

THE VEHICLE

THE SATELLITE

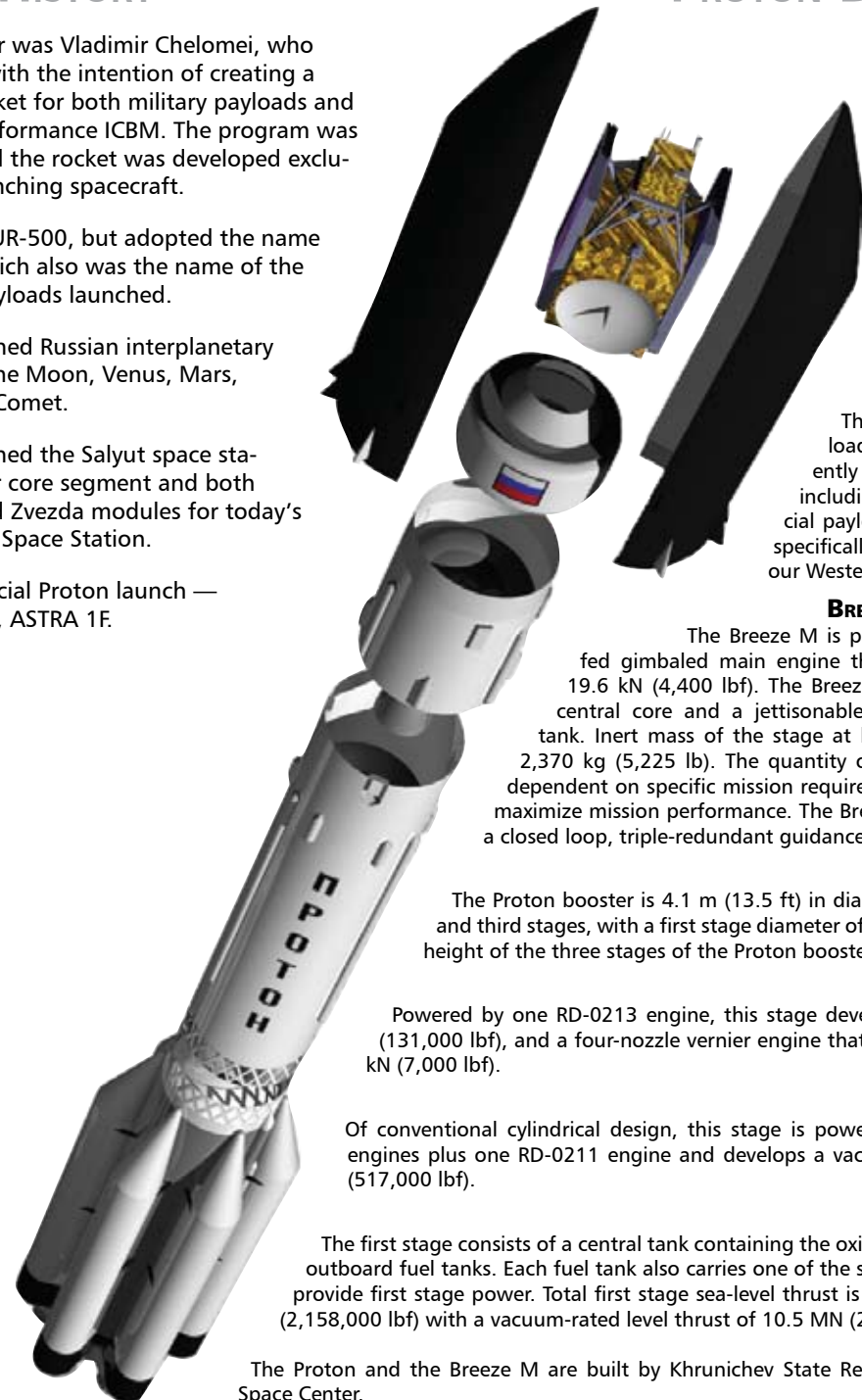


www.ilslaunch.com

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 and Zvezda modules for today's International Space Station.
- First commercial Proton launch — April 9, 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 N2O4

