrator-Broker
- Technology Contributors

**Common Operating System**  
The architecture, algorithms & software, that:

- Control / manage system resources
- Facilitate information exchange
- Provide battlespace awareness
- Enable inter-platform functionality
- Enable autonomous operations
- Maintain quality of service

# Joint Unmanned Combat Air Systems -- Operational Assessment

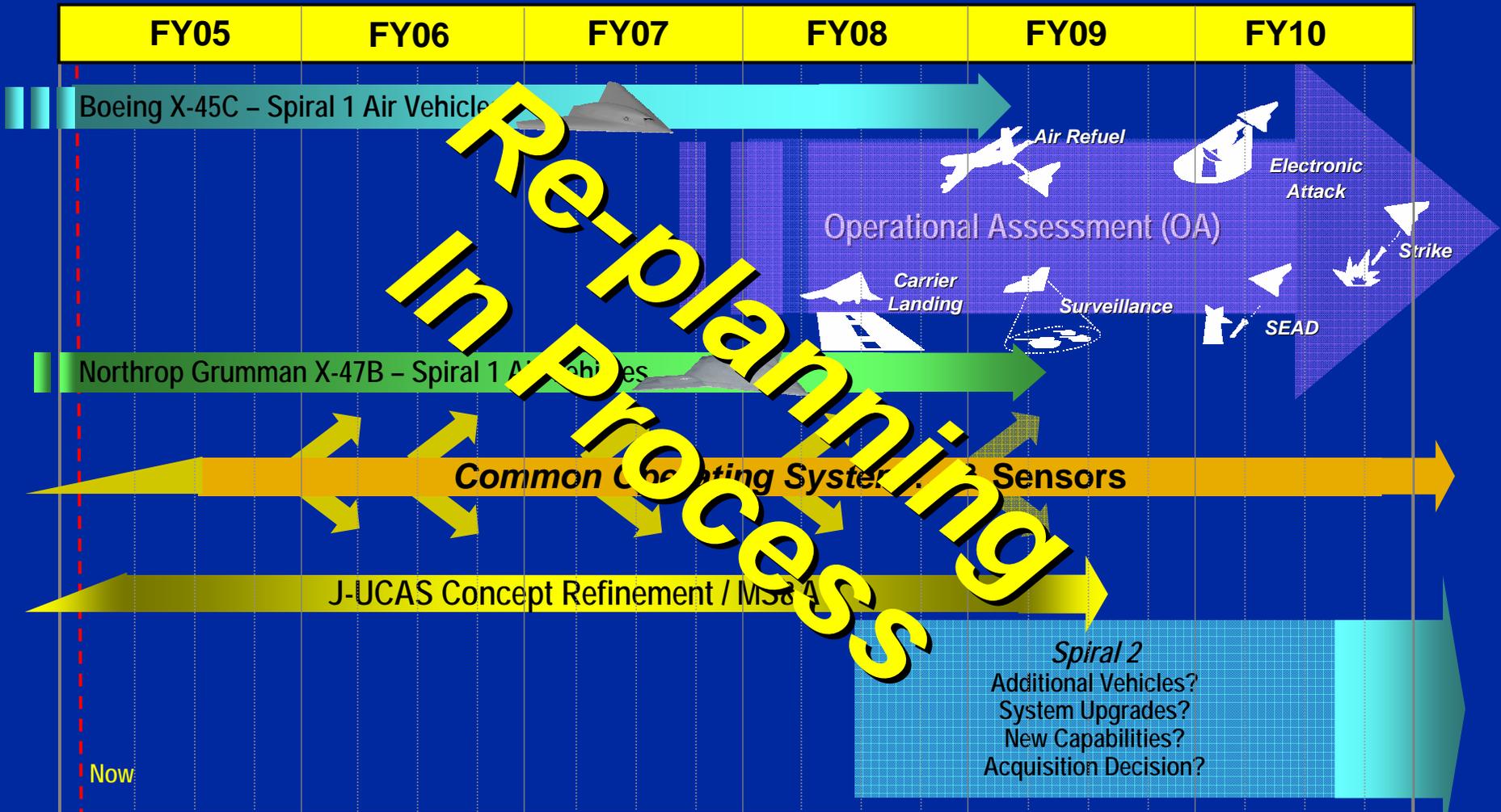


- **Service User Driven Activities**
  - Joint planning team
- **Exploration & Experimentation**
  - JFCOM
  - Sponsor commands
  - Other operational users
- **Assessments include:**
  - Baseline missions
  - CONOPS
  - Tactics exploration
  - Key capabilities
  - Interoperability
  - Crew interface(s) & effectiveness
  - Contingency operations
  - Supportability
  - Vulnerabilities

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# Program Evolution



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# ***Status Summary***

- **J-UCAS Program Underway**
  - Major Participants Fully Engaged
- **Versatile Capability Pursued**
  - Complementary Air Vehicles Address Diverse Mission Needs
  - *Common Operating System* Maximizes Operational Flexibility
- **Early Operational Assessment Activities Planned**
  - Provide Venue For Operator Experimentation
  - Address Operational User Needs ... Explore “Opportunities”
  - Facilitate an Acquisition Decision By DoD And The Services
- **FY06 Budget Has Triggered Program Re-planning**
  - Content/Schedule Revisited Due to Revised Budget
  - Transition to New Joint Service Organization in Work
  - Re-plan Oriented to Maintain Program Momentum



# Questions?

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