Maxar 1300-Class Spacecraft Bus for RSDO Applications

DATA SHEET

CORE SPACECRAFT MISSION HERITAGE

The Maxar 1300-class spacecraft bus has been launched to GEO more than 130 times, beginning in 1989. Today there are more than 90 1300-class spacecraft providing service in orbit and 11 in production. Its success is built on the foundation of a robust modular bus, a commitment to quality and continuous improvement and over 60 years of industry-leading innovations for communications and electro-optical spacecraft design. The 1300 class has been used for a number of exciting government missions, including the Synchronous Meteorological and GOES weather missions, MTSAT-1R GEO infrared imaging mission, Psyche asteroid exploration mission and the Power and Propulsion Element of the lunar Gateway. Designed as a GEO communications and remote sensing platform, the 1300 class features a modular panel construction that enables straightforward and flexible spacecraft tailoring, which is key to its success as a platform for a variety of missions. By leveraging an active production line (currently averaging four to five deliveries and launches a year), the 1300 class offers minimal non-recurring engineering and very low technical and schedule risk.

- The 1300-class heritage hardware and software are backed by over 2,600 years of reliable on-orbit operation and proven performance.
- The data-handling system hardware architecture (Rad-750 processor based) has demonstrated high on-orbit reliability.

Key Features

- 60+ years as the industry innovation leader
- 273 satellites placed in GEO and LEO since 1958
- 2,680 combined years on-orbit achieved to date
- 91 GEO communication satellites currently operating in orbit
- 24 LEO satellites currently operating in orbit

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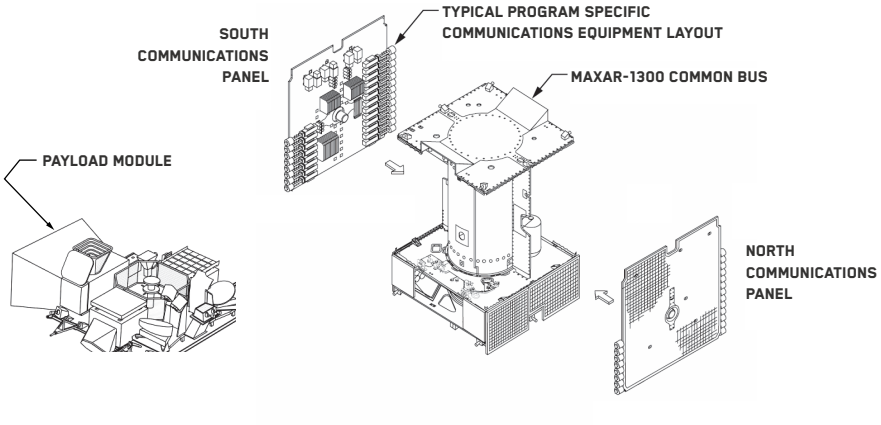
Technical Specifications

Payload Accommodation Features	
Payload mass	Up to 500 kilograms (Could go higher)
Payload power	1,973 watts (Could go higher)
Payload pointing	Roll 83, pitch 137, yaw 90 arc-sec
Payload external volume	Nominal: 2.4 m x 2.2 m x 3.1 m high
Payload internal volume	4 sections, each 2.4 m x 1.2 m x 0.31 m
Bus Features	
Orbit	GEO (MEO, LEO)
Stability mode	3 axis, dual redundant momentum bias
Pointing knowledge	< 32 arc-sec in roll, pitch and yaw
Pointing control	< 200 (3 Σ) arc-sec
Ps @ 15 years	0.85
Command & Data Handling	
Architecture	Rad-750 processor, MIL-STD-1553B, RS485
Downlink formats	CCSDS, STDN
Downlink band	S band
Data storage	Up to 5.6 Tb
Downlink rate	Up to 350 Mbps
Power	
Bus voltage	Regulated 100 V plus 31 V
Battery	Lithium-ion 144 Amp hour
Solar array	Triple junction GaAs/19 m^2
Propulsion	
Type	Chemical bi-prop
Propellant capacity	2,272 kilograms (Up to 3,800 kilograms)
Max Delta V	4,073 meters/second
Structure	
Structure	Composite and Al honeycomb
Bus dry mass	939 kilograms (payload dependent)
Lowest structural mode	14.2 Hz lateral, 35 Hz longitudinal
Compatible launch vehicle(s)	H-2A, Atlas V, Delta IV, Ariane V, Falcon 9

