

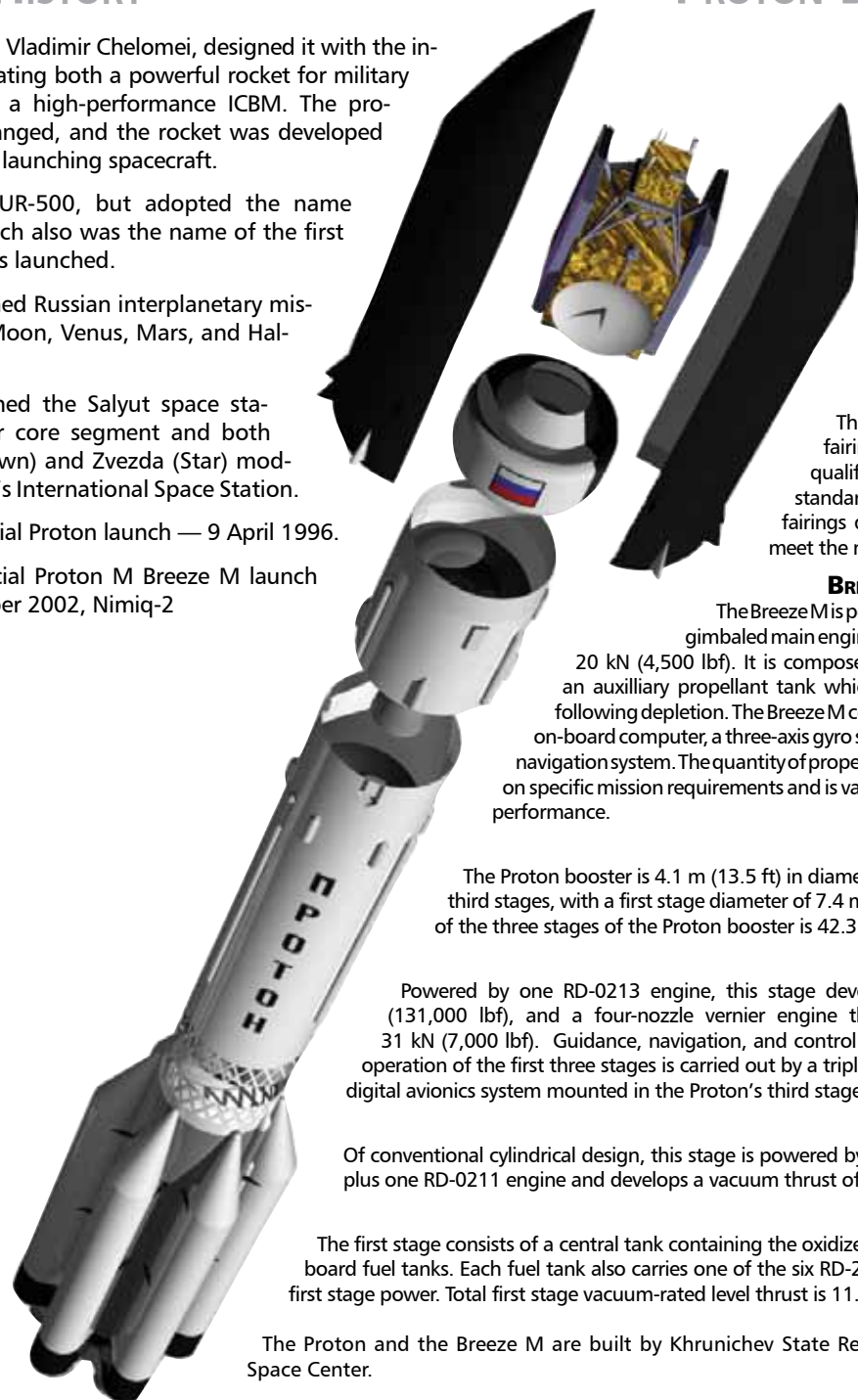
THE VEHICLE

THE SATELLITE

PROTON HISTORY

- Lead designer, Vladimir Chelomei, 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
SES
www.ses.com

SATELLITE MANUFACTURER
Space Systems/Loral
www.ssloral.com

PLATFORM
SS/L 1300

SEPARATED MASS
6,180 kg

SATELLITE MISSION LIFETIME
15 Years

SATELLITE MISSION

Poised to be the largest satellite in the SES fleet, SES-4 at 338° East replacing NSS-7, will enhance what is already the largest neighborhood in the Atlantic. SES-4 will be a hybrid satellite featuring high powered C-band coverage and incremental global capacity which is ideal for video distribution, government and VSAT services. The satellite's Ku-band payload will provide enhanced coverage and capacity across Europe, the Middle East, Africa, Western Africa and Latin America. SES-4 will bring a substantial increase in the total capacity available at 338° East. The state-of-the-art spacecraft has been specifically designed for its orbital location, with C-band beams serving the eastern hemisphere of Europe/Africa, full America's coverage as well as a global beam to support mobile and maritime customers. Four high powered regional Ku-band beams will provide service to Europe, the Middle East, West Africa, North America and South America with extensive cross-strapping between C- and Ku-band transponders providing enhanced connectivity.



