

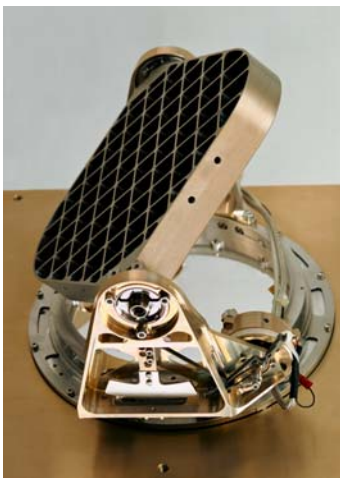
Spaceborne Mechanisms



Sula has an exceptionally strong background in space mechanisms. The members of the Sula mechanism design team were originally at the MMS/BAe Space Systems site in Bristol, where they developed an international reputation for the design and delivery of high performance bespoke space mechanisms under the leadership of Martin Humphries. Over the last six years Sula has been responsible for the concept and detail design of a wide range of challenging space mechanisms for a number of international companies.

Overview of Achievements

Sula's team has world-leading capabilities in the design and development of novel precision mechanisms and actuators for demanding applications. We work extensively with partners and customers, taking responsibility for leading key technical design activities at all phases including bid preparation, initial and detailed design, manufacturing, commissioning and test, and performance verification.



CPA Inter-satellite Laser Link Mechanism (courtesy Contraves Space)

Key responsibilities of the Sula team have included:

- **Prime level consultant, for all ENVISAT mechanism equipments**
- **Re-definition of ASAR deployment system**
- **The MHSA solar array deployment system**
- **The primary deployment system for ENVISAT solar array**
- **The MIMR scanning and active balance control system**
- **GOMOS mirror steering mechanism including AATSR, MTS and AMSU-B**
- **ROSETTA mechanisms concept design (including APM and SADM)**
- **The HIRDLS tracking sun shield and aperture cover**
- **Consultant to RAL for the LISA Inertial Sensor Caging Mechanism**
- **Development of a low cost deployable boom for SSTL.**

For more information about Sula and how we can help you, please contact us on 01453 844660 or email info@sula.co.uk

Examples of Projects

Laser Terminal Pointing Mechanism

Contraves Space have developed a laser based inter-satellite communications terminal. This equipment requires a two axes mirror pointing mechanism for laser beam steering. Sula were tasked with establishing an optimum concept and provide the mechanism design experience and innovation to enable Contraves to develop a fully functional Demonstrator within a six months schedule. This unit incorporates a range of revolutionary features and is unlike all previous pointing devices.

ASCAT Motorised Deployment Hinge

The ASCAT Wind Scatterometer comprises of three planar antenna, one fixed whilst the others unfurl to $\pm 45^\circ$ with respect to the velocity vector. Deployment on these skewed hinges is controlled at a slow and uniform rate by a motorised deployment hinge (MDH). This programme was performed in close partnership with the European Space Tribology Laboratory (ESTL), who performed the procurement, assembly, integration and test activities. The team supported KDA Aerospace from proposal submission to flight unit manufacture.

IASI Scan Mechanism

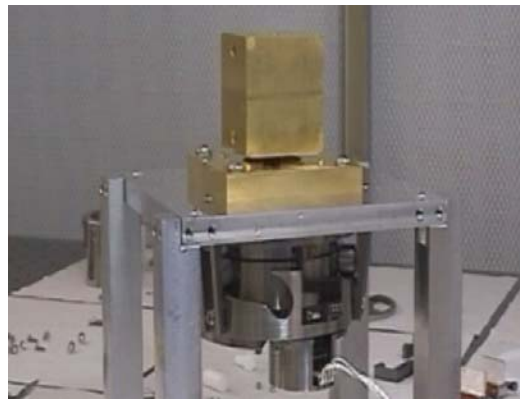
The IASI scan mechanism is a two axis agile scanning mechanism and is part of the IASI scan subsystem. For the detailed design and qualification phases of this mechanism, Sula worked on site with Contraves in a leading technical role.

Two Axis Antenna Pointing Mechanism with Multiple RF Feed-through

This was an ESTEC TRP study contract, which was awarded to KDA Aerospace. Sula supported KDA during the proposal preparation and was subsequently awarded a support contract.

LISA Inertial Sensor Caging Mechanism

Sula have worked with RAL and ESTL on an ESA programme to develop a caging mechanism for the inertial sensor to be used on the LISA programme. This device is completely new and is a unique design that must fit within the extremely constrained envelope within the sensor chamber. The purpose of the device is to constrain the instrument proof mass during launch and then release it at a precise position and with a very low residual velocity.



LISA Z-axis translation mechanism (courtesy RAL)

Low-Cost Deployable Boom for SSTL

Sula have developed a low-cost deployable boom for Surrey Satellite Technology (SSTL). The boom concept is a simple system of nested thin wall cylindrical tubes that provide an axially compact stowed configuration for launch. Once on orbit the tubes are axially deployed to form an extended tubular structure. During deployment the tubes are sequentially deployed and latched using a unique escapement latch system. The deployment mechanism concept is based on the use of a 'belt drive' system mounted within boom. The stowed length is 0.5m and the deployed length is 4m.

For more information about Sula and how we can help you, please contact us on 01453 844660 or email info@sula.co.uk

Sula >