Advanced Low Flying aircrafts detection and tracking

Project reference: 700002 Project website: www.alfa-h2020.eu Project start: 1st January, 2017 Project duration: 3 years Total costs: EUR 4.613.831,25 EC contribution: EUR 4.613.831,25



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Mission of ALFA:

ALFA will bridge the existing capability gap of current operational surveillance systems for border control with respect to detection, classification and identification of LSS (Low, Small and Slow) manned and unmanned flying vehicles. ALFA is future-ready as technologies for drone detection will be a part of the system, which will use heterogeneous, easy-to-deploy mobile sensors based on several novel technologies. The ALFA system will make a significant contribution to the development of EURO-SUR (in particular, cooperating with SIVE and SIVICC) and be suitable for a range of other missions and scenarios such as homeland and event protection and the protection of critical infrastructure.

Motivation:

The last decades witnessed the ever growing effectiveness of Europe-subsidized border protection projects like SIVE and SIVICC. As maritime smuggling from Morocco towards the European borders of Portugal and Spain was combated more effectively, the criminal modus operandi changed drastically, approaching air routes with cheap and small planes. In addition, new drone technology opens the opportunity to both manned and unmanned airborne drug transports. Launched from any location and moving at low altitude and speed to mask their presence with the present clutter environment, drones can autonomously reach any landing site while remaining undetected under nearly all circumstances. It is anticipated that this success will lead to a broader use of these upcoming smuggling methods.

Objectives:

The main objective of the project is the development of a system for timely detection, classification and understanding of the intentions of suspected air targets. The system will also provide a prediction of the landing site or dropping zone. ALFA will contribute to the following EU strategic goals:

- Increasing the EU internal security by the reduction of cross border crime
- The interdiction of drug trafficking
- Assistance in the prosecution of drug trafficking criminals
- The confiscation of drugs and aircraft
- The interdiction of weapon and illicit substance trafficking

Expected impact:

Border security is obviously a critical topic for all EU Member states, especially for those countries with external land and maritime borders. The ALFA project is expected to increase surveillance capabilities contributing to the prevention of cross border crimes, in particular in terms of reduction of the traffic of drugs, weapons and illicit substances, focusing on the improvement of the skills for combating drug smugglers that exploit a new modus operandi for crossing borders undetected using small low flying aircraft loaded with drugs. This situation is a global issue, but it has been identified as a major gap to combat drug smuggling entering through the south coast of Spain and Portugal. According to the intended objectives, the impact of ALFA project will be measured in accordance to its ability to:

- contribute further to the development of EUROSUR and
- complement existing surveillance tools and strategies,
- **be adaptable** (the system itself and the developed technologies) in other missions/area of interest.





Technical Approach:

ALFA is planned to run for 36 months. It is organized into eight work packages (WPs) with significant dependencies and expected synergies between them which are described shortly in the following:

WP1: System specifications and operation concept

This work package is a foundation point for ALFA execution. It will define the end user requirements as well as existing technology gaps. The main objective is to detail the operational gap in detection of small smugglers' aircraft entering European borders, identifying operational requirements and potential future menaces.

WP2: System architecture

WP2 will define a maritime border surveillance system architecture optimized for the detection of small, low flying aircraft of different types including small aircraft, helicopters and drones.

WP3: Components and technologies

The overall objective of this work package is to achieve the necessary development for detection capabilities beyond state of the art according to findings of WP1. Detection, classification and identification will be brought up to a level needed for successful data fusion and Situational Awareness of WP4. To complement the radar localization capabilities, the feasibility of radiolocation and passive radar will be shown.

WP4: Situation assessment and landing site prediction

WP4 defines and develops functions for threat assessment and the build-up of situational awareness through the use of sensor information, for the calculation of the optimal observation position of ALFA assets, for the prediction of landing zones and for the presentation layer of ALFA.

WP5: System integration and testing

This WP focuses on the implementation and integration of complete sensor and computing suite and preliminary testing. The suite contains radar, electro-optical sensors passive RF receivers, etc. from WP3 and WP4.

WP6: Functional Demonstration

WP6 will address a demonstration of the fully functional ALFA system to EU, end users, relevant industries and other relevant parties.

WP7: Dissemination, Exploitation and Ethical aspects

This WP obtains input from other WPs focusing on scientific research and ensures the communication and dissemination of results achieved within the single WPs to the outside parties as well as to participating entities. WP7 will further support the partners to exploit the achieved results and impact the European and international market. The ethical and societal impact of the project will be closely monitored and reported on.

WP8: Project, Risk and Innovation management

WP8 monitors and guides other WPs in order to ensure a successful project execution with respect to risk- and innovation management. The management WP shows dependencies to all other WPs as it coordinates and ensures that the tasks are in line with the project work plan in order to reach the common goal of ALFA.



Contacts:

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Consortium:

The consortium of the ALFA project brings together a European team of recognized organizations from various backgrounds, making it well-positioned to achieve its objectives. All in all there are 9 partners from 6 different European countries (Austria, The Netherlands, Portugal, Italy, Spain, Germany) including 3 industrial partners, 1 SME, 1 university, 2 research institutions and 2 government agencies.

Project Partners:

Madrid, Spain



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Braunschweig,

Braunschweig, Germany

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GNR

Ministerio da Administracao Interna (Ministry of Internal Affairs) - Guarda Nacional Republicana, Lisbon, Portugal

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Ministerio del Interior -Dirección General de la Guardia Civil, Madrid, Spain



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