# 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.

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First commercial Proton M Breeze M launch
 30 December 2002 — NIMIQ 2 for Telesat



Total Height 56.2 m (184 ft)

## Gross Lift-off 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 auxilliary 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 outboard 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

Telesat www.telesat.com

#### SATELLITE MANUFACTURER

Space Systems/Loral www.ssloral.com

**PLATFORM** 

SS/L 1300

### SEPARATED MASS

4905 kg

## SATELLITE MISSION LIFETIME

15 Years

### SATELLITE MISSION

Anik G1 is a commercial communications satellite built by Space Systems/Loral for Telesat. The multi-mission, 55 transponder satellite will be located at 107.3° West longitude. This satellite will double C- and Ku-band capacity over South America from this orbital location, provide additional DTH services in extended Ku Band and provide military X-band coverage of the Americas and substantial portions of the Pacific Ocean.



## **Mission Overview**



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QUALITY | PERFORMANCE | EXPERIENCE | DEDICATION



www.ilslaunch.com

## Anik G1

- 9th Telesat Satellite Launched on ILS Proton
- **26th** Space Systems/Loral Satellite Launched on ILS Proton
- 79th ILS Proton Launch Overall
- 2nd ILS Proton Launch in 2013

# THE MISSION

 $3^{rd}$  Burn = 00:14:27

Shutdown

03:42:57

**APT Jettison** 

03:43:47

Ignition

03:28:30

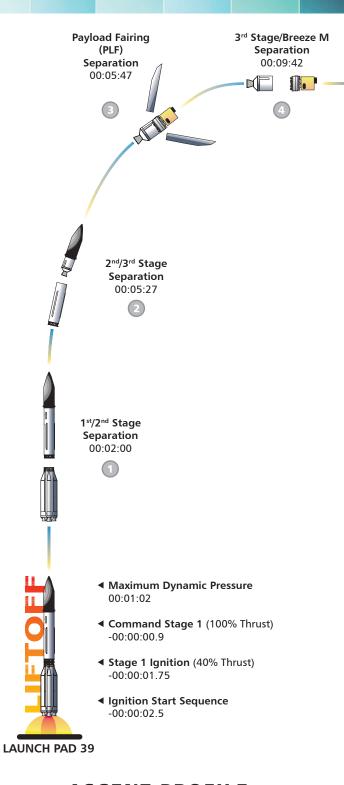
2<sup>nd</sup> Burn = 00:17:46

Shutdown

01:25:19

Ignition

01:07:33



# MISSION DESCRIPTION

 $1^{st}$  Burn = 00:04:26

Shutdown

00:16:12

Ignition

00:11:46

The Proton M launch vehicle, utilizing a 5-burn Breeze M mission design, will lift off from Pad 39 at Baikonur Cosmodrome, Kazakhstan, with the Anik G1 satellite on board. The first three stages of the Proton will use a standard ascent profile to place the orbital unit (Breeze M upper stage and the Anik G1 satellite) into a sub-orbital trajectory. From this point in the mission, the Breeze M will perform planned mission maneuvers to advance the orbital unit first to a circular parking orbit, then to an intermediate orbit, followed by a transfer orbit, and finally to a geostationary transfer orbit. Separation of the Anik G1 satellite is scheduled to occur approximately 9 hours, 13 minutes after liftoff.



## **GROUND TRACK**

Shutdown

03:48:23

 $5^{th}$  Burn = 00:08:56

**Shutdown** 

09:00:31

Ignition

08:51:35

Spacecraft

Separation

09:13:00

 $4^{th}$  Burn = 00:03:09

Ignition

03:45:14