CORE BUS IS ADAPTABLE FOR LEO, HEO AND GEO IMAGING MISSIONS



Complete in-house cradle-to-grave capability

- Materials development and testing, design/analysis, manufacturing and inspection, assembly test (TC/TVAC/Static/Vibe/Acoustic)
- Graphite composite structure, honeycomb panels, load bearing, central cylinder
- 1300-class satellite family is modular and scalable to higher power and more payload capacity

Type and power capability of electrical power subsystem

- 144-Ah lithium-ion battery (18 cells each)
- Direct energy transfer with single power bus regulated at 100 V, plus 31 V low-voltage bus
- One or two conventional three-panel solar array wing design
- All panels fully populated with advanced triple junction Gallium arsenide (GaAs) cells

Attitude control architecture

- Heritage three-axis momentum bias system with robust four-wheel control
- Flight-proven gyros (2x) for inertial guidance
- Advanced 2:1 star-trackers for precision attitude knowledge
- Heritage suites of redundant sun sensors

Communication systems

- UHF, L, X, Ka, Ku, S, C bands

Command and data handling

- Distributed data-handling architecture with 2:1 redundant Rad-750 central control processors
- MIL-STD-1553B serial data bus and lower-level RS-485 buses data architecture
- RS-485 routers, with serial interface modules
- Command and telemetry AE capability

Means of spacecraft thermal control

- Standard passive thermal control system with dual-bore matrix heat pipes in communication panels
- Optical solar reflectors used on communications panels

Propulsion

- Pressure-fed liquid system using hypergolic bi-propellants (MMH and N_2O_4) with 2,272 kg capacity tanks and helium pressurant
- 12 heritage attitude and orbit control thrusters

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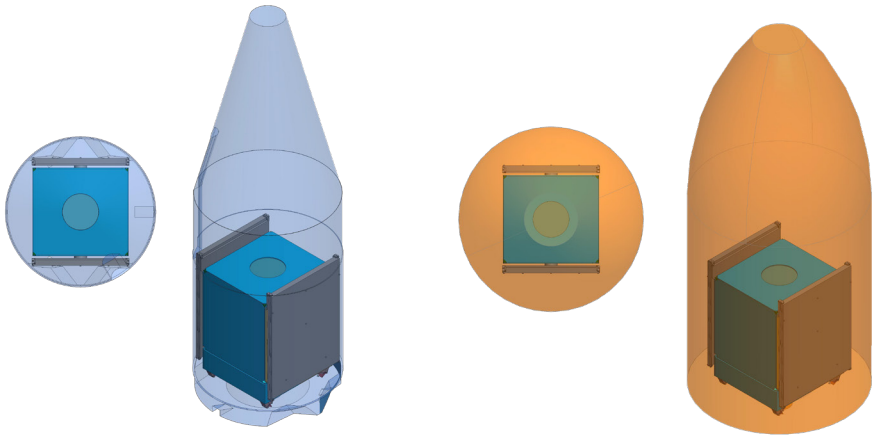
Launch Compatibility and Orbit Capability

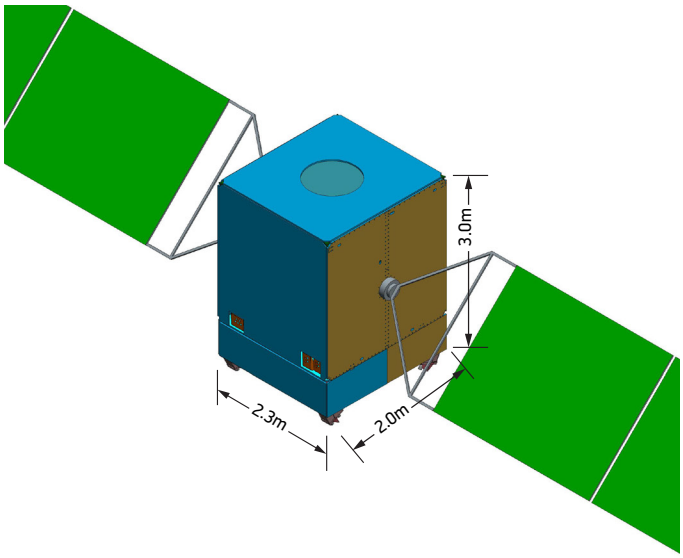
- Maxar has either integrated or launched spacecraft on all of the candidate launch vehicle families.
- As our spacecraft design is compatible with all candidate launch service providers, we can typically offer a very late launch vehicle selection date.
- Contract baseline delivery schedule, ARO through launch and on-orbit checkout, showing all major reviews

