

Proton

TOTAL HEIGHT
58.2 m (191 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 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 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

SATELLITE OPERATOR
TURKSAT
www.turksat.com.tr

SATELLITE MANUFACTURER
MELCO
www.mitsubishielectric.com

PLATFORM
DS2000

SEPARATED MASS
4924 kg

SATELLITE DESIGN LIFETIME
15 Years



SATELLITE MISSION

TURKSAT-4B is a commercial communication satellite built by MELCO. The satellite will provide telecommunication and direct TV broadcasting services over a wide geographic region between west of China and east of England spanning Turkey, as well as Europe, Central Asia, the Middle East and Africa. TURKSAT-4B consists of several band transponders with expected on-orbit Maneuver Life of 30 years. TURKSAT-4B satellite will expand the space capacity of Turkey and provide enhanced performance to its coverage areas. The satellite will provide high flexibility of switchability and connectivity among different service areas to its customers.

Mission Overview



- 4th ILS Proton Launch in 2015
- 91st ILS Proton Launch Overall
- 2nd TURKSAT Satellite Launched on ILS Proton
- 2nd MELCO Satellite Launched on ILS Proton

TURKSAT-4B



