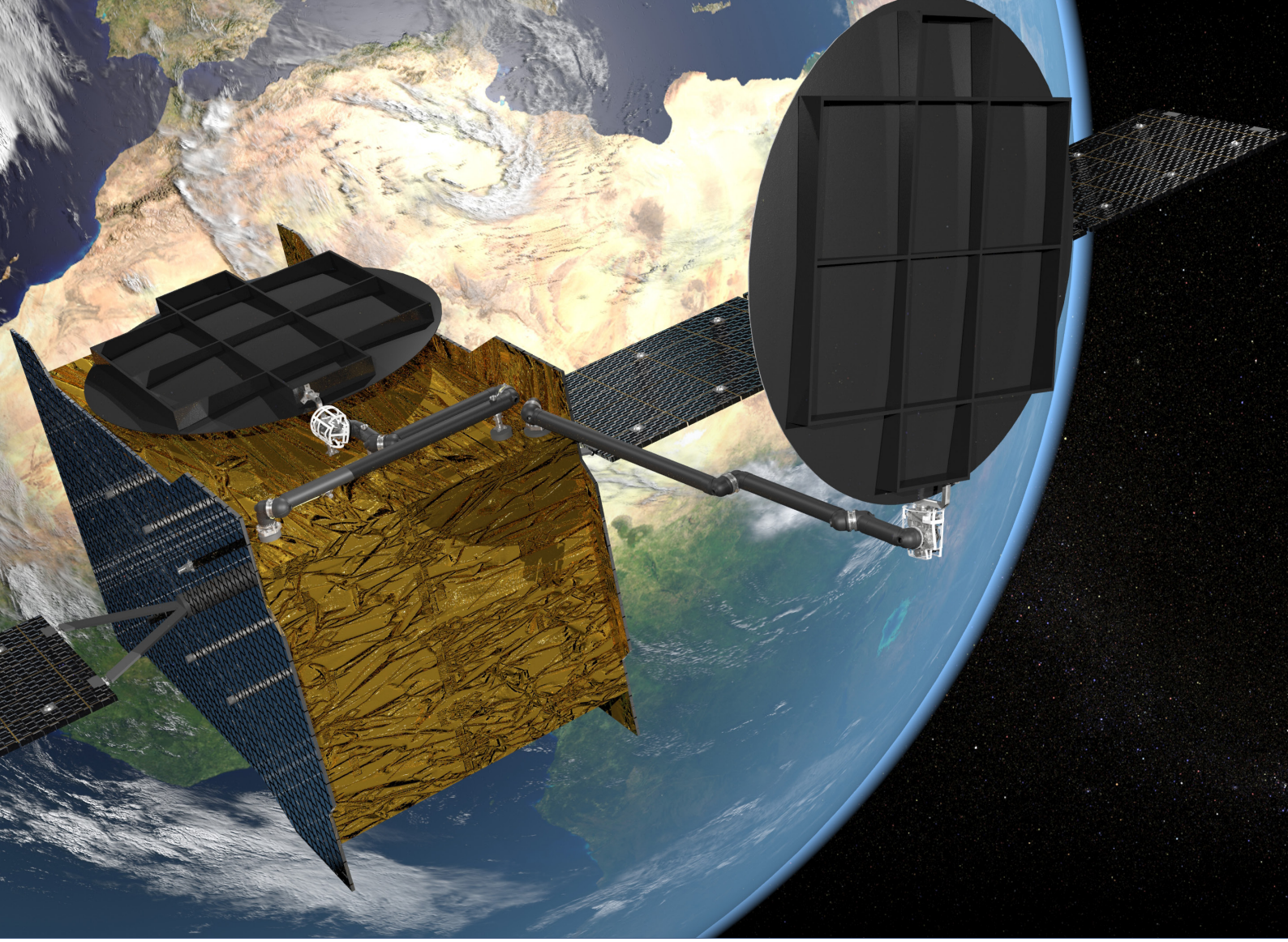


Articulated Deployment Systems

A great extension for antenna reflectors and ion thrusters

Articulated Deployment Systems enable improved payload performance, novel configurations and extended mission capability.

A wide product range of reflector and thruster booms is offered at minimum cost and lead time. The booms are configured to platform and mission specific requirements from a set of modular pre-qualified building blocks.

The reflector booms enable multi-axis deployment and pointing of large antenna reflectors and extended focal length. It provides solutions for larger reflector diameters and novel antenna configurations which cannot be achieved with traditional deployment mechanisms. Satellite operators now have the opportunity to improve antenna performance and extend payload and multi-mission capability.

