

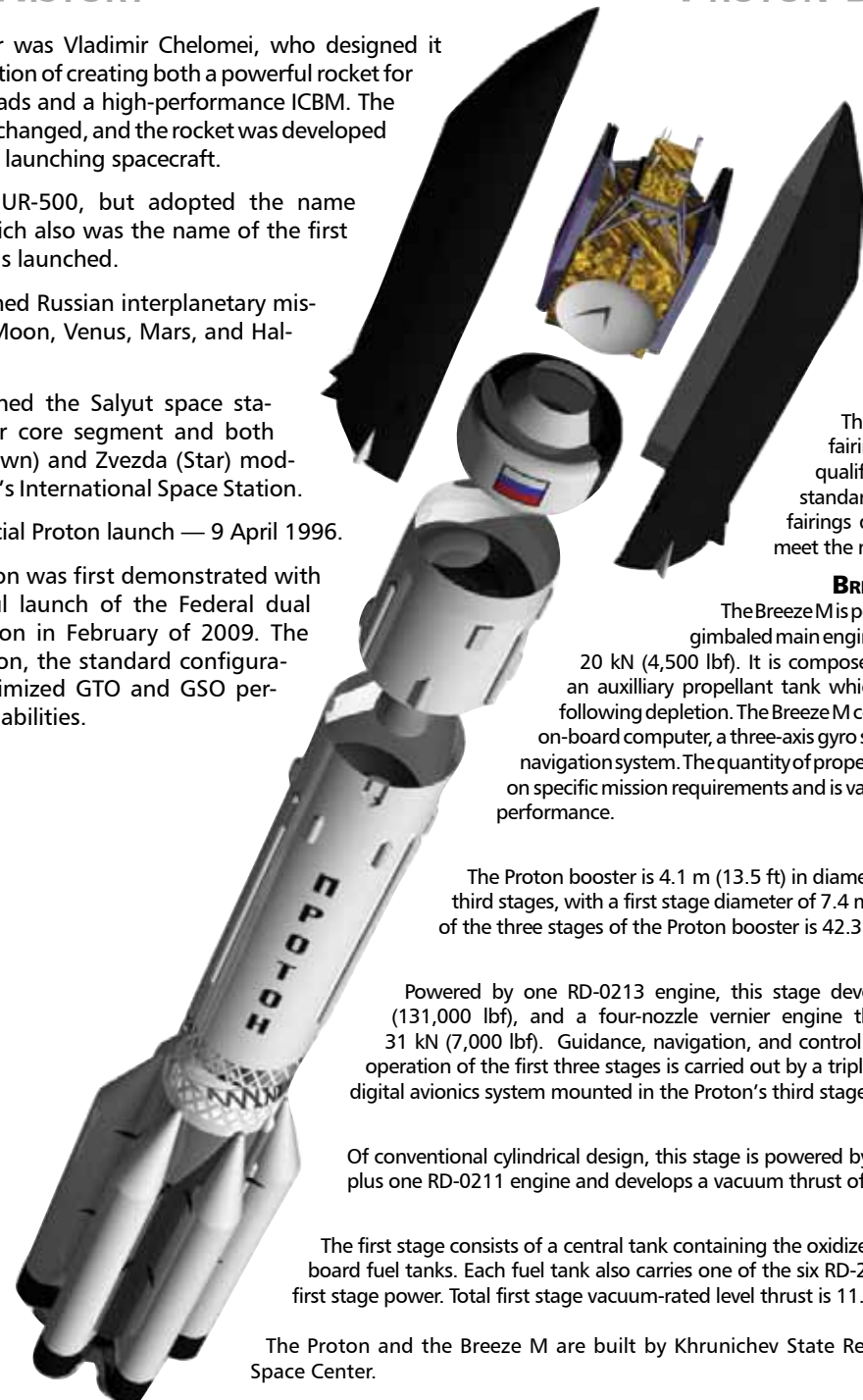
# THE VEHICLE

# THE SATELLITE

## PROTON HISTORY

- Lead designer was Vladimir Chelomei, who designed it with the intention of creating both a powerful rocket for military payloads and a high-performance ICBM. The program was changed, and the rocket was developed exclusively for launching spacecraft.
- First named UR-500, but adopted the name "Proton," which also was the name of the first three payloads launched.
- Proton launched Russian interplanetary missions to the Moon, Venus, Mars, and Halley's Comet.
- Proton launched the Salyut space stations, the Mir core segment and both the Zarya (Dawn) and Zvezda (Star) modules for today's International Space Station.
- First commercial Proton launch — 9 April 1996.
- Phase III Proton was first demonstrated with the successful launch of the Federal dual Express mission in February of 2009. The Phase III Proton, the standard configuration, has optimized GTO and GSO performance capabilities.

