

PRESS RELEASE

SENER and UC3M develop technology to alleviate the problem of space junk

Madrid (Spain), September 23, 2019 - The [SENER](#) engineering and technology group and the Carlos III University in Madrid (UC3M) collaborate on a new technological development, this time as part of a joint effort to combat a growing problem: the space junk in orbit around the Earth.

As part of [E.T. PACK](#), a FET-OPEN project financed with €3 million from the European Commission, the two institutions are collaborating in order to develop and validate a satellite de-orbiting system, based on a space tether, that would take the satellite out of orbit once it is no longer in use. Rounding out the project consortium are the universities of Padua (Italy) and Dresden (Germany), the Fraunhofer Institute (Germany) and the Spanish company Advanced Thermal Devices.

It is a small, autonomous de-orbiting kit that will be installed on next-generation satellites. Once activated from the ground, the kit will deploy a space tether that passively interacts with the Earth's magnetosphere, causing the satellite to brake until it reenters the Earth's atmosphere, where it will disintegrate. The space tether, a very thin aluminum strip some two centimeters wide and a couple of kilometers long, takes advantage of the plasma that is present around the Earth and the geomagnetic field to generate an electric current that, thanks to an electrodynamic effect, results in a force known as Lorentz braking. This force de-orbits the satellite and causes it to re-enter the atmosphere, thus contributing to the sustainable use of space.

In the past, different systems have been researched for de-orbiting satellites, such as conventional propulsion, electric propulsion and sails, but none have been adopted to date due to their high cost. As a result, no country is forcing space companies to clean up their junk. The system proposed by E.T.PACK seeks to reverse this trend by providing a lightweight, low-cost system. The de-orbiting kit can communicate with the ground, stabilize a satellite of up to 1000 kg, deploy the space tether and control the de-orbiting maneuver to prevent collisions with other objects.

SENER and the UC3M have a successful history of collaborations, including the [helicon plasma thruster](#) for space propulsion, the development of photon technologies, a CubeSat demonstration mission and other innovations for the space industry.

SENER Aeroespacial has been a leading supplier of high performance aerospace systems for Space, Defence 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 for Space, 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 Space 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. In Defence, it develops electromechanical systems, COMINT (communications intelligence) and communications links (D-Link), as well as helicopter modernization services. In Astronomy and Science, it produces precision mechanical equipment for terrestrial telescopes and

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engineering services. And, finally, its ATC & Broadcast division is a supplier of antennas and passive units.

About SENER

SENER is a private engineering and technology business group founded in 1956. Its aim is to offer its clients the most advanced technological solutions and to achieve international recognition based on its independence and commitment to innovation and quality. SENER has 2,300 professionals across its centres in Algeria, Argentina, Brazil, South Korea, Canada, Colombia, Chile, China, the United Arab Emirates, Spain, the United States, Morocco, Mexico, Poland, Portugal, the United Kingdom and South Africa. The group's operating revenue exceeded 589 million Euros (2018 data).

SENER brings together its own Aerospace and Engineering activities with industrial holdings in companies working in the field of Energy through SENER Renewable Investments. SENER Aerospace has more than 50 years of experience and it is a first-rate international supplier in Space, Defense and Aeronautics. SENER Engineering has become a leading company worldwide in Infrastructure, Energy and Marine.

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