



The balloon envelope is filled with hydrogen gas. Since the gas is lighter than air, this provides the “lift” for the sport balloon. When filled the envelope can lift the weight of the balloon, pilots and gear. Once filling on the ground is complete, the pilots cannot add more hydrogen in flight. The teams will conserve hydrogen gas for the duration of the flight. As a result, they try to release as little gas as possible.

During the day when the sun heats the envelope, the gas expands and gains lift, carrying the balloon higher. Because the envelope is open at the bottom, gas naturally escapes as the balloon climbs in altitude. If a

descent is needed to continue traveling with changing airflows, or for landing, the pilots can release gas by pulling a rope that opens a valve at the top of the balloon. At night, the gas cools and contracts, causing the balloon to lose lift. The pilots counteract this by getting rid of weight, like sand and water.

The pilots “steer” by going up and down to find winds at different altitudes that take them in the direction they wish to go. In a race like the Gordon Bennett, they are looking for winds which will allow them to gain the greatest distance while remaining clear of bad weather. But they try to limit the amount of maneuvering to ascend and descent to preserve gas and ballast.

Pilots use the hydrogen gas and ballast as the “fuel” for the flight. If they can conserve gas and ballast, they can potentially stay aloft and travel farther.

When they are ready to land, they release gas to lose lift and ballast sand to slow their descent. They also carry a long, heavy rope, called a drop line, which helps to slow the balloon and its descent as it drags on the ground. Once the balloon is on the ground, they open the valve and deflation ports to release the gas from the balloon. As with hot air balloons, a chase crew retrieves the balloon and pilots for the long trip home.