## PROTON DESCRIPTION



**TOTAL HEIGHT**  
58.2 m (191 ft)

**GROSS LIFTOFF WEIGHT**  
705,000 kg  
(1,554,000 lb)

**PROPELLANT**  
UDMH and NTO

**INITIAL LAUNCH**  
16 July 1965  
Proton-1 Spacecraft

**PAYLOAD FAIRINGS**  
There are multiple payload fairing designs presently qualified for flight, including standard commercial payload fairings developed specifically to meet the needs of our customers.

**BREEZE M UPPER STAGE**  
The Breeze M is powered by one pump-fed gimbaled main engine that develops thrust of 20 kN (4,500 lbf). It is composed of a central core and an auxiliary propellant tank which is jettisoned in flight following depletion. The Breeze M control system includes an on-board computer, a three-axis gyro stabilized platform, and a navigation system. The quantity of propellant carried is dependent on specific mission requirements and is varied to maximize mission performance.

**PROTON BOOSTER**  
The Proton booster is 4.1 m (13.5 ft) in diameter along its second and third stages, with a first stage diameter of 7.4 m (24.3 ft). Overall height of the three stages of the Proton booster is 42.3 m (138.8 ft).

**THIRD STAGE**  
Powered by one RD-0213 engine, this stage develops thrust of 583 kN (131,000 lbf), and a four-nozzle vernier engine that produces thrust of 31 kN (7,000 lbf). Guidance, navigation, and control of the Proton M during operation of the first three stages is carried out by a triple redundant closed-loop digital avionics system mounted in the Proton's third stage.

**SECOND STAGE**  
Of conventional cylindrical design, this stage is powered by three RD-0210 engines plus one RD-0211 engine and develops a vacuum thrust of 2.4 MN (540,000 lbf).

**FIRST STAGE**  
The first stage consists of a central tank containing the oxidizer surrounded by six out-board fuel tanks. Each fuel tank also carries one of the six RD-276 engines that provide first stage power. Total first stage vacuum-rated level thrust is 11.0 MN (2,500,000 lbf).

The Proton and the Breeze M are built by Khrunichev State Research and Production Space Center.



**SATELLITE OPERATOR**  
SIRIUS XM Radio  
[www.sirius.com](http://www.sirius.com)

**SATELLITE MANUFACTURER**  
Space Systems/Loral  
[www.ssloral.com](http://www.ssloral.com)

**PLATFORM**  
SS/L 1300

**SEPARATED MASS**  
5984 kg

**SATELLITE DESIGN LIFE**  
15 Years

### SATELLITE MISSION

SIRIUS XM-5 is a high-power geostationary satellite from SIRIUS XM Radio, America's satellite radio company and the leader in audio entertainment. SIRIUS XM-5 will serve as an in orbit spare for the existing fleet of SIRIUS and XM satellites. It will ensure SIRIUS XM's array of audio and data services are received robustly by cars, mobile devices and home receivers and will play an important role in bolstering the continuity of our service for years to come. XM-5 will help with the delivery of hundreds of channels of commercial-free music, premier sports, news, talk, entertainment, traffic and weather to close to 20 million subscribers, as well as services such as XM NavTraffic®, which delivers real-time traffic information to markets across North America for vehicles with navigational systems. SIRIUS XM is installed in vehicles of every major automaker and available for sale at retail locations nationwide.



