

# THE VEHICLE

# THE SATELLITE

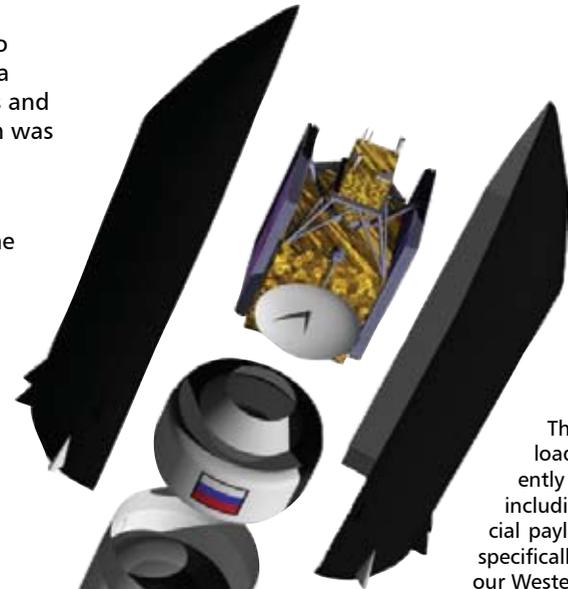


www.ilslaunch.com

## PROTON HISTORY

- Lead designer was Vladimir Chelomei, who designed it with the intention of creating a powerful rocket for both military payloads and as 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, ASTRA 1F.

## PROTON DESCRIPTION



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

**GROSS LIFTOFF WEIGHT**  
702,000 kg  
(1,547,000 lb)

**PROPELLANT**  
UDMH and N<sub>2</sub>O<sub>4</sub>

**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 Western customers.

### BREEZE M UPPER STAGE

The Breeze M is powered by one pumped gimbaled main engine that develops thrust of 19.6 kN (4,400 lbf). The Breeze M is composed of a central core and a jettisonable additional propellant tank. Inert mass of the stage at liftoff is approximately 2,370 kg (5,225 lb). The quantity of propellant carried is dependent on specific mission requirements and is varied to maximize mission performance. The Breeze M is controlled by a closed loop, triple-redundant guidance system.

### 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 7.3 m (24.0 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).

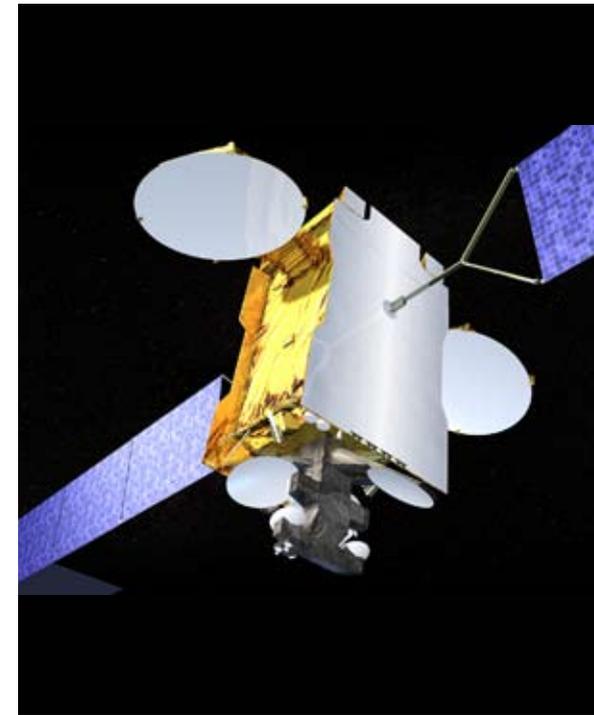
### SECOND STAGE

Of conventional cylindrical design, this stage is powered by three RD-0210 engines plus one RD-0211 engine and develops a vacuum thrust of 2.3 MN (517,000 lbf).

### FIRST STAGE

The first stage consists of a central tank containing the oxidizer surrounded by six outboard fuel tanks. Each fuel tank also carries one of the six RD-275 engines that provide first stage power. Total first stage sea-level thrust is approximately 9.6 MN (2,158,000 lbf) with a vacuum-rated level thrust of 10.5 MN (2,360,000 lbf).

