

## The big Space spring clean

***The European Conference on Space Debris recently highlighted an urgent need to start removing redundant objects out of orbit. Unless items are eliminated, collisions will be inevitable and space will become extremely hazardous. maxon motor uk has been working with the Surrey Space Centre (SSC) on their experimental solution.***

To combat the problem of the increasing density of debris in low Earth orbit (LEO), the Inter-Agency Space Debris Co-ordination Committee (IADC), the United Nations and other agencies have recommended the implementation of a set of guidelines by which it should be demonstrated that all launch vehicles and satellites will not remain in LEO for more than 25 years beyond the end of their service lives. Drag deorbiting sails are one of two main competing technologies likely to emerge as the tools used to meet these guidelines.

The Surrey Space Centre's (SSC) drag deorbiting sail project, Inflatesail, contains two experimental structural components. The first is an inflatable rigidisable mast and the second is an ultra-

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driven by precision

lightweight polymer sail. The sail is supported by four custom manufactured ‘bistable’ carbon fibre booms which are wound around a central hub. maxon motor GP 16C planetary gearheads, combined with 16mm brushless DC motors from the maxon EC-max family, are used to drive and control the deployment of the booms. The ceramic components are wear and corrosion resistant for longer life and enable stability over a wide range of temperatures. The brushless DC motor and gearhead are fitted with high performance Braycote grease, which is non-flammable, suitable for extreme temperatures, is chemically inert and designed to be used in a deep space vacuum.

Dr Andrew Viquerat, Research Fellow at the SCC said ,We have worked with maxon for a number of years, and continue to do so because of the reliability of the products. Some of our requirements are slightly unusual, and the people at maxon have been helpful and interested in helping us address them. In particular, we require DC motors which work in vacuum and at high temperatures.’

Greg Dutfield, Senior Sales Engineer at maxon motor UK said ,The Surrey Space Centre provides us with exciting projects to work on. Space is a challenging environment, and we are fortunate to have had a lot of experience in this area having been onboard the Mars rovers when they were first launched ‘.

The Surrey Space Centre is a world-class institution for space research, primarily a research and teaching institution, the SSC also commercialises new and innovative technology stemming from their research.

InflateSail is part of a larger European Commission project called DeployTech (more on this project here <http://deploytech.eu/>). The InflateSail experiment will be launched next year as part of the QB50 project: <https://www.qb50.eu/>. A successful test could lead to a commercial device for removing satellites from low Earth orbit.

### **About maxon motor**

maxon motor is the world’s leading supplier of dc motors, brushless motors, gearheads and controllers. We offer high quality, innovation, competitive pricing and highly specialised solutions.

Where are maxon motors used today?

Aerospace  
Robotics  
Medical science  
Industrial automation  
Instrumentation & inspection  
Communication  
Surveillance cameras  
Automotive  
Consumer applications

maxon’s motors, gearheads, encoders, brakes and controllers are all perfectly compatible and offer an almost unending number of possible combinations. The maxon modular system gives the ideal combination for the required application.

### **For additional information, contact:**

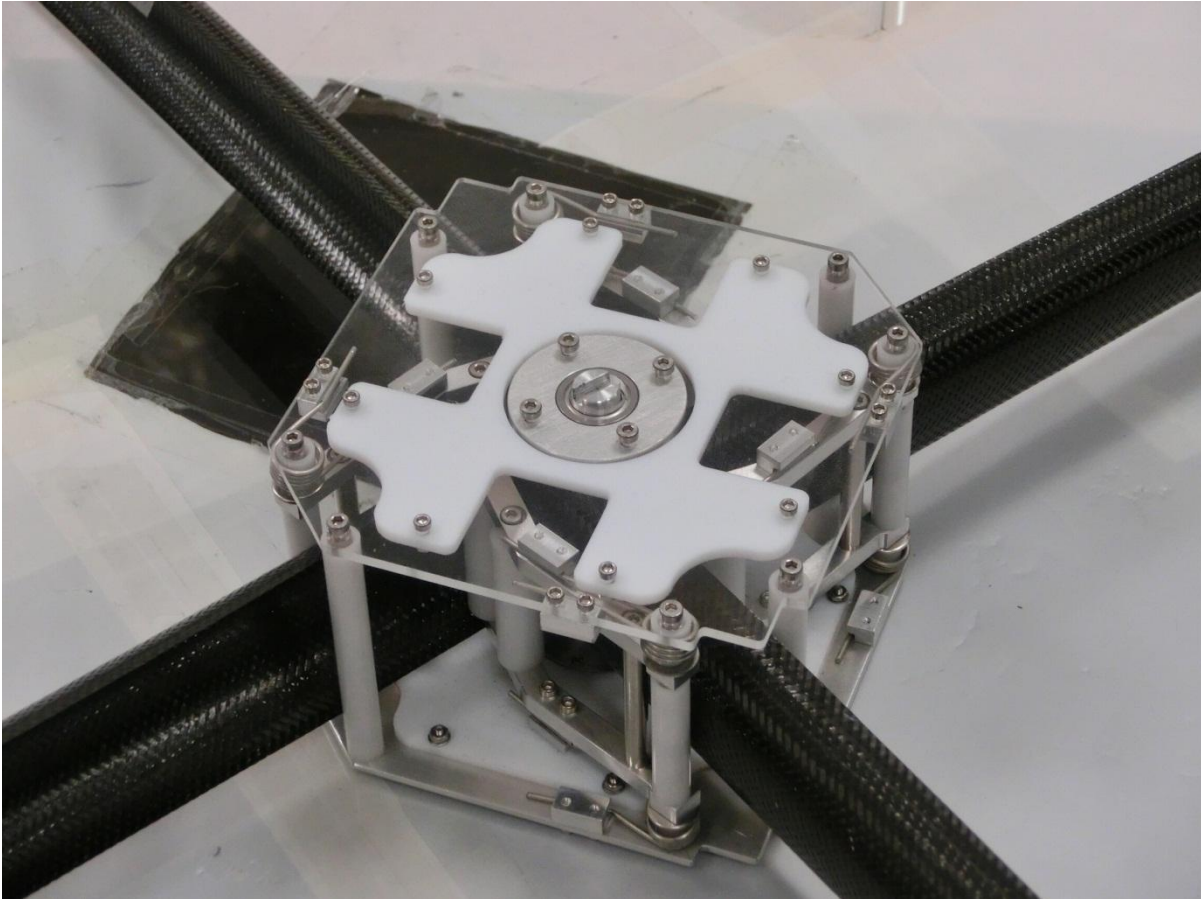
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A prototype of a 'deployer' for the sail support booms. The motor sits in a shaft underneath the deployer, and is used to wind the carbon fibre booms in and out.