LAUNCH CONFIGURATIONS



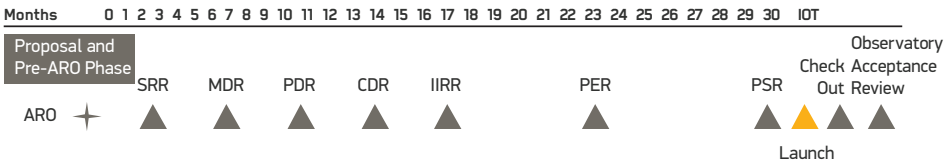
Atlas V

Falcon 9



IMPLEMENTATION SCHEDULE

Milestones and reviews



ATLAS V LAUNCH

FALCON 9 LAUNCH

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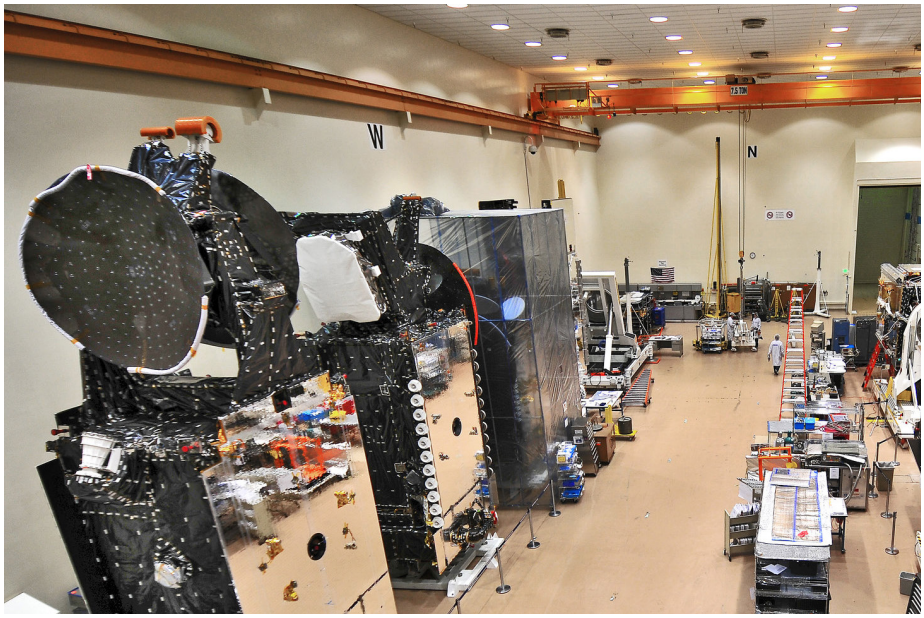
Facilities Overview and Use Plan

- Maxar can accommodate 10K clean room requirements within our typical 100K clean room high bay by localized dedicated tenting, as employed on previous contamination-sensitive missions including GOES 8-12 and MTSAT-1R. For small spacecraft buses, Maxar has dedicated 10K facilities used to build spacecraft in our LEO manufacturing facility.
- Approximately 100,000 sq. ft. clean room capacity
- >165,000-square-foot general manufacturing space
- Maxar's Palo Alto, California, facility contains two spacecraft thermal vacuum chambers, acoustic facility and spacecraft vibration tables.
- Dedicated environmental test teams provide focused and effective test implementation.

Available add-on capabilities

- Ground systems
- On-orbit data processing
- On-orbit operations support
- Hosted payloads
- Increased data storage
- Higher-power payloads



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