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



### SATELLITE OPERATOR

Telesat  
www.telesat.com

### SATELLITE MANUFACTURER

EADS Astrium  
www.astrium.eads.net

### PLATFORM

Eurostar E3000

### SEPARATED MASS

4,850 kg

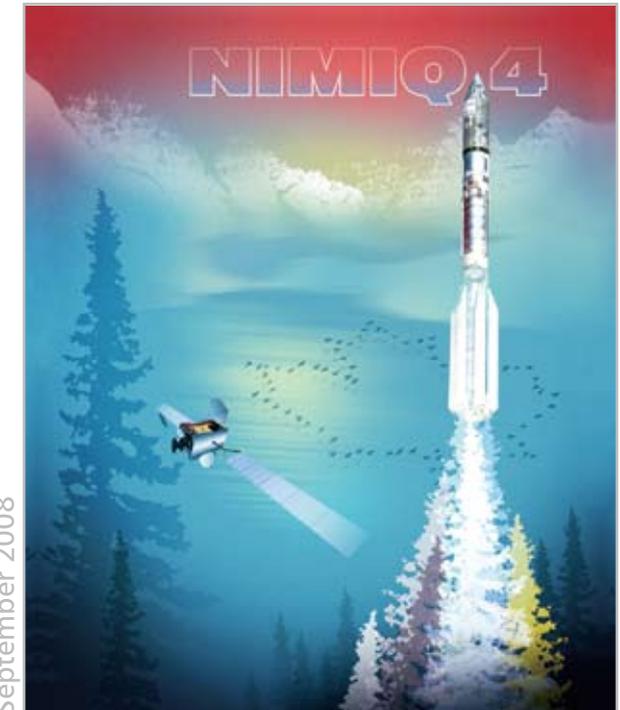
### SATELLITE DESIGN LIFE

15+ Years

### MISSION

Nimiq 4 is a commercial communications satellite built by EADS Astrium. The satellite has two payloads for Canadian broadcast services. The main payload has 32 Ku-band channels providing specialty television and foreign language programming. The second, smaller payload has 8 Ka-band channels spread over six beams covering Canada for advanced services such as high-definition television. The satellite will be located at 82° West longitude. Nimiq satellites are dedicated to the provision of direct-to-home services for Bell TV.

