

WHO

SYSCOM: NAVAIR

Sponsoring Program: NAE Chief Technology Office

Transition Target: PEO(U&W) Navy unmanned aerial platforms (Group 1 – 3)

Other Transition Opportunities: Navy unmanned surface vehicles, loitering munitions, air launched decoys, aerial targets

Notes: Artist's rendition of Gremlins program showing air launched drone swarm.
SwarmMATE is SoarTech's 4th generation swarm framework grounded in over 20 years of advanced research and hundreds of hours of live experimentation by experts in swarming systems and military tactics.
UxS: Unmanned Vehicle Systems (Air, Ground, Surface, Undersea)



<https://www.darpa.mil/program/gremlins>

WHAT

Operational Need and Improvement: Current UxS require one or more operators to control each vehicle and reliable communications limiting the number and range of operations. SwarmMATE reverses that ratio allowing a single operator to control many drone with the intelligence to make tactical decisions in response to threats in denied environments.

Specifications Required: Satisfy operator objectives and rules of engagement without further operator involvement. Coordinate heterogenous teams of two to thirty UxS with varying payloads to respond to maneuvers and threats from as many as fifty adversaries. Operate in GPS and communications denied environments. Quickly and accurately geo-locate and identify emitters using passive RF sensors with limited communications between the UxS.

Technology Developed: SwarmMATE® is a transformative software capability that brings new levels of intelligence, autonomy, and performance to unmanned systems (UxS) teams. Its onboard intelligence makes tactical decisions, coordinates team behaviors, adapts to threats and attrition to meet mission objectives. It includes a range of missions from surveillance and patrol, to search, target localization and tracking, and coordinated strike.

Warfighter Value: SwarmMATE enables a single operator to manage or control tens to hundreds of UxS to overwhelm enemy defenses providing intelligence and delivering pinpoint effects deep in denied territory with remarkable efficiency and effectiveness. By swarming numerous, geographically dispersed UxS that can adapt their plans in milliseconds, SwarmMATE is able to overwhelm enemy defenses providing intelligence and delivering pinpoint effects deep in denied territory with remarkable efficiency and effectiveness.

WHEN

Contract Number: N68335-21-C-0510

Ending on: Nov 30, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Initial prototype RF localization swarm behavior	N/A	Software complete, tested in simulation	4	4th QTR FY20
Prototype SW with all Sensors	Low	Software complete, tested in simulation	5	1st QTR FY23
Flight Test	Medium	Flight test complete, metrics attained	6	4th QTR FY23

HOW

Projected Business Model: SoarTech operates on the product enabled services business model. We are developers of innovative artificial intelligence software technologies to enhance the capabilities of autonomous systems. We partner with systems integrators and DoD prime contractors to integrate our software with a military platform or system. SoarTech uses both a licensing and support services contracting model in working with our partners.

Company Objectives: Our goal for SwarmMATE is to build an innovative product and transition it into government programs and commercial systems. While we continue to pursue R&D contracts we are looking to develop relationships with companies developing unmanned vehicle systems for military or commercial markets who are interested in adding higher levels of intelligence and coordination to their systems.

Potential Commercial Applications: SwarmMATE has mission support for air and ground vehicle but can be applied to surface and underwater domains as well. Commercial applications include search and rescue, disaster relief, wildfire mapping/monitoring, facility security, and wildlife management.