AFWERX Prime Innovative Capabilities Opening (ICO)
Autonomy Proving Ground Fly-Offs - Call 0001

Issued as a part of ICO Number	FA228024R0007		
Open Date:	31 January 2024	Close Date:	1 August 2024
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Performance Restriction:	**Restricted to US based firms only (Export Controlled)**	Status: **Open**	Accepting Solutions?: **Yes**

Table 1: Call 0001 at a glance

1. Introduction:

Under the authority of 10 U.S.C. § 4022, the AFWERX Autonomy Prime (AFRL/RGP) Office is pursuing prototype projects from nontraditional and traditional defense contractors. These projects will help the Government assess and accelerate emerging autonomy technologies in partnership with industry. This effort seeks to establish a collaborative strategy with industry and investors that accelerates fielding of the most promising technologies for savings and utility to the Government, as well as potential commercial market success. As these systems mature toward certified commercial operations, the Government will identify opportunities for early adoption, with the potential for procurement and fielding through this ICO.

2. Background:

AFWERX, acting as an innovative acquisition arm of the United States Air Force, launched the Agility Prime program in 2020 with the goal of accelerating the development timeline of transformational vertical lift technologies revolving around distributed electric propulsion. The program was designed to partner USAF expertise and resources with commercial aircraft developers and investors to field aircraft on a shortened timeline for both military and civil use cases. Since the program was launched, the Air Force and partners have demonstrated credible success in reducing regulatory, technical, and financial risk across multiple aircraft development programs, while paving a path for initial operations.

AFWERX Prime has taken the lessons and successes from Agility Prime and expanded with the addition of Autonomy Prime. Autonomy Prime has been deeply exploring autonomy technologies to better understand their maturity and relevance to the Air Force mission set and investment portfolio, and has formed the following conclusions.

- Technological dominance in autonomy and associated subtechnologies will be critical to the future success of the United States Air Force as well as the United States at large.
- The USAF Acquisition and Test enterprise is and will continue to face challenges regarding the resources, expertise, and experience developing and fielding autonomous capabilities to match the expected future demand or needed pace of development.
- There exists outside of the traditional DOD industrial base and AF investment or R&D portfolios, an enormous quantity of valuable existing autonomy technologies as well as expertise and resources to develop additional technologies.

<u>Based on the above, AFWERX's Prime division is launching the Autonomy Proving Ground</u>

3. Problem Statement

Robust, reliable and accurate navigation required for safe travel around the globe has been a core challenge for human civilization for millenia. In modern times, through national level multi-decade investments in systems such as the Global Positioning System (GPS), the challenge of navigation has largely been overcome. GPS has become such a prevalent and widely available technology that it is core to the basic function of civil and military operations across all domains today. Should GPS be unavailable for any reason - terrain, weather, technical failure or active adversary action - the loss of the system would be deleterious to the success of any operation. This is particularly true for small unmanned systems, which typically rely on GPS as their only navigation solution due to Size, Weight, Power, and Cost (SWAP-C) constraints and do not have the luxury of onboard human operators as contingency.

4. Objectives

This Autonomy Proving Ground Fly-Off will focus on alternate navigation solutions designed for small unmanned aircraft. These solutions may include systems which leverage any or multiple of the below techniques as well as other novel solutions for navigation.

- Visual reference
- Inertial
- Timing propagation via signals
- Magnetic
- Solar/Astrological

It is the aim of the Autonomy Prime team to create a low effort, low cost, competition style environment which enables any and all potential navigation solution offerors to credibly demonstrate their solutions onboard sUAS to USAF test professionals for assessment.

AFWERX seeks to eliminate or significantly reduce many of the challenges and costs associated with executing demonstrations or test events with the Government, such as

- Contract negotiation and award
- Range/Hangar Access

- Airspace Clearance
- Test Planning
- Testbed cost & availability
- Military Flight Release process

The navigation systems under test will be evaluated against the following metrics:

- Accuracy (in varied environments such as desert, forest, urban, maritime) in terms of drift (meters) over time of flight or distance traveled
- System Size, Weight, and Power requirements placed upon host aircraft
- Cost in procurement and sustainment
- Modularity/Ease of Integration - difficulty of integration into various UAS and Autonomy systems

Fly-Offs will result in USAF test reports validating the observed performance of the navigation system. These reports will be sharable by Fly-Off participants with their potential commercial and Government customers as credible 3rd party evaluations of the system technology.

