

PRESS RELEASE

LEONARDO AND BAYKAR SET MAJOR MILESTONE FOR ADVANCED CREWED/UNCREWED CAPABILITY DEVELOPMENT WITH SUCCESSFUL FIRST K-SWARM LIVE TRIALS

- **Leonardo M-346 airplanes and Bayraktar KIZILELMA unmanned fighter aircraft have successfully performed a series of joint autonomous formation flights as part of the K-SWARM programme.**
- **The live trials assessed and validated collaborative and coordinated operations through advanced, next-generation algorithms.**
- **The transition from simulation to live operation, leveraging a digital engineering approach, marked a pivotal step in demonstrating the programme's advanced solutions and technologies.**
- **The capabilities demonstrated in the trials represent an essential enabler for future combat air systems, and are a core pillar in the evolution of current generation fighters.**

Leonardo and Baykar set a major milestone in the development of Crewed/UnCrewed Teaming (CUC-T) and swarm tactics capabilities, after successfully completing the first phase of live testing activities for the K-SWARM programme. The programme is aimed at designing and developing interoperability between crewed and uncrewed aircraft.

Collaborative combat teaming has increasingly become a key enabler of future combat air systems, and part of the evolution of current generation fighters. Today's design of Crewed/UnCrewed Teaming (CUC-T) is one of the fundamental strands for the transformation of military and security tools in all domains. Its' importance is not only technological, but also operational, doctrinal and industrial. The testing was carried out in May at one of Baykar's flight and test center in Çorlu, Türkiye. The flight test campaign involved two Leonardo M-346 airplanes - a Leonardo owned M-346 Fighter Attack Variant, with an Italian Air Force's T-346A acting as chase aircraft - and the Bayraktar KIZILELMA Uncrewed Fighter Aircraft.

Testing activities consisted of a series of missions aimed at assessing latest generation algorithms as well as the relevant tactics and procedures developed by Leonardo at its Avionic, Flight Control Innovation Labs and product capability and concept laboratory, PC2LAB, in Turin, linked with an M-346 Full Mission Simulator in Venegono, Italy. In parallel, leveraging state-of-the-art software and hardware at Baykar facilities, Baykar integrated advanced smart fleet autonomy capabilities into the CUC-T algorithms. KIZILELMA's advanced autonomy capabilities greatly simplified the integration process, allowing for seamless implementation and rapid deployment.

These were brought into action during the M-346/KIZILELMA formation flights, supporting the validation of advanced collaboration and coordination of different high performance combat platforms and air systems, as the programme marked the transition from simulation to live operations.

An advanced radio frequency data exchange system allowed for the synchronization of all data shared between the M-346 and KIZILELMA platforms, protected by Leonardo GCC Tactical Platform. This proprietary cyber defence platform protects and monitors systems in real time, allowing for effective command and control of the planned flight formations.

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During the flight campaign, following an autonomous taxi and take-off, the KIZILELMA autonomously rejoined the M346 Fighter Attack using Smart Fleet Autonomy algorithms developed by the Baykar's Hardware-in-the-Loop (HIL) Laboratory, enabling the M346 to subsequently assume full control of the unmanned aircraft. Using a newly developed fully integrated onboard avionic suite, the M-346 pilots commanded different formations which were autonomously executed by KIZILELMA through a dedicated crewed/uncrewed computing system. Different maneuvers and formations, including position changes, separations and rejoins were successfully tested with the KIZILELMA accurately responding to the M-346 commands.

The activities performed in Çorlu were the result of extensive and intense preparation work, including pilots and technicians, which were jointly carried out over several months by the Leonardo and Baykar teams. This extensive work resulted in the trials achieving the required level of technical integration of the systems, the development of testing scenarios, the algorithms validation and ensured the tests could be managed and completed safely and effectively.

The data and analysis gathered has been crucial in defining the next steps in the K-SWARM programme, as it moves into more complex operations requiring greater situational awareness and assets working together 'as one' towards mission objectives. The refinement and maturity of "AI" technology, algorithms and collaborative procedures will enable the uncrewed systems to incrementally shift from remote piloting to autonomy, with the aim of reducing pilot workload and increasing mission efficiency while maintaining full control and decision-making. New tests are planned in the coming months, with increasing complexity and additional functions.

The first phase of trials demonstrates the solid partnership between Leonardo and Baykar, and their respective technology and industrial competences. It confirms the companies' competitive advantage in the field and represents a concrete step towards the development of critical capabilities for modern combat air operations in multidomain operational scenarios.

Press Contact :

Muttalip ERDOĞAN

a.erdogan@baykartech.com

0090 539 720 82 90

<https://www.baykartech.com/tr/>[@BaykarTech](https://twitter.com/BaykarTech)[Baykar Technologies](https://www.linkedin.com/company/baykar-technologies)[Baykar](https://www.facebook.com/Baykar)[baykartech](https://www.instagram.com/baykartech)

Leonardo Press Office

PH: +39 06 32473313

leonardopressoffice@leonardo.com**leonardo.com**