

# 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

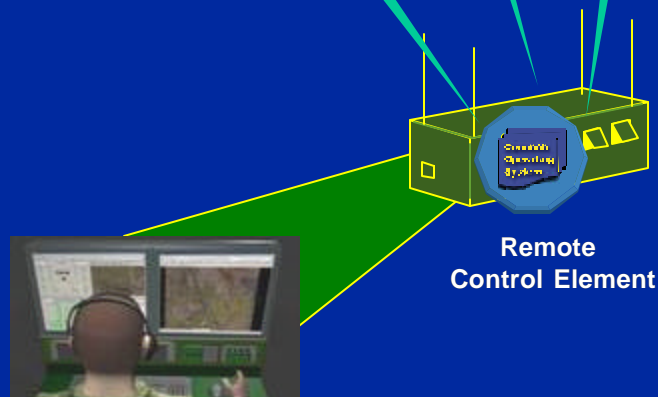
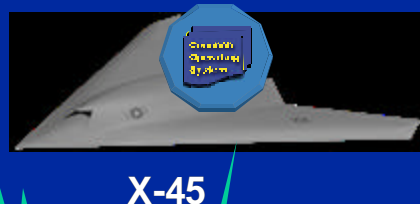
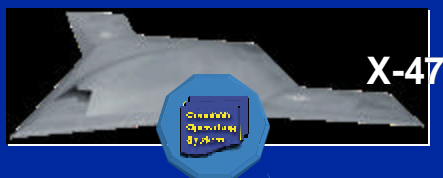


## Direct Support



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# Joint Unmanned Combat Air Systems -- Common Operating System (COS)



## • **What is It?**

- Primary Integrating Element of J-UCAS
  - The “Connect-the-Dots” Piece
- Architecture, Algorithms, Software & Services

## Key Functions --

- Control/Manage System Resources
- Facilitate Information Exchange
- Provide Battlespace Awareness
- Enable Inter-platform Collaboration
- Enable Autonomous Operations
- Maintain Quality of Service

## • **Why Develop It?**

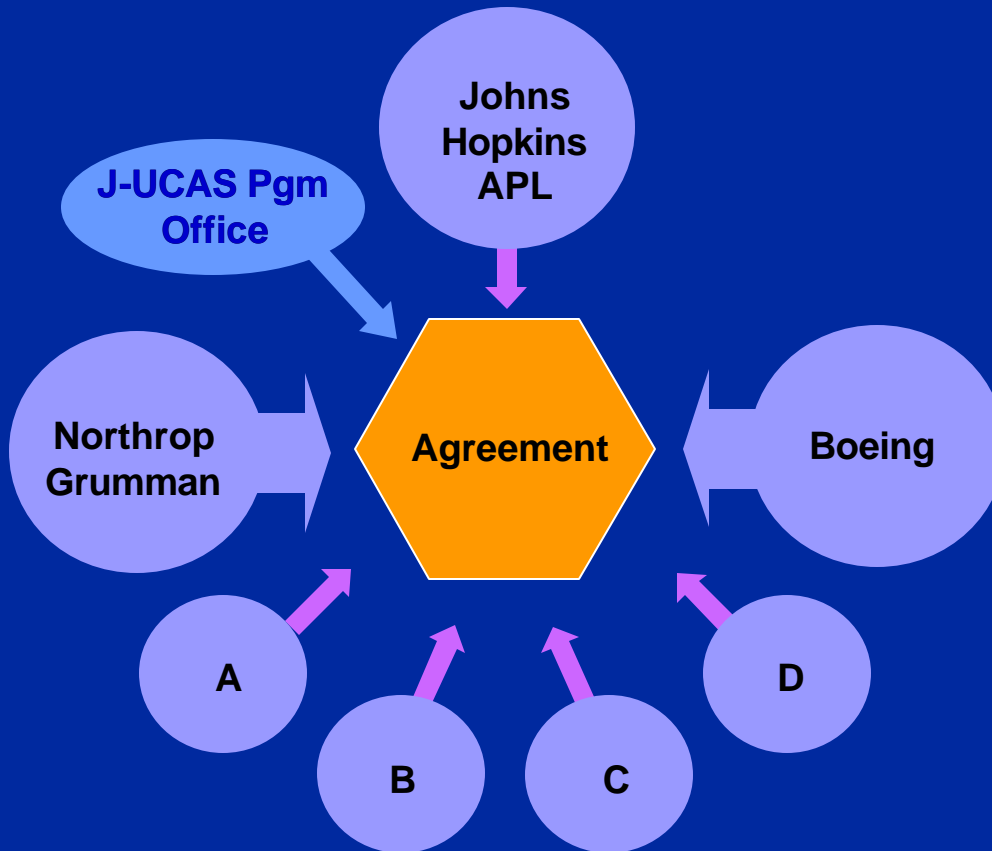
- Maximize System & Mission Flexibility
- Decouple System IT from the Platforms
- Reduce Development Cost & Risk
- Assure Intra- and Inter-operability
- Reduce Technology Barriers to Entry