## Mission Overview



**Experience ILS: Achieve Your Mission**  
QUALITY | PERFORMANCE | EXPERIENCE | DEDICATION

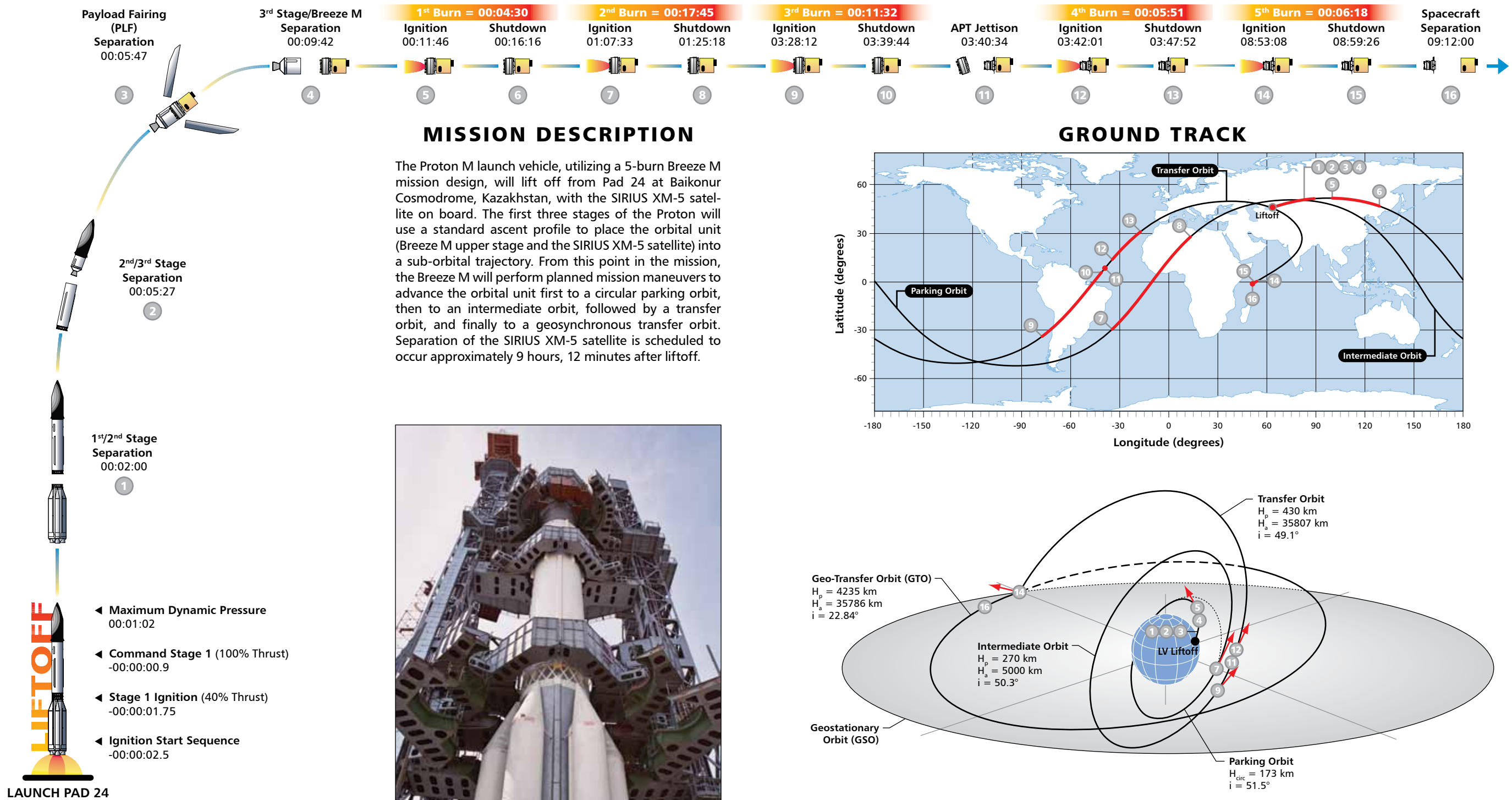


[www.ilslaunch.com](http://www.ilslaunch.com)

## SIRIUS XM-5

- 8th Proton Launch in 2010
- 6th ILS Proton Launch in 2010
- 62nd ILS Proton Launch overall
- 5th SIRIUS XM Satellite Launched on an ILS Proton
- 16th Space Systems/Loral Satellite Launched on an ILS Proton

# THE MISSION



ASCENT PROFILE

PROTON ON PAD 24

FLIGHT DESIGN