

SOCOM234-004: Out-of-Band GNSS Tracker

ADDITIONAL INFORMATION

N/A

TECHNOLOGY AREAS:

Electronics | Information Systems | Sensors

MODERNIZATION PRIORITIES:

Advanced Computing and Software | Human-Machine Interfaces | Microelectronics

KEYWORDS:

counter unmanned aerial system; counter unmanned aircraft system; counter uncrewed aerial system; counter uncrewed aircraft system; unmanned aerial system; unmanned aircraft system; uncrewed aerial system; uncrewed aircraft system; unmanned air vehicles; uncrewed air vehicle; GNSS; track; tracker; tracking; real time; geolocation; drones; situational awareness; aerial systems; aerial vehicles; autonomous vehicles

OBJECTIVE:

The objective of this topic is to develop applied research toward an innovative capability to conduct the research, development, and assessment of a Global Navigation Satellite System (GNSS) based tracking system that consists of a transmitter attached to a target that broadcasts its location to a ground-based receiver. Even though this technology currently exists and is available commercially there is a need to develop a government specific version that transmits on currently unsupported frequencies.

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click the tab for “DoD SBIR 23.4 Annual”. Once there, go to “SOCOM SBIR 23.4 – Release 4”.

DESCRIPTION:

The primary use case is to mount the transmitter on a small Unmanned Aerial System (UAS) (group 1-3) to provide time, space, position information (TSPI) truth data, real time, to a ground-based receiver. An important feature of the requested system, that sets it apart from commercially available systems, is the ability to transmit on currently unsupported frequencies or the ability to adjust the transmitter frequency. Other important design considerations include size, weight, power, and cost (SWaP-C), transmitter battery life, and transmitter range. As a part of this feasibility study, the proposers shall propose system designs based on the following minimum key system attributes:

- Transmitter to broadcast GNSS based location messages to a ground based receiver.
- Weight: Transmitter less than 200 grams inclusive of antenna. Receiver less than 5 pounds.
- Obtain location data using any combination of GNSS L1 constellations (i.e. Global Positioning System (GPS), Globalnaya Navigazionnaya Sputnikovaya Sistema (GLONASS), BeiDou, and Galileo).
- Range of more than 20kilometers
- Transmitter to operate in Ultra High Frequency band.
- The receiver shall output location data to another device in real time via a wired or wireless connection using non-proprietary connectors/cables or protocols.
- Present output location via cable with latitude/longitude Decimal Degrees format.

PHASE I:

Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled “Objective” and “Description.”

The objective of this USSOCOM Phase I Small Business Innovation Research (SBIR) effort is to conduct and document the results of a thorough feasibility study (“Technology Readiness Level 3”) to investigate what is in the

art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II:

Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on an Out-of-Band GNSS Tracker.

PHASE III DUAL USE APPLICATIONS:

This system could be used in a broad range of military applications where real time tracking is required. Specific use cases include Test and Evaluation (T&E) of Counter UAS systems; T&E of blue force UAS; and any application that can benefit from real time tracking outside of typical frequencies and potential interferers.

REFERENCES:

1. "A GNSS-GSM Integrated Location Tracking System", Research Gate - Feb 2014
https://www.researchgate.net/profile/Anindya-Bose-4/publication/260157882_A_GNSS-GSM_Integrated_Location_Tracking_System/links/0f31752fcb649a5c5f000000/A-GNSS-GSM-Integrated-Location-Tracking-System.pdf
2. GSM_Integrated_Location_Tracking_System/links/0f31752fcb649a5c5f000000/A-GNSS-GSM-Integrated-Location-Tracking-System.pdf

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