INITIAL LAUNCH
July 16, 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
Inmarsat
www.inmarsat.com

SATELLITE MANUFACTURER
EADS Astrium
www.astrium.eads.net

PLATFORM
Eurostar E3000 GM

SEPARATED MASS
5,960 kg

SATELLITE OPERATING UNTIL
Into the 2020's

MISSION

The Inmarsat-4 satellites are the most advanced commercial communications satellites ever launched. The I-4 F3 is part of the Inmarsat's \$1.5 billion next-generation global satellite network. The I-4 network supports new mobile broadband services, delivering enhanced voice and high-speed data (up to 492kbps) services to users on land, at sea and in the air.



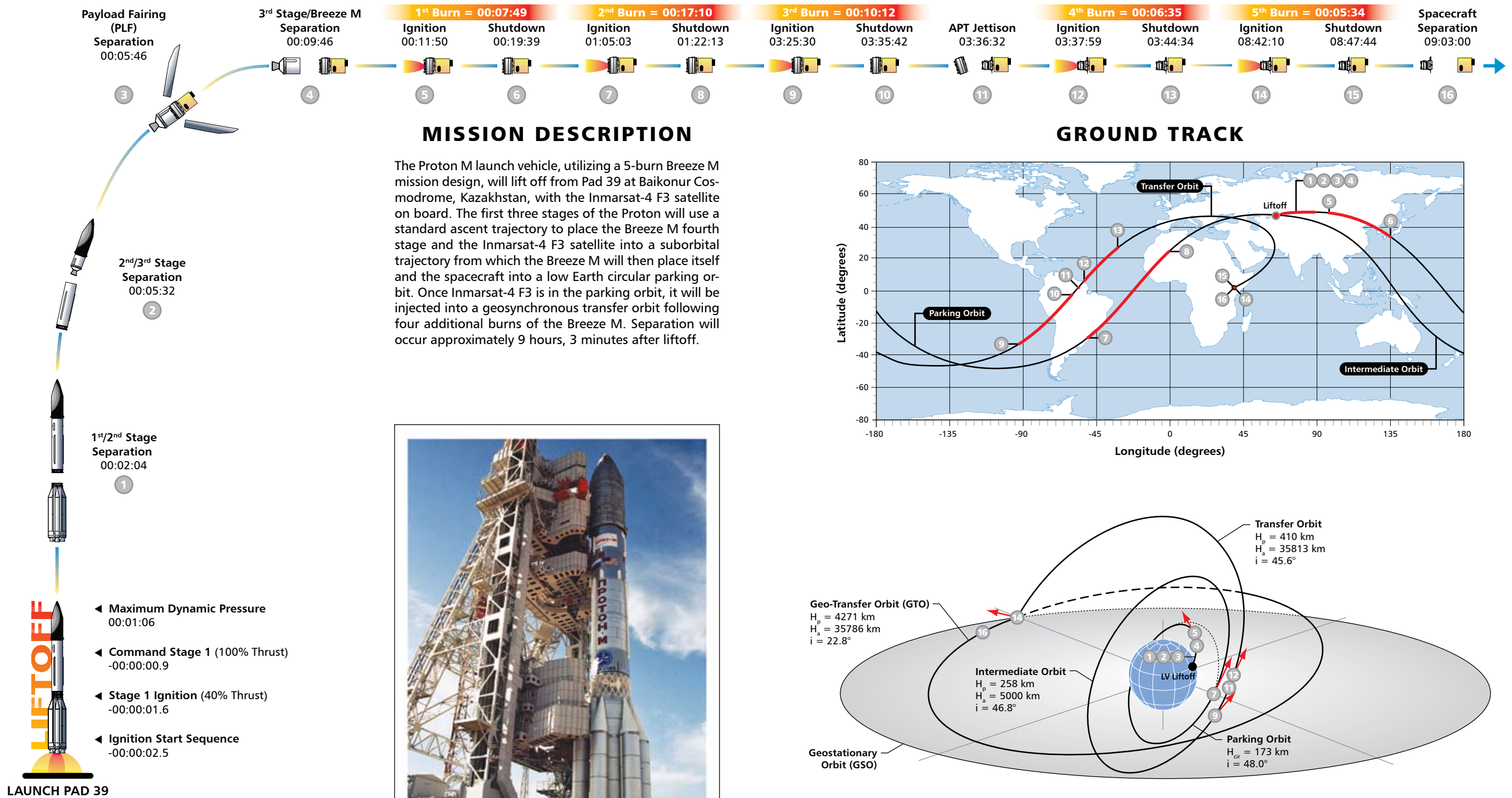
August 2008

Inmarsat-4 F3

MISSION OVERVIEW

- 3rd ILS launch of 2008
- 46th Proton launch for ILS
