

# A Hot Air Balloon Ride



For some people a hot air balloon ride can be categorized as a thrill, a frightening experience (those who have a fear of heights) or maybe something on one's bucket list. In any case it is a marvelous way to take to the air and get a bird's eye view of the ground below.

According to the History of Balloons, there is no known direct evidence regarding manned hot air balloon flights prior to the 18<sup>th</sup> century. The Chinese were using unmanned hot air balloons during the 3<sup>rd</sup> century for military signaling by flying lanterns. It was not until the late 18<sup>th</sup> century that the first flight with passengers took place. On September 19, 1783, the Montgolfier brothers Joseph-Michel and Jacques-Etienne launched a balloon with a sheep, duck and a rooster near Versailles, France. The balloon was called Aerostat Reveillon. It went to the height of 853 feet and landed safely.

On October 19, 1783, the first people went into the air. This flight, however, was tethered to ensure safety. One month later, the first free-flight with people took place. Following that, other flights took place. Early balloons used hydrogen to get them a loft. It became a problem; in fact, it caused the first aviation disaster when a balloon crashed in Tullamore, Ireland and caused 100 houses to be set on fire.

Balloons were used for military observation purposes during several battles. During World Wars I and II, barrage balloons with steel cables anchored to the ground were used to prevent low-flying enemy aircraft from doing surprise bombing and hitting a target with more accuracy. Nearly 3,000 barrage hydrogen balloons, some at heights of 5,000 feet, were used to protect London and other communities during World War II. They were not small balloons, averaging 62 feet long and 26 feet wide. Managing these balloons was not easy, and lightening was an issue. The worldwar-two.net noted that 100 V1 rockets were snagged by the balloon cables, thus saving lives and property.

This photo program will not deal with either helium or hydrogen balloons. It is the simpler flying machine that uses hot air to propel occupants into the sky that will be the focus.

The basic parts of a hot air balloon are the basket, propane tanks, instrumentation, stainless steel burner, skirt or throat, reinforced nylon panels and gores, envelope or balloon, parachute valve, and parachute valve cord. The basket holds the pilot and passengers, propane tanks and other items. The basket is made from either a wicker of woven fibers or synthetic resins or rattan, a strong tropical fibrous plant. Size of the basket determines the number of passengers.

Instrumentation most often includes an altimeter, variometer (rate of climb), thermometer and GPS. The make-up of the balloon has three parts. Panels or gores are made of nylon that are sectioned to make it strong and not rip in flight. The throat or skirt which is at the base of the envelope or balloon is designed to absorb the heat from the burner into the envelope or balloon. A parachute valve and valve chord control the pressure in the balloon and can be used to vent air to cause the balloon to rotate and/or lose air.

Today balloonists use a powerful gas run fan to inflate the envelope before the burner is used near the end of the start-up to upright the basket and board passengers. While the envelope is being inflated, the pilot or an assistant in the chase vehicle must get any folds out of the envelope. The basket is on its side and until the balloon is upright, no passengers may be onboard.

Once into the sky, the pilot must pay attention to wind changes, since some can make the balloon go backwards. Constant check and watching for powerlines and trees are a necessity. Landing is another issue. One may find the basket has to be landed on a slope, rather than a flat surface. Coordinating with the ground crew is important to make a successful landing.

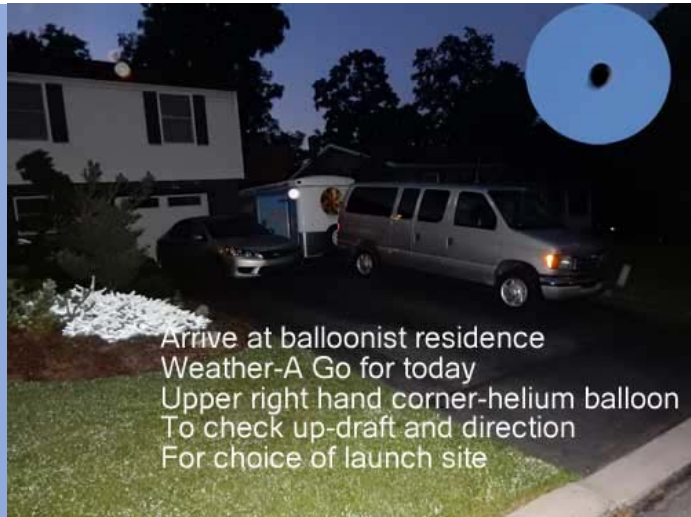
Pilots as well as the equipment of hot air balloons must be certified. This means both the pilot and equipment must meet FAA (Federal Aviation Administration) standards and codes. Balloon pilots must have a pilot's license or airman's certificate. There is a minimum age limit and completion of a required number of hours of training depending on whether you will be a private or commercial balloonist. Other requirements include ascending to a specified altitude, number of solo flights and passing a written and practical test by a designated FAA officer. Today, there are an estimated 6,000 balloonists in the United States.

