

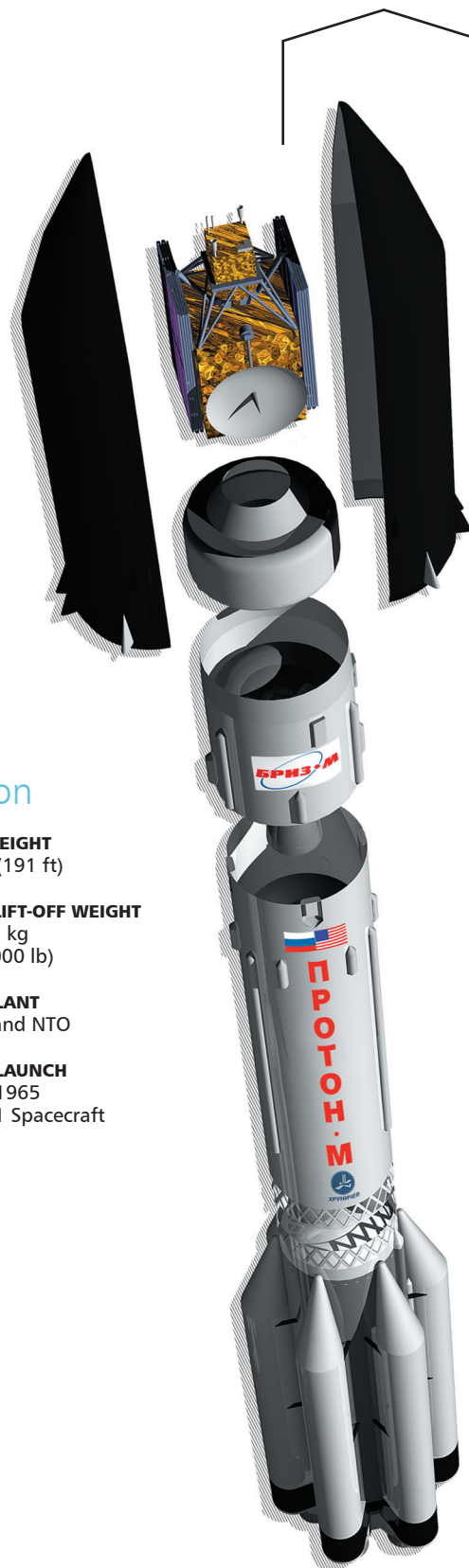
## Proton

**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**  
SES  
[www.ses.com](http://www.ses.com)

**SATELLITE MANUFACTURER**  
Airbus Defence and Space  
[www.airbusdefenceandspace.com](http://www.airbusdefenceandspace.com)

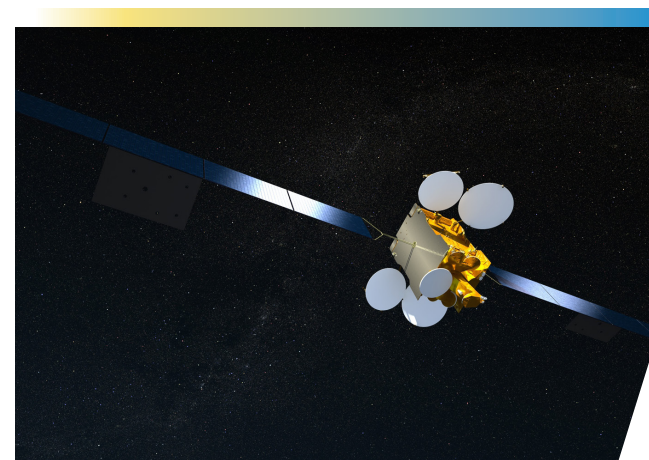
**PLATFORM**  
Eurostar E3000

**SEPARATED MASS**  
6,002 ±20 kg

**SATELLITE MISSION LIFETIME**  
15 Years

## SATMED

SATMED, an e-health platform conceived by SES and supported by the Luxembourg Government and the Ministry for Cooperation and Humanitarian Action is a satellite based communication solution aimed to improve public health in emerging and developing countries.



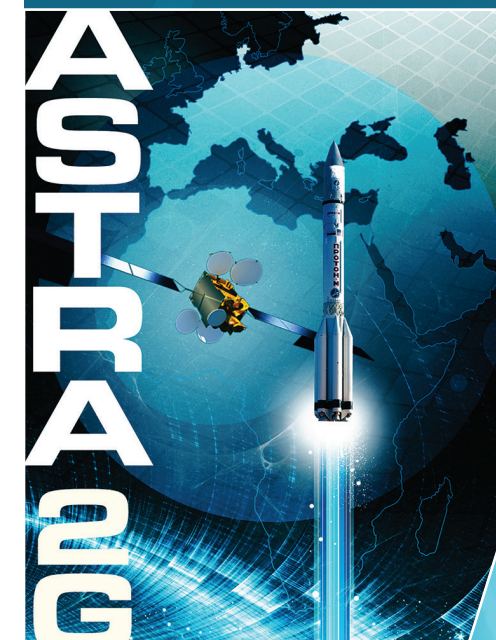
### SATELLITE MISSION

ASTRA 2G is the third spacecraft of a three satellite investment programme (ASTRA 2E, 2F and 2G) that SES contracted with Airbus Defence and Space in order to provide replacement as well as incremental satellite capacity in the orbital arc of 28.2/28.5 degrees East. ASTRA 2G carries 62 Ku-band transponders as well as 4 Ka-band transponders. The different beams provide coverage over the UK and Ireland, Europe and West Africa.

**SES**

**AIRBUS**  
DEFENCE & SPACE

## Mission Overview



- 2<sup>nd</sup> ILS Proton Launch in 2014
- 86<sup>th</sup> ILS Proton Launch Overall
- 24<sup>th</sup> SES Satellite Launched on ILS Proton
- 18<sup>th</sup> Airbus DS Satellite Launched on ILS Proton

## Astra 2G

