Navy Unmanned Combat Air System Demonstration

Presentation to
Precision Strike Association
25-26 Jul 2006

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Navy UCAS Program Manager
The Future of Naval Unmanned Aviation

Outline

- Introduction
- Navy UCAS Evolution
- Carrier Demonstration (UCAS-D)
- UCAS-D Schedule
- Summary
Introduction

Program Goals:
- Demonstrate Carrier Suitability of Persistent ISR Relevant, Unmanned, LO-Planform Air Vehicle
- Mature Critical Technologies Prior to Potential Milestone Decision
- Maintain Competitive Environment

UCAS-D System Not Intended For Operational Use
UCAS Evolution

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DARPA UTA
5-8,000 lb … ‘Attritable’

Conventional Strike

DARPA-USAF UCAV ATD
SEAD Mission Focus

DARPA-Navy UCAV-N
Carrier Compatibility
Surveillance

X-45A
12,000 lb

X-45C
36,000 lb

X-47A
5,000 lb

X-47B
42,000 lb

J-UCAS
• SEAD
• Surveillance
• Strike
• Electronic Attack
• Carrier Ops
• Network-centric system concept

Navy UCAS

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Navy UCAS Development Roadmap

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Attributes:
- CV Suitable
- LO Planform
- Relevant to CV ISR Mission

Possible Attributes:
- CV Suitable
- Persistent ISR
- Some Strike Capability
- Aerial Refueling
- Survivable

Improved ISR/Strike Capability, Persistence, Survivability

UCAS CV Demo (UCAS-D)

2006 2012 2018 2023+

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Examples of UCAS Critical Technologies

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• Propulsion Technologies
  - Low Specific Fuel Consumption and High Specific Thrust Core
  - Integrated power generation
  - Thermal management system
  - Active inlet flow control

• Command & Control Technologies
  - GIG interface
  - Autonomous operations

• Survivability Technologies
  - Material supportability
  - Sensor integration

• AV Structure Technologies
  - Material weight/strength
  - Planform optimization
  - Manufacturing

• CV Integration Technologies
  - Deck Handling
  - CV operations

The Technology Maturation Assessment and studies and analyses by Johns Hopkins University APL will better define this list.
UCAS-D Scope

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- Objective
  - Carrier Suitability of Unmanned, Low Observable Planform UAS

- Scope
  - Carrier Control Area Operations
  - Launch Performance
  - Arrested Landing Performance Including Approach, Waveoff and Bolter
  - Deck Operations
  - Mission Control Segment (MCS) CV Integration
  - UCAS interface to CV
    » Primary Flight Control (PriFly), Landing Signal Officer (LSO), and Carrier Air Traffic Control Center (CATCC)
Maturity Challenge

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Technology Does Not exist today to make all four circles intersect

TRL 6 Definition:
- Representative model or prototype system tested in a relevant environment.
- Represents a major step up in a technology's demonstrated readiness
- Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment

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UCAS Overview & Transition

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## CV Demo Schedule

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- **CV Demo Schedule**
- **CV Demo**
- **OTA Follow-on**
- **Boeing**
- **Navy UCAS**
- **OTA Boeing**
- **OTA Northrop**
- **USG CV Suit Program**
- **NRE**
- **Ship Systems Planning and Development**
- **Ship Systems Installation/Support**
- **J-UCAS**

### FY04
- Edwards AFB or Pax River
- Initial envelope expansion
- PGPS
- CCA buildup
- Deck Control
- CV Maintenance/Support

### FY05
- • CCA Operations
- • Low Approaches, waveoff

### FY06
- • CCA ops
- • Low approach wave-off
- • Touch & Gos (bolter)
- • Deck Ops
- • Cat launch
- • Arrested Landing

### FY07
- • CCA Operations
- • Low Approaches, waveoff

### FY08
- • CCA Operations
- • Low Approaches, waveoff

### FY09
- • CCA Operations
- • Low Approaches, waveoff

### FY10
- • CCA Operations
- • Low Approaches, waveoff

### FY11
- • CCA Operations
- • Low Approaches, waveoff

### FY12
- • CCA Operations
- • Low Approaches, waveoff

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Summary

• Planning for UCAS-D Phase on track
• Focused on demonstrating the technical feasibility of operating a tailless, unmanned, LO planform aboard a carrier
• Potential follow-on efforts will be the result of detailed planning and available resources