Northrop Grumman’s ESPAStar platform provides a modular, cost-effective, and highly capable infrastructure resource for hosting technology development and operational payloads. The ESPAStar platform uses a customized EELV Secondary Payload Adapter (ESPA) ring as part of its structure and is capable of being launched aboard any launch vehicle that meets the Evolved Expendable Launch Vehicle (EELV) standard interface specification, and Falcon 9. The ESPAStar platform's 6 payload ports are capable of accommodating any combination of up to 6 hosted and 12 separable (fly-away) payloads (maximum 1 hosted or 2 separables per port). The payload interface at each port has been standardized, allowing for hosted and separable payload interchangeability, late payload integration, and manifest changes. The ESPAStar platform leverages the available mass margin from any EELV launch to provide an affordable path to space for payloads. The platform is optimized for GEO missions, but is adaptable for LEO and MEO missions.

**Facts At A Glance**

- Accommodates combinations of hosted (6 max) or separable (12 max) payloads at all mounting ports
- 1086 kg payload (181 kg per Port)
- Multi-year mission life
- 1.6 Mbps downlink, AFSCN-compatible, Type 1 encryption
- Low jitter
- Attitude knowledge <20 μrad (1σ)
- ≥400 m/s delta-V, any direction
- EELV SIS Rev B compliant
- Full complement of electrical interfaces:
  - Power
  - Data
  - Discrete I/O

Note: Some payload volumes can be combined to accommodate large experiments.
### Specifications

**Spacecraft**
- **Orbit:** Optimized for GEO, adaptable for LEO and MEO missions
- **Design Life:** Multi-year mission life, single string
- **Dry Mass (no P/Ls):** 430-470 kg (orbit dependent)
- **Dimensions (no P/Ls):** 62” dia. x 24” ht.
- **Fuel Capacity:** 310 kg
- **Payload Mass:** 1086 kg (181 kg per port)
- **Total Power (BOL):** 1200 W via four-panel solar array
- **Payload Peak Power:** Tailorable based on mission profile
- **Battery:** 96 A-hr Li-ion
- **Downlink Rate:** 256 kbps/1.6 Mbps via AFSCN
  - Higher downlink rates available upon request
- **Uplink Rate:** 2.0 kbps via AFSCN
  - Higher uplink rates available upon request
- **Payload Data Storage:** 36 Gbytes non-TMR, non-volatile, 500 kbytes/day/payload SOH
- **Pointing Control:** < 20 μrad (1σ) via 3-Axis RWA control
- **Attitude Knowledge:** < 20 μrad (1σ)
- **Jitter at Payload:** < 30 μrad, (1σ), >0.1 Hz
- **Interface:**
  - **Slew Rate:** ≥ 1.2 deg/sec
  - **Position Control:** 12x 1-N and 4x 22-N REAs, 6 DoF control
  - **Position Knowledge:** < 100 m
- **Avionics:** IAU, BRE440 processor, Virtex 5 FPGA, 40 GB memory

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

### For more information:
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**ESPAT Star Platform**

- 4 panel solar array (stowed)
- Moog CSA customized ESPA ring with 4-point hard mounts
- Internal forward deck, aft deck, bulkhead structure - Aluminum honeycomb
- Hydrazine propulsion module
- RUAG clampband, top and bottom LV IF

**Payload Electrical Services**

- **High Speed TLM Data**  
- **High Speed TLM Clock**  
- **Command**  
- **Telemetry**  
- **Primary 28VDC**  
- **Power Return**  
- **Temperature Sensors**  
- **SV Heater Power**  
- **Survival Heaters**  
- **Voltage Transducers**  
- **Relay Control**  
- **Relay Pulse Return**  
- **Latch In/Out**  
- **1553B Interface**  
- **Chassis Ground**  
- **RXCLK**  
- **RXDO**  
- **RXD1**  
- **RXD2**

- **Synchronous Payload Command**  
- **UART or Space Wire Interface**  
- **Switched Primary Power**  
- **Passive Analog Inputs**  
- **Active Analog Inputs**  
- **High Level Discrete**  
- **1553B Interface**  
- **High Speed Data 3:21 SERDES**  
- **Differential Discrete Input**  
- **Differential Discrete Output/PPS**  
- **Discrete Bi-Level Input**  
- **Discrete Bi-Level Output**