

Articulated Mast Systems



Unmatched stiffness, strength, and stability—100% success heritage

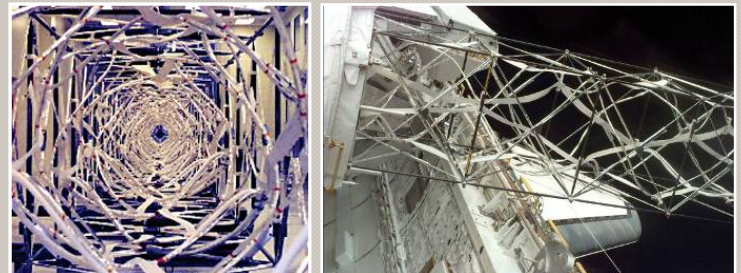
ATK's articulated mast systems are designed and manufactured for the deployment of a variety of critical spacecraft payloads, such as radar antennas and optical focal length.

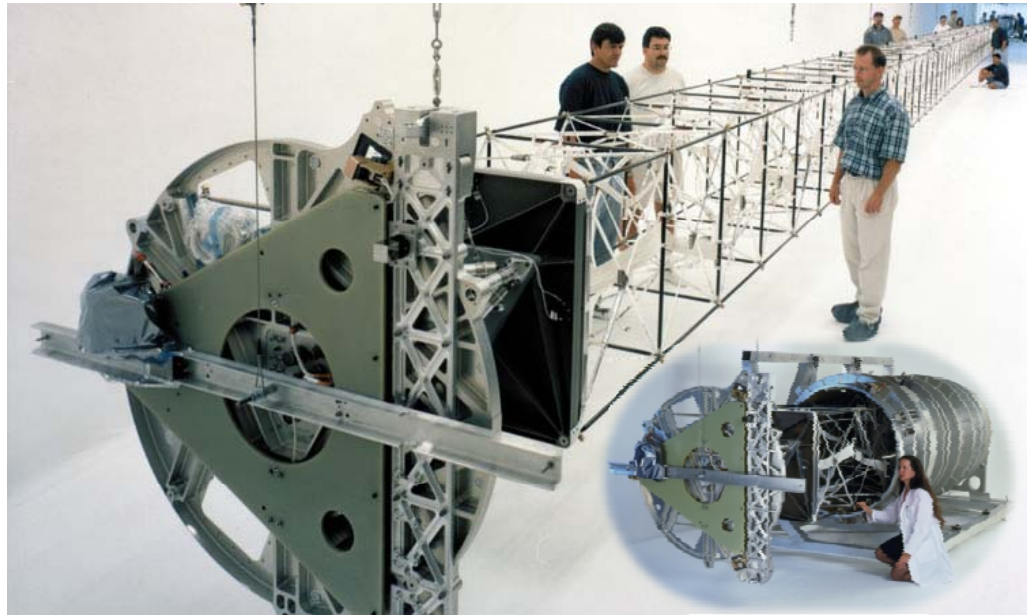
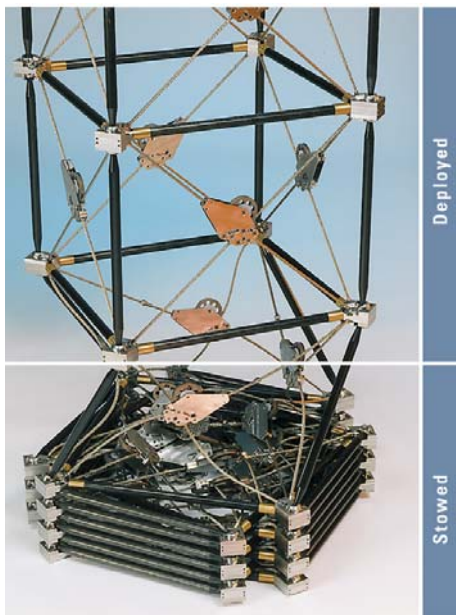
Performance Features

- High deployment reliability and repeatability
- Extensive flight heritage
- Superior stiffness and stability for critical deployed payloads
- Retraction capability
- Validated on-orbit strength and stiffness performance:
 - Lengths up to 60 m (197 ft)
 - Stiffness $> 5 \times 10^9$ lb-in²
 - Strength $> 72,000$ in-lb bending load capacity
- Precision payload deployment operation with or without active controls

Application Benefits

- Tailorable for specific mission requirements
- Compact, highly efficient stowage volume, $< 5\%$ of deployed length
- Substantial cabling and utility accommodation
- High deployment push force capability





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SRTM Deployment Accuracy and Repeatability

Length	< ± 1.3 mm (from +66 °C to -60 °C)
Tip Translation in Shear	< ± 0.25 mm
Tip Twist in Torsion	< ± 0.02°
Tip Rotation in Bending	<< ± 0.005°

Verified On-Orbit SRTM Performance

Mode	Predicted Freq. (Hz)	Measured Freq. (Hz)
First Yaw-Bending	0.095	0.094
First Roll-Bending	0.144	0.135

EXAMPLE APPLICATIONS

- SAR antenna panel deployment
- Instrument deployment/retraction
- Solar array blanket deployment
- Occulter plate/ edge deployment
- Telescope optics (focal length) deployment

Program	Customer	Launch Date	Length each (m)	Diameter (in)	EI (lb-in ²)
MODES	McDonnell Douglas	12-Sep-91			
TSS	Martin Marietta	31-Jul-92		43	1.89E+09
MODES II	McDonnell Douglas	4-Mar-94			
TSS Reflight	Martin Marietta	22-Feb-96		43	1.89E+09
IPEX II	JPL	7-Aug-97		12	
SRTM	JPL	11-Feb-00	60	44.123	5.13E+06
ISS(STS-97)	Lockheed Martin	30-Nov-00	30	43	1.89E+09
ISS (STS-115)	Lockheed Martin	9-Sep-06	30	43	1.89E+09
ISS (STS-117)	Lockheed Martin	8-Jun-07	30	43	1.89E+09
ISS (STS-119)	Lockheed Martin	15-Mar-09	30	43	1.89E+09
NuSTAR Mast	JPL	Delivered	10	12.94	

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