

## **ESPASAR-HP™**

### **High Reliability Operational Access to Space**

The Northrop Grumman ESPASAR-HP extends the capabilities of the flight-proven ESPASAR product line to create new operational mission capability. Redundant components are utilized to increase the reliability of the platform.

The ESPASAR-HP platform provides increased payload size, mass and power allocation, as well as increased  $\Delta V$  for GEO missions five years in duration or greater. The ESPASAR-HP uses the same heritage components from the successful, flight-proven ESPASAR product line and provides key enhancements to support operational missions. Enhancements include an optional M-Code compatible

GPS receiver, fully redundant avionics, "4 for 3" reaction wheel assemblies, a redundant communication subsystem, and payload hosting capability on the equipment deck to augment the 12 PPICD compliant payload ports. The ESPASAR-HP operational platform is ready to serve your mission payload needs.

# ESPASTAR-HP™

## SPECIFICATIONS

### SPACECRAFT

Orbit:	Optimized for GEO, adaptable for LEO and MEO missions
Targeted Mission Durations:	Five to seven years
Reliability:	$P_s > 0.8$ @ 5 yrs, Selective Redundancy
Dry Mass (no P/Ls):	< 900 kg (orbit-dependent)
Dimensions (no P/Ls):	157.5 cm dia. x 127 cm (62" dia. x 54" ht.)
Fuel Capacity:	558 kg
Payload Mass:	> 1,920 kg (> 320 kg per port)
Payload Power (OAP/PK):	3 kW (base), optionally up to 4 kW
Battery:	450 A-hr Li-ion
Downlink Rate:	400 kbps/5.6 Mbps via AFSCN, also USB compatible
Uplink Rate:	2.0 kbps via AFSCN
Payload Data Storage:	Up to 48 GB, dynamically allocated by mission integrator
Attitude Knowledge <sup>α</sup> :	< 10 $\mu$ rad (1 $\sigma$ )
Attitude Control <sup>β</sup> :	< 50 $\mu$ rad (1 $\sigma$ ) via 3-Axis RWA control
Jitter at Payload Interface:	< 20 $\mu$ rad, (1 $\sigma$ ), > 0.1 Hz
Slew Rate:	$\geq 0.5$ deg/sec
Position Control:	12 x 0.9-N + 4 X 22 N REAs, 6 DoF control
Position Knowledge:	< 25 m (1 $\sigma$ ), < 5 m typical

## FOR MORE INFORMATION

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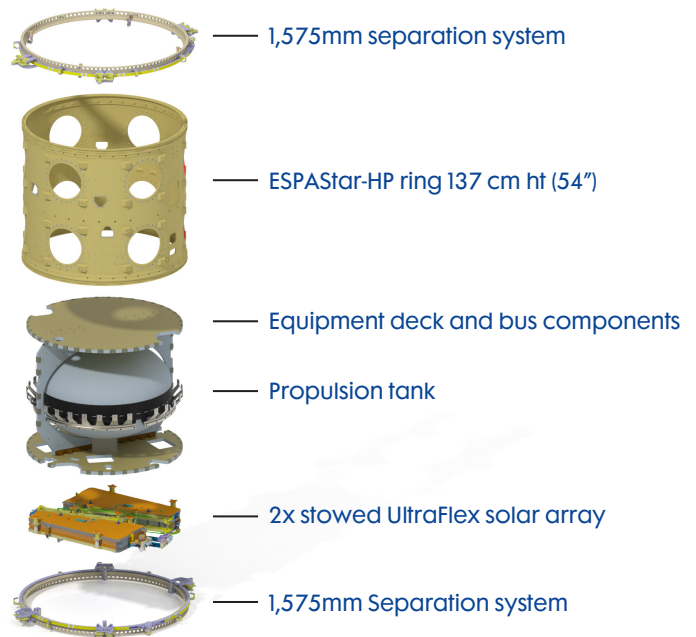
## MISSION SERVICES

- Mission Analysis
- Payload Integration
- Testing and Verification
- Launch Vehicle Integration
- Launch Operations
- Mission Operation
- Safety & Mission Assurance

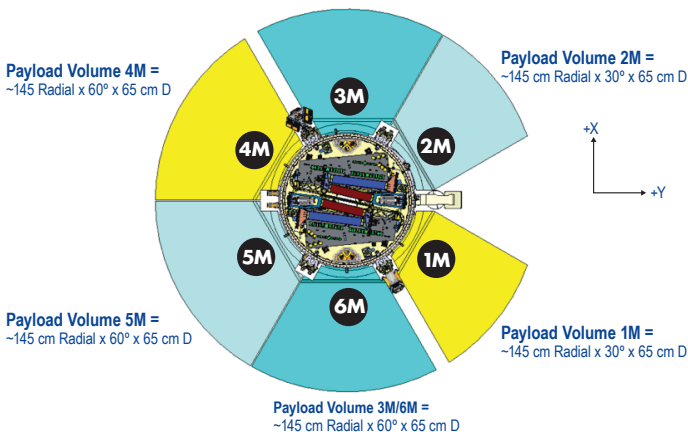
<sup>α</sup> = Assumes additional contributions to attitude knowledge error are removed by adding additional star tracker head and/or payload data

<sup>β</sup> = Assumes < 10  $\mu$ rad (1 $\sigma$ ) attitude knowledge error

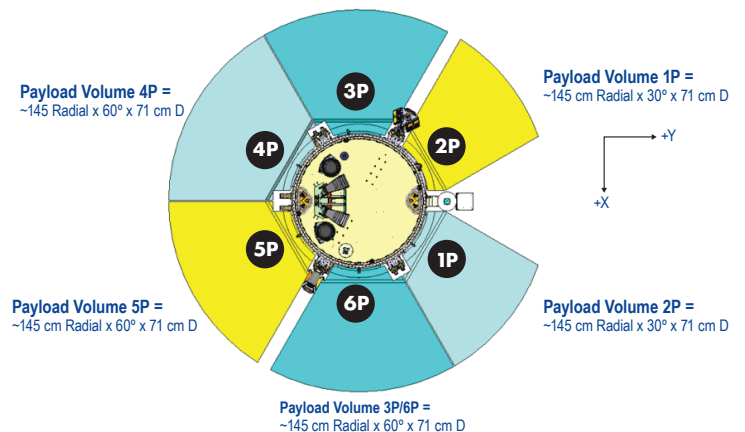
## ESPASTAR-HP PLATFORM



## Payload Volumes 1-6M



## Payload Volumes 1-6P



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