



European Commission

# Towards a European Defence Union

2019 PREPARATORY ACTION ON DEFENCE RESEARCH (PADR) CALLS - DESCRIPTION OF SELECTED PROPOSALS

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## CROWN

**European Active electronically scanned Array with Combined Radar, Communications, and Electronic Warfare functions for military applications: CROWN**

will design, develop and test a compact, lightweight multi-function radiofrequency system prototype integrating radar, electronic warfare and communication in one single system, without any end-user restrictions. Possessing this technology is key for knowing how and why the electromagnetic spectrum is used in a combat, ensuring that our military can use it as they need it and deny it to adversaries.



## AIDED

**Artificial Intelligence for Detection of Explosive Devices** - is about Artificial Intelligence

for the detection of explosive devices. The armed conflicts in Afghanistan, Iraq or Syria have seen a dramatic rise in the use of Improvised Explosive Devices (IEDs) and landmines by adversaries. In operations in those countries, 50% of soldier deaths in action are directly related to IEDs. AIDED will use a set of state of the art Artificial Intelligence (AI) algorithms able to identify unconventional (IEDs) and conventional (buried mines) explosive devices, and autonomously plan offline and run-time missions plans. It will also provide positioning, navigation and mapping to control a fleet of robots that cooperate quickly to identify a safe passage in a high-risk area.



## QUANTAQUEST

**Quantum Secure Communication and Navigation for European Defence:** In the future, quantum radars will make stealth aircrafts obsolete, quantum superconducting magnetometers will detect submarines and quantum computer cryptanalysis will break conventional codes. The project will develop quantum sensing for navigation and timing without relying on Global Navigation Satellite Systems and quantum communication to secure Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR).



## PILUM

### **Projectiles for Increased Long-range effects Using Electro-Magnetic railgun:**

Considering trends for enhanced precision and range of ammunition while seeking affordable costs, the electromagnetic railgun (EMRG) is a disruptive technology to launch projectiles over extremely long distance (more than 200 km) and a potential operational game-changer, thanks to electromagnetic acceleration instead of chemical propellants. The project lays the foundation for achieving a full-scale demonstrator by 2028.



## OPTIMISE

**Innovative Positioning system for defence in GNSS-denied areas** - is about autonomous positioning, navigation and timing and proposes a novel architecture to fuse data from different sensors and signals. The project should improve positioning, navigation and timing in areas without access to Global Navigation Satellite Systems (GNSS).



## ARTUS

### **Autonomous Rough-terrain Transport UGV Swarm**

- will demonstrate the feasibility of an intelligent small swarm of (3 to 12) Unmanned Ground Vehicles (UGV) that will closely follow a platoon in various terrains. It will be capable to dynamically react to changing mission scenarios on its path. The swarm greatly changes the soldiers' capacity as it carries major logistical supply of the troops, including nutrition, ammunition and special gear, through harsh environments, including densely wooded or sloped areas. The swarm of UGVs could also carry wounded soldiers.



## INTERACT

### **Interoperability Standards for Unmanned Armed Forces Systems**

- aims to create a basis for a future European interoperability standard for military unmanned systems. The technical knowledge and operational experience available in Europe on control, monitoring, and application of unmanned systems will be integrated for the concept definition of a future European cross-industry interoperability standard. This standard will allow unmanned assets to be deployed flexibly in different configurations, such as singular deployment, in manned-unmanned teaming or as autonomous swarms independent of organizational or national provenance.