Autonomous Aerial Cargo/ Utility System (AACUS) INP

Dr. M.L. Cummings
Code 35

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AACUS Motivation

Need: USMC Cargo UAS to rapidly support distributed forces, as an alternative to convoys, manned aircraft and air drops in all-weather, possibly hostile conditions.

Goal: Autonomous approaches & landings for unprepared landing sites, supervised by field operators with no special training, & integration across a variety of unmanned rotorcraft.

Challenges:

- Unprepared landing site selection and execution
- Dynamic contingency replanning until the point of landing
- A supervisory control system that any USMC personnel can operate
- Cultural attitudes
- Industry proprietary SW architecture

Proposed Deliverables

- Compact, modular low cost sensor suite
- Precision ops with no specially trained operator to include obstacle avoidance and unprepared site landings & recovery in DVE/ GPS denied settings
- Reliable critical cargo delivery
  - Long term focus on CASEVAC missions
- Flight demonstrations

Key AACUS Discriminators

- AACUS focuses on landing site selection AND real-time execution
  - Global (mission-centered) vs. local (vehicle-centered) control
  - Dynamic threat response and contingency planning

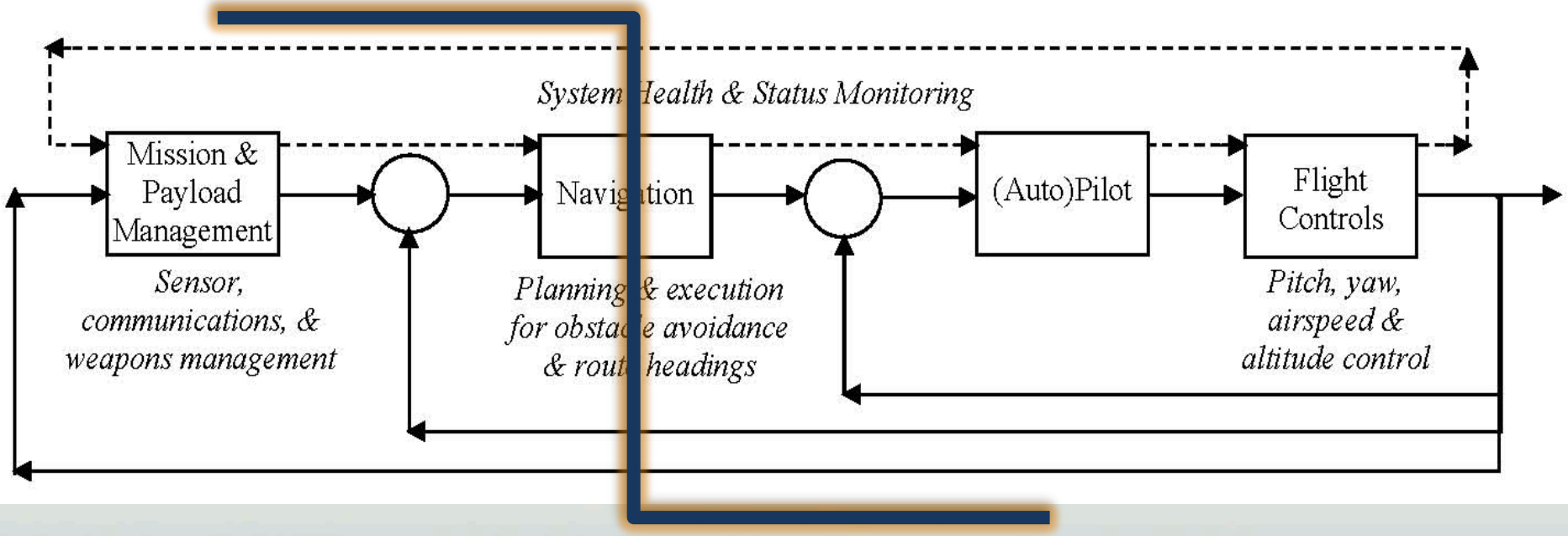
- ICUAS is a near-term logistics program, focused on prepared site landing with trained UAV operators.
  - Internal vs. sling load capacity

- MRMP/MRMUAS/Firescout are ISR programs
  - AACUS could complement these programs as well as manned platforms

- CASEVAC missions
  - Cargo missions more near term, medical missions more long term
  - Represent a major leap in trust and acceptance
    - Could potentially transform civilian applications

