

EDF-funded project OPERANT addresses modern challenges in battlefield situational awareness.

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Recent events have underscored the critical need for enhanced national and collective defense capabilities across the EU and NATO. While advancements in military technology continue to progress, recruitment rates within Western armed forces are declining, necessitating a shift toward automation and digitalization to reduce personnel requirements. European armies and EU institutions have increasingly prioritized the development of agile, stealthy, modular, and multifunctional ground combat capabilities to support multi-domain operations.

Among these efforts, the development of integrated persistent intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) systems has emerged as a cornerstone for improving situational awareness in complex, multi-domain environments. Battlefield tactical information sharing and manned-unmanned teaming are critical enablers for modern military strategies.

To address these challenges, the OPERANT project offers an innovative solution to acquire situational awareness of deep adversary terrain without jeopardizing human life. The project focuses on the digitalization of the “last mile,” deploying sensors and effectors deeply into adversary-dominated territory while ensuring secure and robust communication of data to Allied command centers in real-time.

The OPERANT system is designed as a cost-efficient, highly endurance-capable, unattended platform deployable via rocket technology. It consists of a distributed mast-based sensing network capable of gathering situational awareness through the cooperative use of sensors deployed across an area of interest. The modular design of the system allows it to be tailored to specific mission requirements, whether for basic detection tasks or more complex operations such as “identification, friend or foe” (IFF), supported by machine learning and human operator assistance.

Key features of the OPERANT system include:

1. A mast system with a modular design to integrate various sensors and effectors, functioning as an antenna for long-line-of-sight (LOS) communication with Allied control stations.
2. Trainable PTU (Pan-tilt Unit) camera and LRF (Laser Range Finder) payloads for identification activities.

3. Acoustic sensors to enhance distributed sensing capabilities.

4. A mast-based secure and robust communication system ensuring interoperability.

5. A rocket launcher enabling covert and rapid deployment of the system.

6. On-site data signal processing to reduce communication load and ensure efficient data transmission.

OPERANT will provide an “eye and ear” on the battlefield, enabling real-time situational awareness and supporting decision-making processes with unparalleled accuracy.

The OPERANT project is a 3-year initiative funded by the European Defense Fund (EDF) with a total budget of nearly € 4 million. It involves an international consortium of six partners from four countries:

- ZIPPERMAST GmbH (Coordinator, Germany)
- Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. (Germany)
- Microflown Avisa BV (Netherlands)
- T-Minus Engineering BV (Netherlands)
- Technikon Forschungs- und Planungsgesellschaft mbH (Austria)
- Unmanned Technologies Applications SL (Spain)

The project is set to commence in May 2025 and aims to deliver a cutting-edge system that enhances situational awareness in high-stakes environments while safeguarding the lives of personnel.

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