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# Common Operating System

## Consortium-like Business Arrangement



- **Integrator/Broker/Observer**

Unique Role ... Not an LSI ... No Other Integrator ... Facilitator ... Referee  
No Intellectual Property

- **Program Primes – Key Stakeholders**

Fractional Ownership  
Platform Integrators – Physical, Functional  
S/W Developers  
COS Collaborators

- **Technology Contributors**

Based on Potential Contribution(s)  
Small Houses, Other Primes, Traditional Subs, Commercial Providers

**Business dynamics promote competition & ownership ...  
Increased idea pool decreases technology risk**

# Joint Unmanned Combat Air Systems --

## ... 'Raising the Bar'



Predator  
Many : 1

Global Hawk  
1 : 1

Operator : Vehicle Ratio

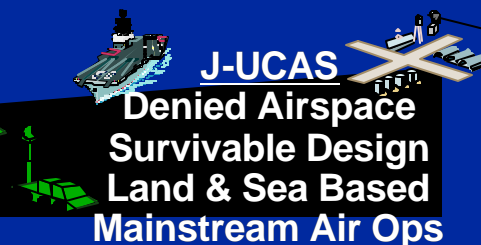


J-UCAS  
1 : Many

Predator & Global Hawk  
Secured Airspace  
Land Based  
Dissimilar Air Ops



Operational Environment



J-UCAS  
Denied Airspace  
Survivable Design  
Land & Sea Based  
Mainstream Air Ops

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

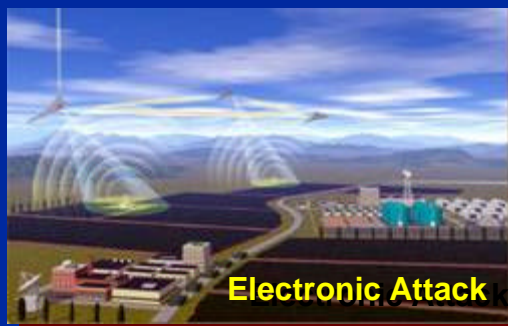
Cooperative Operations



J-UCAS  
Multi Ship, Cooperative  
Targeting & Attack  
Interoperable

... Proving Combat Value --

# Operational Assessment



- **Combat User Exploration & Experimentation**
- **Baseline Missions**
  - SEAD, Strike, ISR, EA
  - CONOPS
  - Tactics
  - Contingency operations
- **Key Capabilities**
  - Auto aerial refueling
  - Carrier operations
- **System Attributes**
  - Interoperability
  - Crew effectiveness
  - Supportability
- **System Vulnerabilities**

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# The Broader Challenges

- **Building User & Public Confidence - Cultural Acceptance**
  - Reliability & Safety ... Contemporary Expectations
  - Public Awareness & Education
  - Media Attention & Risk Aversion
  - Lethal CONOPs (UCAV)
- **Removing Regulatory Barriers**
  - Routine Airspace Control Accommodation
  - Vehicle/System Certification
  - Mixing Manned and Unmanned Systems
  - Treaty Implications (UCAV)
  - Other Legal & Liability Issues
- **Integration into the Infrastructure**
  - Operations & Basing
  - Logistics & Maintenance
- **Meeting Affordability Expectations**
  - Acquisition Costs
  - Operations & Support Costs
  - ... Surviving the “Bow Wave”



***The Keys to Acceptance & Commercialization***



# Questions?

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