- Field personnel should be able to operate with no special training
  - Call for support under duress
  - Medics on board as a future option

Open Architecture Concerns



- Mission-centered Global Open Architecture Layer (GOAL) vs. local flight control algorithms
  - Open architecture vs. proprietary
  - The fallacy of plug and play
  - Feed forward vs. feed back of sensed data
  - The cost-benefit analysis deliverable

The Tentative Plan

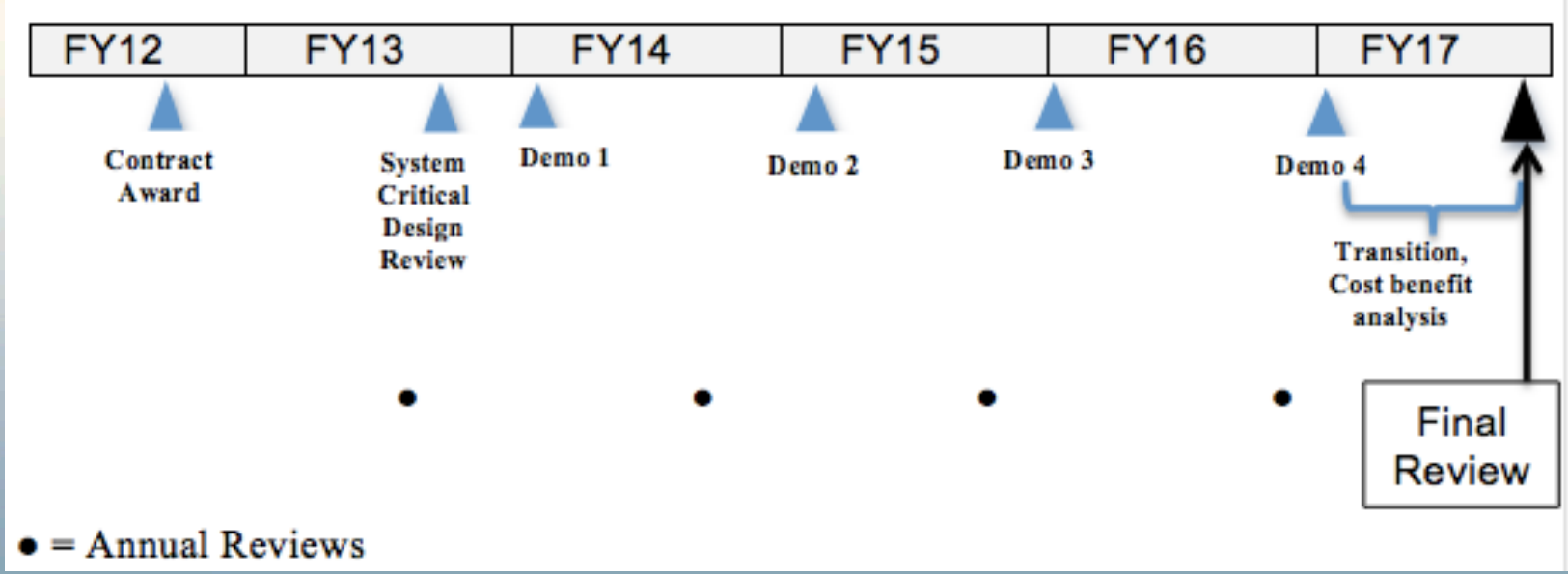
- Industry workshop
  - Goal is for industry, academia, and government labs & centers (UAV & UGV, platform & sensor) to understand the capabilities of one another
  - Establishing basis for team formations for potential BAA release
    - Team composition
    - Single vs. multiple awards
  - Questions today and tomorrow
    - More questions until 23 NOV
    - Updated CONOPS to be posted soon

- ~ 1 DEC BAA release
  - Two unique VTOL platforms with a common sensor package and three human-vehicle interfaces, using an open architecture framework
    - Must demonstrate portability across both platforms
    - Unmanned vs. optionally manned platform
  - Important Dates
    - 13 JAN 2012 BAA deadline
    - late FEB Source selection
    - APR 2012: Contracts issued pending signing of appropriation bill

Programmatics

- Initial contract expected to be for two years, with three option periods that align with Demos 2,3 & 4
- Budget of ~$5M for the first fiscal year, and ~13M per follow-on years
- STTR/SBIR future possibilities

- Transition opportunities at major milestones
  - To other UAS programs as well as manned programs
  - Commercial and other government agencies



Questions?