September 2008

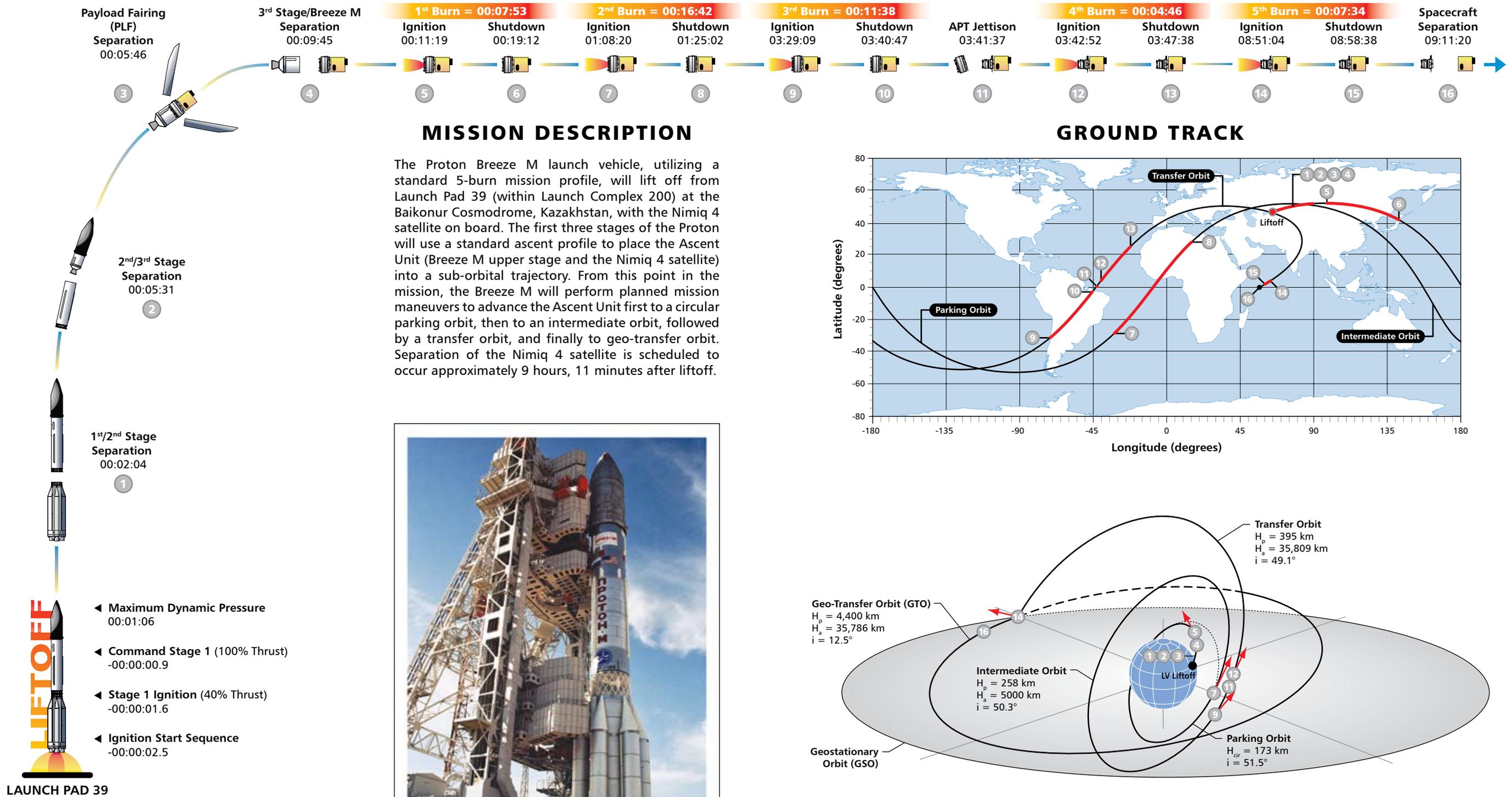


## Nimiq 4

### MISSION OVERVIEW

- 4th ILS launch of 2008
- 47th Proton launch for ILS
- 10th Eurostar satellite launched on Proton
- 5th Telesat satellite launched with ILS Proton

# THE MISSION



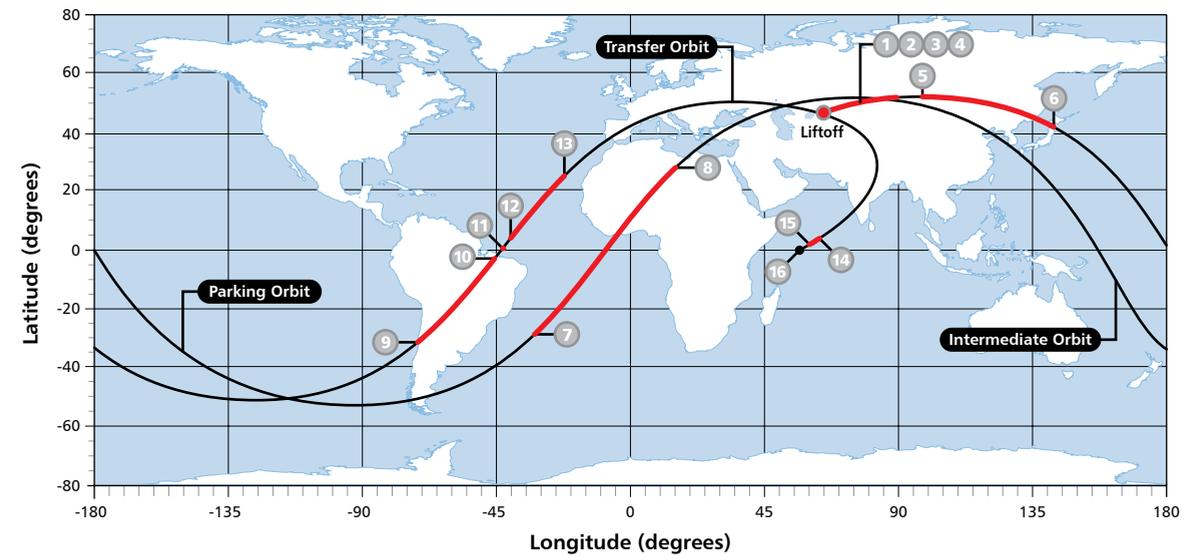
## MISSION DESCRIPTION

The Proton Breeze M launch vehicle, utilizing a standard 5-burn mission profile, will lift off from Launch Pad 39 (within Launch Complex 200) at the Baikonur Cosmodrome, Kazakhstan, with the Nimiq 4 satellite on board. The first three stages of the Proton will use a standard ascent profile to place the Ascent Unit (Breeze M upper stage and the Nimiq 4 satellite) into a sub-orbital trajectory. From this point in the mission, the Breeze M will perform planned mission maneuvers to advance the Ascent Unit first to a circular parking orbit, then to an intermediate orbit, followed by a transfer orbit, and finally to geo-transfer orbit. Separation of the Nimiq 4 satellite is scheduled to occur approximately 9 hours, 11 minutes after liftoff.



PROTON M ON PAD 39

## GROUND TRACK



ASCENT PROFILE

ORBIT INSERTION