Systems which demonstrate highest levels of performance over the Fly-Off test program as evaluated by USG team may receive funding in the form of follow-on development contracts focused on the integration of selected navigation systems into ongoing active sUAS development or sustainment programs such as AFSOC's Adaptive Airborne Enterprise.

5. Procedure:

The Fly-Off will consist of several phases:

a. Solicitation Phase (specific Call procedures are explained in Section 7)
    i. Pitch-Deck Submission and Evaluation (which includes an eligibility determination)
    ii. Request for Proposal
    iii. Proposal Evaluation
b. Contract Award
    i. Negotiation
    ii. Other Transaction for Prototype Award
c. Test Planning
    i. Adjudication of any required modifications to base Fly-Off test plan based on specific system under test.
d. System Integration onto Autonomy Prime Testbed Aircraft
    i. Integration of test subject hardware + software into Autonomy Prime Testbed (Interface Control Document (ICD) and Application Program Interface (API) will be provided during RFP phase of solicitation) at Eglin AFB, FL.
    ii. Ground Checks of the system completed.
e. Flight test events

i. The Autonomy Prime testbed will attempt to fly predetermined course(s) using navigation solution(s) provided by the test system. Divergence from optimal course will be allowed and monitored up to a predetermined geofence. Error from optimal course will be measured.

f. System Disassembly from Autonomy Prime Testbed Aircraft
   i. Test subject hardware + software should be removed from the Autonomy Prime Testbed and the Testbed returned to its original configuration.
   ii. Inspection by the USAF test team to ensure the Testbed configuration has returned to its baseline and all performer assets have been returned.
      1. Test Report preparation
         a. USAF test team will prepare an official test report evaluating the test system for above criteria.

g. Anticipated Deliverables

Deliverable	Description	Acceptance Criteria
Flight test planning materials ncluding system specifications, AW questionnaire, ICDs, requested adjustments to flight test plans.	Delivery of required materials to complete accelerated USAF Test Planning Process.	Signed and Approved Flight Test Approval
Navigation System Testbed Integration	Successful integration of system under test onto test aircraft	Ground Checks completed successfully
Flight Test	Aircraft and system under test complete flight test plan successfully	AF FTE acquires needed test data successfully.
Flight Test Report	AF test engineers deliver final test report	Signed Test Report delivered

6. DEFINITIONS

a. Definitions in the ICO FA228024R0007 are incorporated by reference.

b. “Fly Off" is a specific opportunity under this ICO where specific technologies and or solutions to problem sets will be solicited. Participants selected to participate in a Fly Off will showcase and or demonstrate capabilities per contract at the Autonomy Proving Ground. Fly Off opportunities will be posted on https://sam.gov website.

c. “Open Period” refers to the date that a Call is open for offerors to submit solutions. Solutions will be evaluated as soon as practicable (i.e., as they are received) and awards may be issued during the open period. Evaluations and awards may be made after the closing date for those submissions received prior to the closing date and time provided within the Call. Solutions submitted after the closing date will not be considered.

7. Call Procedures

   a. This Call is soliciting innovative capabilities aligned with Autonomy Prime and the Department of the Air Force's Autonomy Interests to be presented and tested at the Autonomy Proving Ground. The Call will consist of one or more separately published Fly Off or activity where specific problem sets or objectives will be issued and interested parties will respond with a Pitch Deck. All Pitch Decks submitted in response to any published Fly Off will be in response to, and governed by, this Call.

   b. Open Period - this Call is an open solicitation with a closing date of 5:00 PM EST 08/01/2024.

   c. Step 1 - Pitch Deck Submission - Submit a not-to-exceed (NTE) 10 slide Pitch Deck using the web form found at this link: https://forms.gle/Vrpvp7w76qL7kjjd8 . Pitch Decks should generally contain the following information. Alternatively, Pitch Decks may be delivered via email to prime.ico@afwerx.af.mil

      - Company Background, History, Size
      - Overview of Navigation System (technical information, cost, capabilities, etc)
      - Estimated SWAP-C requirements of system
      - Estimations of navigation solution accuracy (in various environments if performance varies)

      i. In the event that an offeror submits a Pitch Deck exceeding 10 slides, only Slides 1 through 10 will be considered by AFWERX evaluators. Excess slides will be removed prior to review and will not be considered by AFWERX evaluators.

