



Adaptive Airborne Enterprise FANTOM Core Mission Autonomy Behavior Integration Assessment Event

USSOCOM SOF AT&L PEO FW

Problem Statement: Given DoD's pacing challenges, USSOCOM seeks to enhance and extend the concepts and technologies to leverage its access and placement and provide long-range ISR & effects at scale to execute Special Operations peculiar (SO-p) missions.

This event will help USSOCOM identify technology providers capable of contributing FANTOM extensions and strengthening SDK integration for persistent autonomy evolution. Desired outcomes include:

- Catalog of proposed FANTOM extensions such as Behaviors, Planners, and other Services.
- Assessment of vendor capabilities to integrate with FANTOM using the SDK.
- Recommendations for vendors suitable for next-phase development.
- Industry feedback to refine SDK documentation and tooling.

Operational Use/Conditions: PEO Fixed Wing A2E program is seeking vendors that can integrate standalone mature (TRL6+) vendor adaptable behavior solutions with the FANTOM Core Mission Autonomy software stack. We are particularly interested in enhancing our capabilities in the areas identified below but are open to other unique solutions that may be of interest to USSOCOM:

- **Area Search (collaborative) Behavior**
 - Path planning, routing, and behavior control for multi-vehicle search that accounts for environmental and other constraints, adapts to changes in team composition, and/or uses a-priori information for more efficient search.
- **Route Planner**
 - Complex 3D Volumetric Avoidance: Three-dimensional path planning to dynamically route vehicles around and beneath multiple, complex, and overhanging volumes characterized by irregular geometries.
 - Energy and Time of Flight: Path planning to minimize energy (fuel/battery) usage, maximizing flight time, and/or desired time on target.
- **Weather Data Service**
 - Parses predicted weather (temperature, winds, precipitation, cloud levels) from filesystem, receives weather updates over a network, identifies 3D volumes to avoid, provides data and avoidance volumes to other Services such as Behaviors and Planners.
- **Multiple sUxS Platforms Maintaining Custody of Multiple Mobile Targets**
 - Multiple Target Track Custody: Given X UAVs, this behavior must maintain track custody on N targets. The goal is to maximize target custody even if the UAVs are attrited and balancing risk, objectives, and sensor capabilities. Track custody involves planning, monitoring, and execution of flight paths, sensor pointing, and resource allocation





(which UAV/sensor is used for what). Behavior must account for non-target entities in the vicinity.

- Balancing Search, ID, and Track: Behaviors to balance search, ID, and track functions where:

- 1) the number UAVs is greater than or equal to the number of targets;
- 2) the number UAVs is less than or equal to the number of targets;
- 3) the number UAVs is much less than the number of targets

Behavior should adjust behavior based on required track quality level.

- **Prioritized Network Data Transmission**

- Mission-state Aware Full-Motion Video Management: Manages video streams from a swarm to multiple data consumers by prioritizing and managing data streams.





If the industry provider has a method to augment the mission autonomy, we would like to understand what functionality you have that can be added to the abilities of the Mission Autonomy system. Responses should reference ALL queries identified below. Please be as descriptive as possible in your responses.

1. Which FANTOM Extension service would your software provide as an integrated capability using mature, flight demonstrated, code?
2. How does your software service address the objectives above?
3. Please provide a notional architectural diagram or view of your service integrated with the FANTOM Core Service architecture (ref the SDK User Guide or FANTOM Services view of the MBSE model).
4. What limitations of the FANTOM architecture do you recommend addressing to support the integration of your service and how? How can you help solve these?
5. What is the TRL level demonstrated of your existing behavior service?
6. What developmental services (e.g. dev ops pipeline, simulation environment, hardware integration support, HMI) do you require from the integrator, to support your service integration and demonstration?
7. Describe how you can provide containerized services that leverage and do not duplicate the existing FANTOM services.
8. Describe any dependencies required for your containerized services?
9. What are the risks you need addressed to perform within the FANTOM autonomy architecture?

