

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.
- First commercial Proton M Breeze M launch — 30 December 2002, Nimiq-2

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

ViaSat Inc.
www.viasat.com

SATELLITE MANUFACTURER

Space Systems/Loral
www.ssloral.com

PLATFORM

SS/L 1300

SEPARATED MASS

6,740 kg

SATELLITE MISSION LIFETIME

15 Years

SATELLITE MISSION

ViaSat's first satellite is the highest throughput satellite ever built. The total capacity is in excess of 130 Gbps, more than all other satellites over North America combined. The all Ka-band spot beam ViaSat-1 is designed to transform the quality of satellite broadband service through a new system design that focuses on maximizing total bandwidth throughput. In this way, the cost per bit is reduced to a fraction of that provided by previous generation satellites, radically changing the economics and performance of satellite communications. The satellite, to be located at 115°W, will use 72 beams to cover 75% of the Continental United States, as well as the most populated areas of Alaska, Hawaii, and Canada.



Mission Overview

Experience ILS: Achieve Your Mission

QUALITY | PERFORMANCE | EXPERIENCE | DEDICATION

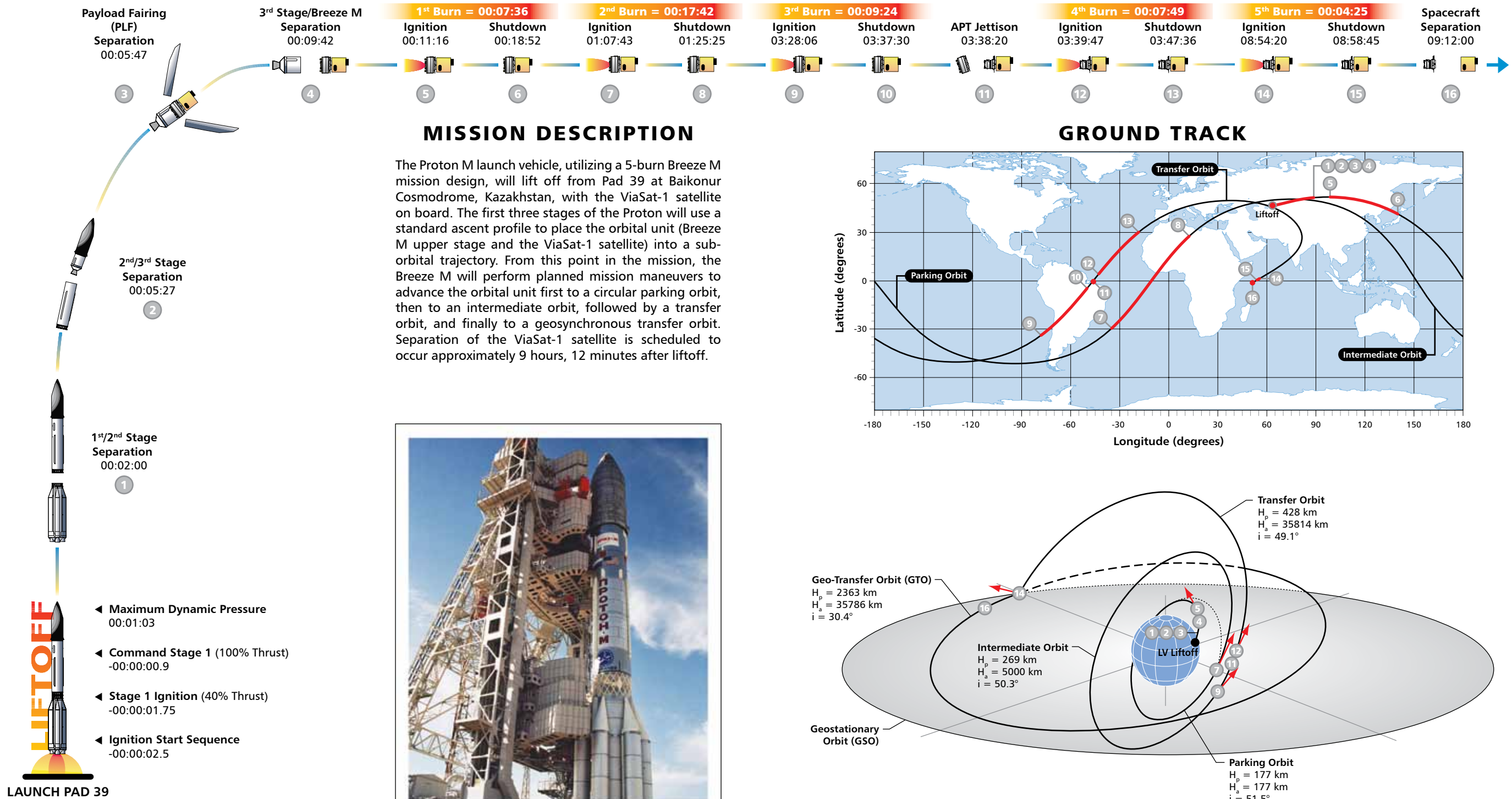
www.ilslaunch.com

ViaSat-1

- 1st Satellite for ViaSat
- 19th Space Systems/Loral Satellite Launched on ILS Proton
- 4th ILS Proton Launch in 2011
- 68th ILS Proton Launch Overall



THE MISSION



ASCENT PROFILE

PROTON ON PAD 39

FLIGHT DESIGN