Mission Overview

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

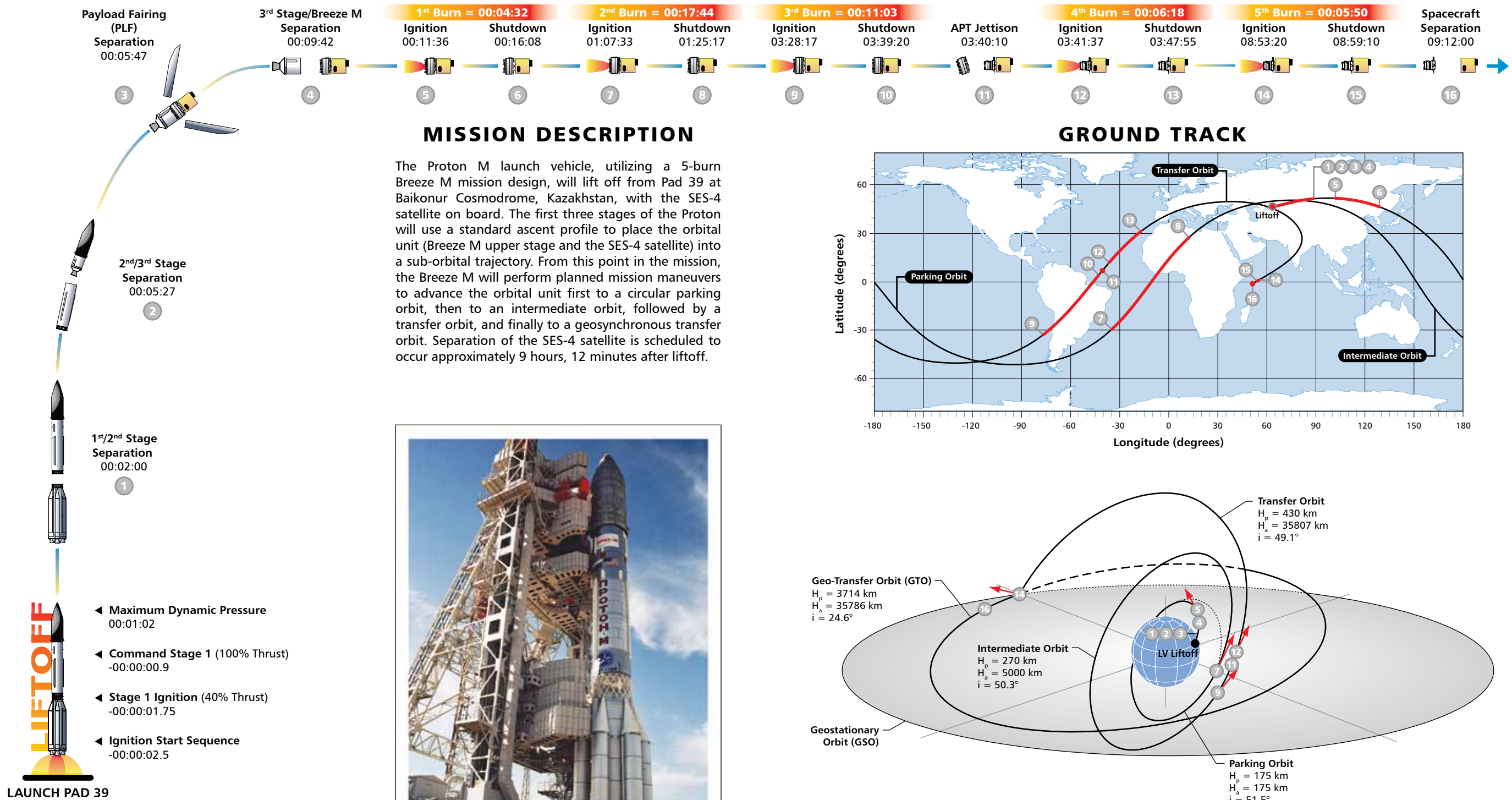
www.ilslaunch.com



SES-4

- **20th** SES Satellite Launch on ILS Proton
- **21st** Space Systems/Loral Satellite Launched on ILS Proton
- **1st** ILS Proton Launch in 2012
- **70th** ILS Proton Launch Overall

THE MISSION



ASCENT PROFILE

PROTON ON PAD 39

FLIGHT DESIGN