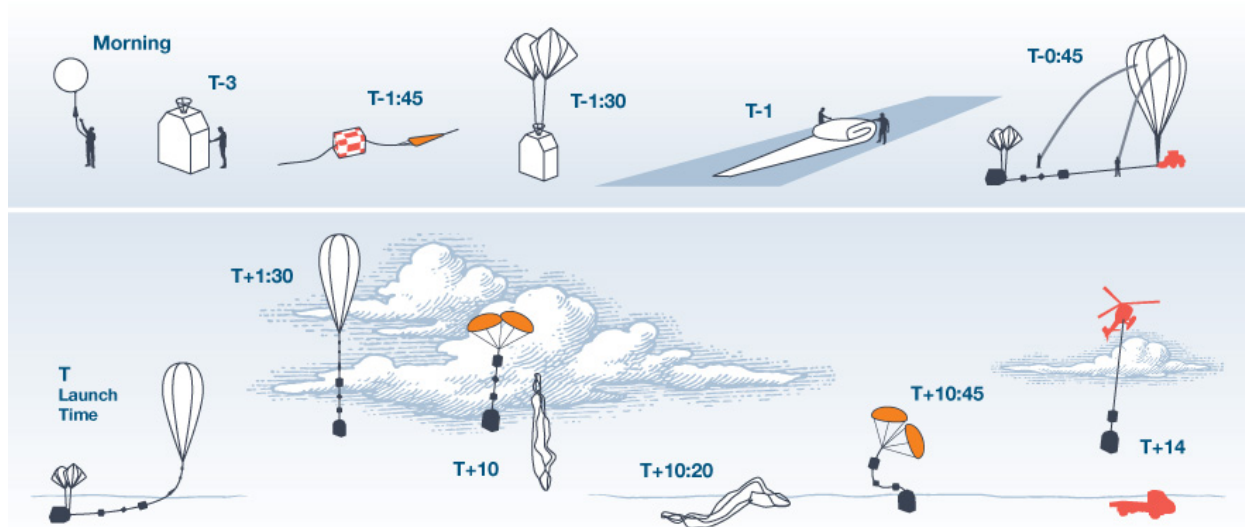


A Typical Stratospheric Balloon Launch

The following steps describe the typical sequence of an open stratospheric balloon (BSO) flight. BSOs can, however, make short- or medium-duration flights. The length of the missions can also be influenced by the type of balloon used and the weather conditions.



Morning of the Launch Day

Weather conditions are evaluated. If conditions are favorable, it continues; if not, conditions are reassessed later in the day or the release is postponed to the next day.

T -3:00

The launch team take up their positions. The final validation tests on the avionic gondola and the scientific gondola are completed in the integration room. The auxiliary balloons used to hold the gondola during the release phase are filled with helium.

T -1:45

The avionic gondola is transported to the launch area. It is then integrated with the remaining elements of the flight chain for final testing and check-out.

T -1:30

The scientific gondola is transferred to the launch area: The gondola, which can weigh up to 1,100 kg (2,425 lbs), is assembled under the auxiliary balloons. Radio frequency link tests, between the gondola and the mission control center, can take place during flight configuration activities.

T -1:00

The main balloon is unfolded. The envelope is placed on a long protective mat. The operators, donning gloves, handle the balloon carefully as it is very fragile.

Credit: *Canadian Space Agency*

T – 00:45

The balloon is inflated by two operators who fill it with helium. This can take 15 to 45 minutes.

Time 0

Release. The main balloon (BSO) is released and rises into the sky. Its ascent and flight path are monitored by the pilots in the control room using various instruments including the GPS and the transponders installed on the flight chain's gondolas. The balloon rises at a speed of approximately 5 meters per second (16.4 feet per second). Once the balloon starts its ascent, the auxiliary balloons are separated from the gondola.

T +1:30

The balloon reaches the given ceiling for the flight. It can climb up to an altitude of 42 km (26 miles). When the ceiling is reached, the collection of scientific data begins.

T +10:00

The scientific mission ends. In the operations room, a suitable landing site is identified, in compliance with Safety and Mission Assurances (S&MA) rules. Air traffic control centers are notified and give clearance for the descending balloon to cross lower altitude airspace, used by commercial aviation, in a safe manner. Recovery teams move close to the landing site selected to secure the area. The order is given by the ground (remotely) to separate the flight chain and the envelope. Both sections (flight chain attached to a parachute and envelope in freefall) are monitored in real time to the ground.

T +10:20

The envelope lands first after a free fall descent at a speed of about 20 meters per second (66 feet per second). The recovery team folds up the envelope to return it to the launch site. +

T +10:45

The flight chain lands, typically in a remote area located within a radius of 10 km (6 miles) from the envelope. The recovery team secures the landing area of the flight chain. The electronic boxes are disconnected by ground crews who then request a helicopter to lift and carry heavy balloon components to a truck waiting on a road nearby.

T +14:00

Repatriation: The truck is loaded with the balloon components and then returns them to the base.