      ii. Any other correspondence must be submitted electronically to the Agreements Officer point(s) of contact identified in Table 1 located at the beginning of this Call.

      iii. Submissions sent through other communication channels, or after the open period has closed will not be considered.

      iv. The Government will not pay submitters for the costs associated with Pitch Deck submissions, site visits, or developing materials for proposals, unless otherwise stipulated within this announcement.

      v. Unnecessarily elaborate Pitch Decks are not desired. Use of diagram(s) or figure(s) to depict the essence of the proposed solution is strongly encouraged.

      vi. Foreign Participation – Foreign persons or foreign owned firms are precluded from participation.

vii. Pitch Decks may only provide one solution meeting the objectives described in this Call. However, offerors may submit multiple Pitch Decks in response to a single Call.

viii. All Pitch Decks shall be unclassified. Pitch Decks, Site Visit, and Proposals containing data that is not to be disclosed to the public for any purpose or used by the Government except for evaluation purposes shall include the following statement -

"*This [select one: Solution Submission or Proposal] includes proprietary information that shall not be disclosed outside the Government, except to non-Government personnel for evaluation purposes, and shall not be duplicated, used, or disclosed -- in whole or in part -- for any purpose other than to evaluate this submission. If, however, an agreement is awarded to this Offeror as a result of -- or in connection with – the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent agreed upon by both parties in the resulting agreement. This restriction does not limit the Government's right to use information contained in this proprietary information if it is legally obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]"*

d. Step 1 - Pitch Deck: Basis of Evaluation

i. Eligibility: The entity must be registered via SAM.gov and be eligible to receive federal awards. Note: Awards under this effort are not anticipated to be assistance instruments i.e. grants. The entity must be eligible for prototype award under 10 U.S.C. § 4022(d).

ii. Technical Feasibility: Pitch Deck briefs must adequately demonstrate the ability to achieve stated technical objectives and address the offerors understanding of the needs/requirements listed within the specific call. The Pitch Deck must, at a minimum, describe the solution's ability to meet the stated objectives in this Call or provide enough information to describe a path by which the solution may be adapted to meet the objective/requirement.

iii. Importance to the Government: The Pitch Deck must adequately demonstrate its perceived importance to the Government. This should be related to stated missions, objectives, characteristics, relevant operational imperative or perceived fit within a technology area based on the vendor's understanding of the technology being proposed.

e. The Government may elect to use external market research in the evaluation of an offeror's viability. The Government holds the right to select all, some, or none of the solution submissions submitted in response to the applicable call.

f. Step 2 - Request For Proposal (RFP): Submission Content

i. The second and final Step of the ICO process is the RFP. Based upon the results of Step 1, the Government may issue an RFP. If that occurs, an offeror, or offerors, will be invited to develop and submit a written proposal as well as negotiate appropriate terms and conditions, as applicable, governing the proposed solution and/or prototype. At this stage, the selected offerors may discuss proposal development details during the proposal writing process with their assigned Government subject matter expert(s). Each proposal submitted shall consist of two sections: Section 1 shall provide the technical proposal; Section 2 shall address the price/cost/schedule portions of the proposal. Additionally, offerors are invited to provide their own internal terms and conditions that may be consolidated with those of the Government. This includes Service License Agreements (SLA) and/or User License Agreements (ULA).

ii. Instructions to Offerors will be provided in each RFP.

iii. Prior to the award of any contract or agreement, Submitters may be required to submit a DD 2345; Militarily Critical Technical Data Agreement.

8. Non-Government Advisors

a. Offerors are advised that data submitted to the Government in response to this solicitation may be released to individuals who work for the following Government support contractors:

i. Modern Technology Solutions, Inc. (MTSI)
ii. Peerless Technologies

9. This Call shall not be construed as a contractual or award commitment on the part of the Government, as an acceptable proposal, successful negotiations, and appropriate and available funding are prerequisites to the issuance of a contract, grant, assistance agreement, other transaction or any other type of award. No award will be made under this letter Call until funds are available. The Government reserves the right to cancel this solicitation, either before or after the closing date. The Government has no obligation to reimburse an offeror for any costs associated with responding to this Call.