- 9th Eurostar satellite launched on Proton

THE MISSION



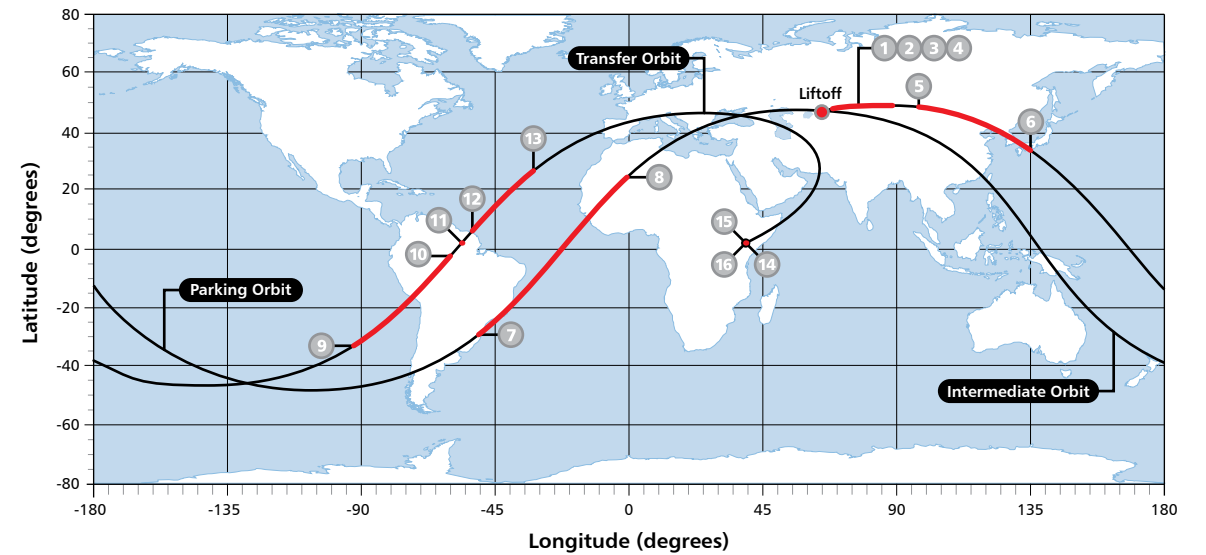
MISSION DESCRIPTION

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 Inmarsat-4 F3 satellite on board. The first three stages of the Proton will use a standard ascent trajectory to place the Breeze M fourth stage and the Inmarsat-4 F3 satellite into a suborbital trajectory from which the Breeze M will then place itself and the spacecraft into a low Earth circular parking orbit. Once Inmarsat-4 F3 is in the parking orbit, it will be injected into a geosynchronous transfer orbit following four additional burns of the Breeze M. Separation will occur approximately 9 hours, 3 minutes after liftoff.



PROTON M ON PAD 39

GROUND TRACK



ORBIT INSERTION

ASCENT PROFILE