



The MITRE Challenge

Phase 1 Submission

White Paper Sections

Applicants must submit a white paper describing their system that includes the following items. The paper must be no more than 15 pages long; links or references to additional material will not be reviewed.

Introduction and Overview

1. Contact Information

- a. Provide your company/team name, the name of the system, affiliation, and a primary POC (to include email and phone number)

2. Category

- a. Select the category that best describes your system:
(A) Detection/determination only, (B) Interdiction only, or (C) Complete end-to-end solution

3. Company/Team Overview

- a. Give a short overview of the history of the company and/or the team which developed the system solution

4. System Overview

- a. Give a general overview of the system including a description of the sensor technology, processing algorithm, and interdiction method as applicable.
- b. Describe unique dependencies or risks for your system (Examples: authority for RF jamming, hazardous materials, physical danger zones, etc.)
- c. Describe the key small UAS features that your system exploits (Examples: RF emissions, metal components, heat signature, etc.)

5. Technical Specifications

- a. Include technical specifications of your system
 - Power requirements
 - Size
 - Weight
 - Environmental constraints

System Description

Provide details about your conceptual design, at a level sufficient for reviewers to understand the technical efficacy of your proposed design. Be sure to explain your design's existing maturity (examples: summary of lab testing, live flight-testing, and exercises or events in which your system has participated, etc.)

1. High-level Concept of Operations

- a. Provide a high-level concept of operations for how the system would be used.
- b. Example scenarios would be useful.
- c. Briefly describe analysis and testing done to confirm performance.

Note: Complete sections 2 and 3 as applicable to your proposed system. The more information you provide, the more confidently we will be able to evaluate it against other proposals

2. Detection/Determination Technical Approach

Detection and Tracking

- a. Describe the detection modalities used, e.g. radar, RF detection, EO/IR cameras, etc. Consider including more details on effective range, altitude above the surface, resolution of target, and probability of detection.
- b. Describe your system's capabilities to detect one or more small UAS.
- c. Describe any operational constraints of your system, e.g., susceptibility to interference from atmospheric, etc.
- d. Describe the tracking algorithms used to track one or more potential targets. Describe the algorithms' pedigree, if applicable.

Determination

- a. Describe your approach to determine if a UAS is a threat based on its trajectory.
- b. Describe how your approach deals with maneuvering aircraft.
- c. Describe any operational constraints of your system, e.g., the maximum number of systems that can be tracked simultaneously, etc.
- d. Describe how a human operator is notified when your system perceives a potential threat.

3. Interdiction Technical Approach

- a. Describe your system's interdiction approach.
- b. Describe how your system can interdict multiple small UAS at the same time. Consider including more details on recovery time between interdictions or other operational constraints.
- c. Describe the expected results of the interdiction e.g., will it crash, land safely, return to launch point, etc.
- d. Describe any operational constraints of your system, e.g., range, interference, atmospheric, etc.
- e. Describe the input your system requires to perform interdiction.

4. Operational Requirements

- a. Explain the requirements for deploying your system, including the number of personnel required to operate the system and any specialized training requirements.
- b. Explain the maintenance requirements of the system.
- c. Describe the environmental requirements required to operate system, including need for power, shelter, mounting requirements, etc.

5. Initial and Recurring Costs

- a. Provide a cost estimate for the initial and recurring costs including consumables.
- b. Provide a basis and explanation for these estimates.

Alignment to Challenge Criteria

Explain how your system satisfies the objectives of the challenge. The following items form the basis of the criteria we will be using for the first downselect of the competition. Please write to each and include any other information that you feel reviewers will require.

1. Aligning with Domestic Safety and Legal Requirements

- a. Explain how your system would be deployable in a populated, U.S. domestic environment, with consideration of public safety and applicable laws and regulations.
- b. If these laws/regulations were relaxed during an emergency situation, how would this affect your system's capabilities?

2. Affordability

- a. Explain how your system would be potentially deployable on a large scale to protect a wide variety of interests, from critical infrastructure, to sensitive security locations, to civil airports.

3. Technical Scalability

- a. Explain how your systems can function against multiple simultaneous threats.
- b. Explain how your systems will be able to continue to be effective as UAS technology evolves and steps that might be taken to defeat detection, identification, and interdiction.

4. Additional Value

- a. Explain additional advantages or value your specific solution might bring to the community concerned about unauthorized UAS operations, e.g., whether your system can identify the operator and/or the operator's location of the aircraft characterized as a threat.

5. Technology Readiness

- a. Using the Office of the Secretary of Defense Technology Readiness Assessment (TRA) document, section 2.5, estimate your system's current and future (by fall of 2016) TRL.
 - *Note: there is no minimal TRL for the Challenge, this is just a tool to help us understand your current capabilities.*
- b. Include a summary of any laboratory experiments, field trials, operational evaluations, and/or deployments.