

PRESS RELEASE

SENER Aeroespacial and Aerdrón collaborate to develop a drone designed to fly on Mars

Madrid (Spain), March 23, 2022 - The European Space Agency (ESA) awarded [SENER Aeroespacial](#) the AERIAL project to design an unmanned aerial vehicle or drone capable of flying in the low density, pressure and temperature of the Martian atmosphere. AERIAL is the European proposal to conquer the Martian skies by increasing and improving the capabilities of classic ground exploration vehicles (rover) and avoiding dealing with the complicated terrain they face in their quest to search for scientific data.

SENER Aeroespacial is the company responsible for spearheading the project, in concert with [AERDRON](#). SENER Aeroespacial has extensive experience in the design, integration and validation of space systems, including on-board electronics, navigation and control algorithms, communications systems, optical equipment and robotic actuators (mechatronics). It also has experts in fluid dynamics to design the aerodynamic profiles of the Martian blades. SENER Aeroespacial has already taken part in the development of Martian vehicles, such as the [Perseverance rover](#) for NASA's Mars2020 mission, currently operating on the Martian surface, and the [Curiosity rover](#) for NASA's MSL mission, and it has also contributed technology to ESA's ExoMars 2016 and 2022 missions. For its part, AERDRON, a Spanish company involved in the design and manufacture of unmanned aerial vehicles, will develop a drone prototype with six-propellers with a maximum take-off weight of five kilos that will be capable of flying in an environment that reproduces the complex thermal and pressure conditions of Mars.

Guillermo Rodríguez, AERIAL Project Manager at SENER Aeroespacial, says that "AERIAL is a very ambitious project within the framework of European collaboration for the European Space Agency, one that will enhance the technologies and knowledge of the Spanish space industry, driving it towards new limits. This project will serve to demonstrate our industry's ability to develop highly sophisticated devices that are capable of flying in the atmosphere of another planet."

Marcos Alazraki Benveniste, President of AERDRON, noted that "drones will play a very important role in the future of space exploration, since they can reach places, such as Martian volcanoes, that rovers cannot. Drones could also be used to prospect for water and minerals, as well as to fabricate infrastructures in space."

Flying on Mars using rotary wings poses a technological challenge due to the harsh environmental conditions: very light atmosphere with a density 100 times lower than Earth's, extreme temperatures with swings of 70 degrees or more, and radiation seven hundred times higher than on Earth. The biggest technological challenges will be generating enough thrust to lift the 5-kg mass, while minimizing the heat generated by the propulsion system and developing an autonomous navigation system that does not rely on GPS, which is not present on our neighboring planet.

The drone will be designed to take off from a platform on the rover, fly around to a range of one kilometer and land back on the same platform. The rover would swap out and charge the battery.

The tests will be done at the Mars Simulation Laboratory in Denmark, whose atmospheric chamber has been especially designed to simulate the environmental conditions and dusty surface of Mars.

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This project is in keeping with ESA's long history of developing Mars missions (such as Mars Express 2003 and Exodus 2016 and 2022) and applications for planetary exploration.

About SENER Aeroespacial

SENER Aeroespacial has been a leading supplier of high performance aerospace systems for Space, Defense and Science for more than 50 years, with high added value technological developments.

In Space, it supplies electromechanical components and systems, navigation systems (GNC/AOCS), communications, astronomy and optics systems, and it is currently participating in the main programs of ESA and NASA (including Euclid, Meteosat Third Generation, Solar Orbiter, JUICE, Proba-3, Hubble, Galileo, Rosetta, Gaia, Herschel and Planck, IXV, BepiColombo and Mars 2020) and the European Southern Observatory; in the Space commercial market, is a leading supplier of telemetry and telecommand antennas and a regular supplier of all types of antennas, passive equipment and radio frequency assets for the leading international manufacturers of communications satellites, even in programs for the so called New Space.

SENER Aeroespacial is part of the SENER engineering and technology group, founded in 1956. The SENER Group has 2,350 professionals in offices in five continents and works in the Aerospace, Infrastructure, Energy and Marine sectors.

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About AERDRON

AERDRON is a Spanish company that specializes in designing innovative bespoke unmanned aerial vehicles and aerospace products from a conceptual stage to a fully engineered product. Our clients and projects range from Tier 1 aerospace companies seeking to build one of a kind air vehicles to European funded R&D projects. The founders of AERDRON have over 20 years of experience working on cutting edge experimental aviation and space projects in the USA and Europe.

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