The thruster booms provide deployment and pointing of ion thruster assemblies at a distance well over 3 meters from the spacecraft. A single set of ion thrusters can be used for orbit raising to GEO, N/S and E/W station keeping, and stabilisation with very efficient thrust direction. As a result, considerable fuel savings can be achieved.

AIRBUS

Articulated Deployment Systems

A great extension for antenna reflectors and ion thrusters

Heritage and availability

The boom building blocks and mechanisms are re-used or derived from units successfully used in space flight. The deployment system is based on technology also used for Airbus Defence and Space Netherlands solar arrays with 100% success in 500+ deployments.

The off-the-shelf actuators that control the deployment speed, and the pitch-and-roll reflector pointing mechanism, also have considerable flight heritage.

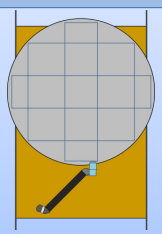
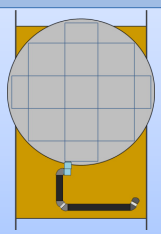
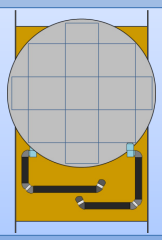
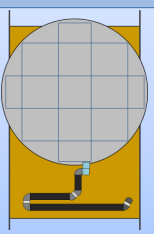
The booms have a delivery lead time of 9-12 months, including design of the specified configuration.

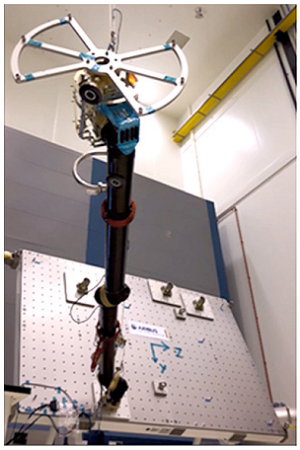
Articulated Deployment Systems will enhance your satellite mission beyond current limits

Key Features

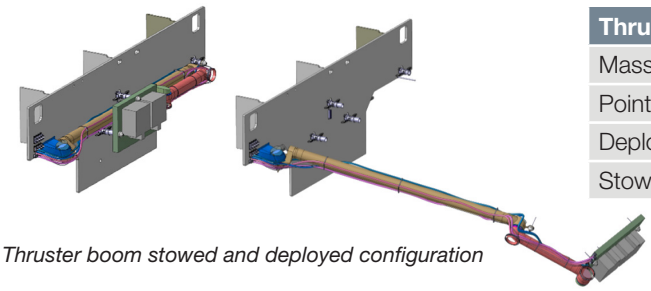
The unique boom concept allows a wide range of configurations by tuning a limited set of design parameters. For each application there is a large flexibility regarding deployment strategy, reflector / thruster positioning and pointing. The boom key features are:

- Modular build-up for variety in lengths and number of joints/boom segments
- Low non-recurring cost achieved with pre-qualified building blocks
- Highly reliable, shock-free, synchronised, spring-driven or motorized deployment
- Low mass, high stiffness and thermally stable for disturbance free pointing
- Special 3D kinematic modelling tool for early assessment and optimisation of design parameters
- Various possible configurations for accommodation on the spacecraft sidewall

one hinge	two hinges	dual two hinges	three hinges
alternative for gregorian antenna	outer reflector with deployment boom	inner & outer reflector with deployment boom	outer reflector with deployment boom
			
Range up to 1.7 m	Up to 2 m	Up to 1.8 m	Up to 4 m



Reflector boom Performance Data		
Range	1.5 ~ 4 m	with 1, 2 or 3 hinges
Gimbal step size	0.0025°	along two orthogonal axes in reflector plane
Adjustment range	±10°	in deployed state
Static inaccuracy	0.008°	gravity compensation error, deployment repeatability and measurement accuracy
Thermo-elastic distortion	<0.017°	For 1.8 m arm length
Mass	~23 kg ~29 kg	Typical mass range for 2-hinge variant of 2.8 m. Hold-downs included. Typical mass range for 3-hinge variant of 3.5 m. Hold-downs included.
Modal frequencies	65 Hz	First stowed eigenfrequency, independent of configuration
	1.0 Hz	First deployed eigenfrequency for 3-hinges variant of 3.2 m (reflector mass 23 kg). Dependent on configuration



Thruster boom stowed and deployed configuration

Thruster boom Performance Data		
Mass	23 kg	for 3.2 m arm excluding thruster module
Pointing accuracy	<0.05°	
Deployed frequency	>0.7 Hz	when fully stretched
Stowed frequency	>50 Hz	

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