

Case Study

Blue Bear

The logo for Blue Bear Systems Research Ltd, featuring the company name in a blue sans-serif font and a stylized black arrowhead pointing to the right.

UK first for Drone swarms

Idea

Blue Bear Systems Research Ltd has now moved into the final stages of development of a new system architecture that will enable effective command, control and information management of a swarm of 20+ unmanned air vehicles (UAVs) operating as a collaborative team. The system which has successfully proved its proof-of-concept through two phases of Defence trials will, at the end of Phase 3 demonstrate its effectiveness for Defence use, being able to interoperate in complex and contested environments.

The work integrates and evaluates key next-generation components and technologies that Blue Bear and its partners have successfully developed and de-risked within a number of MOD programmes. Blue Bear has worked closely with the Defence Science and Technology Laboratory (Dstl) in the delivery of integrated systems that will contribute to a new military capability. The Defence and Security Accelerator (DASA) has enabled Phase 3 development through its open competition framework.

Unmanned Air Systems (UAS) are currently in widespread use around the world, but the ability to employ a swarm of these systems to operate collaboratively to achieve a common goal will be a new benefit to UK Defence. A swarm has the potential to lower operating costs, provide greater system efficiency, as well as increase resilience in the following areas:

- Situational awareness
- Medical assistance
- Logistics resupply
- Explosive ordinance detection and disposal
- Confusion and deception

Blue Bear specialises in unmanned Air, Land and Maritime systems. Blue Bear designs, builds and tests bespoke drones for the Military and Civil sectors.

The Defence Minister said:

“Drone swarm technology can revolutionise how we conduct intelligence gathering, humanitarian aid, disposal of explosives and supply our troops on the battlefield.”

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Defence and Security
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Implementation

The Defence and Security Accelerator (DASA) awarded defence funding of £2.5m to Blue Bear in January 2019 to lead a consortium to develop the next generation of drone swarm technology. The 'Many Drones Make Light Work' Phase 3 is the largest single contract awarded by DASA and the first themed competition to reach Phase 3 to date. The funding will steer the project for around 20+ unmanned aerial systems (UAS) into the final stage of development, which is managed by the Defence Science and Technology Laboratory (Dstl).



Blue Bear is the consortia lead and system integrator, with IQHQ, Plextex, Airbus and the University of Durham as part of the contracted team. Each organisation brings a crucial technology and skill set to the team in this 18-month Integrated Concept Evaluation phase which will culminate in live flight demonstrations to the military customer.

Impact

The UK Armed Forces are actively seeking robotic solutions to provide a 'Force-Multiplier' effect whereby a greater military capability is delivered by fewer people and equipment. The swarm system is one possible solution to providing this effect as it will cover larger areas of battlespace more quickly at lower cost and reduce man hours. It also removes the operator from potentially harmful situations.

Currently, operational systems require one or more operators to pilot the aircraft or to closely manage the flight mission. This is manpower intensive and consumes time and resource to train operators. Phase 3 will seek to establish a more 'self-sufficient' UAS swarm, providing the military with the ability to operate in increasingly complex and contested environments. Effective Human Machine Teaming will remain at the core of this research to ensure that a human remains firmly in control of the system.

Once the technology is de-risked and the operational use is established in one domain (e.g. Air), the core technology can be read across to the Land, Sea and Space domains. The underlying principle could also be adapted to many human intensive Security applications.

The market demand for a much broader range of applications already exists for solutions to border control, surveillance of illicit goods trafficking over land and sea, anti-piracy, search and rescue missions, monitoring refugee movements and much more. Approximately 98% of the Blue Bear system concept is a UK sovereign capability which provides excellent export opportunities for UK prosperity.



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