The FAA requires collection and analysis of weather data, selection of launch sites, emergency procedures, providing for maneuvers and communicating with local airports. Landowner relations, packing and fueling safety are

also part of the FAA rules. Riders must sign a Hot Air Balloon Agreement to Participate/Waiver of Responsibility before take off. This is an assumption of risk; an example is in the sources below.

A pilot's crew usually consists of a chase vehicle that has radio capabilities. The costs of training to be a private or commercial pilot can run from \$3,000 or \$7,000 to be certified. New balloons can cost between \$20,000 to \$45,000. Balloons with special shaped designs range from \$120,000 to \$140,000. A four-passenger basket with roles, inflation fan, trailer, burner, gloves and other gear could cost over \$10,000. Balloonists have insurance costs, inspection costs, maintenance costs. A new balloon may last from 250-500 flying hours before repair or replacement is necessary. So, your hot air balloon ride will probably not be a cheap one, but the thrill can really be worth it.

This photo program flight flew over The Pennsylvania State University in State College, Pennsylvania.





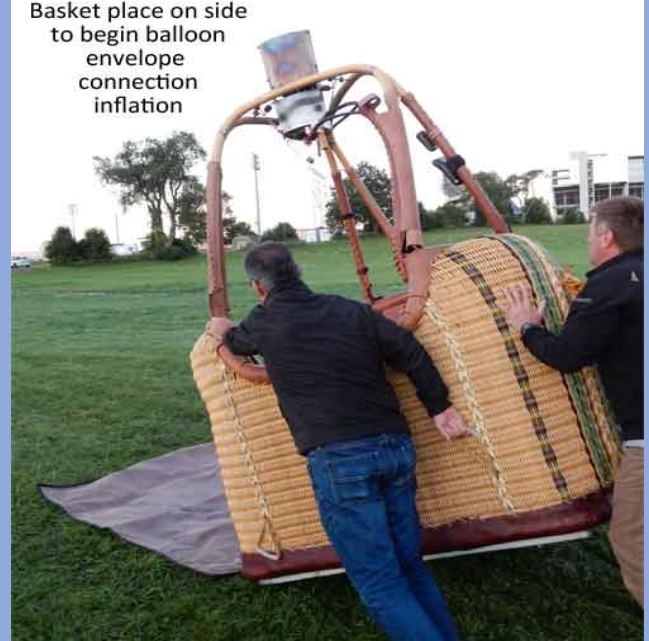
Balloon is unloaded, van is driven to release from bag



Burner Attachment



Basket place on side to begin balloon envelope connection inflation



Balloon is in place  
Fan is ready to inflate it





During the fanning process, one of the crew must release any folds that are on the balloon, set the parachute valve and its cord



Final stage, use the burner to inflate the balloon & upright the basket











Thank you  
for sharing  
the ride!



Balloon notes

Basket to top of balloon=70 feet

Balloon width=55 feet

4 tanks of gas

We were at 1,400 feet

Pilot can control  
up and down  
NOT direction

Pilots must be  
Certified

Basket can hold 6 people

Nylon balloon must be  
Certified

Use of Kevlar ropes

French first to  
fly October 1783

Must have permission to land

Farmers do not like balloon  
due to animals being frightened



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Sources: <http://www.historyofballoons.com/balloon-history/ballooning-history/>, <http://www.eballoon.org/history/history-of-ballooning.html>, <https://www.space.com/16595-montgolfiers-first-balloon-flight.html>, <http://www.fun-flying.com/become-a-pilot.htm>, [https://www.faa.gov/aircraft/air\\_cert/design\\_approvals/balloons/balloons\\_regs/](https://www.faa.gov/aircraft/air_cert/design_approvals/balloons/balloons_regs/), <https://www.quora.com/How-many-people-fit-in-a-hot-air-balloon>, <https://www.brisbanehotairballooning.com.au/hot-air-balloon-accidents/>, <https://www.shermanstravel.com/advice/8-things-you-need-to-know-about-hot-air-balloon-rides/>, <https://www.explainthatstuff.com/how-hot-air-balloons-work.html>, <https://www.virginballoonflights.co.uk/science-of-hot-air-ballooning/>, <http://www.hotairflight.com/how-much-does-a-hot-air-balloon-cost/>, <https://www.patioproducts.com/blog/fascinating-stuff/wicker-vs-rattan/>, <http://www.whatitcosts.com/hot-air-balloon-cost-prices/>, <http://www.hotairballoon.org/vermont/faq.html>, <https://www.soaringsports.com/ballooning-info/how-balloons-work/>, [https://wwwcache.wral.com/asset/entertainment/out\\_and\\_about/2015/05/13/14642877/1431977978-waiver\\_and\\_release\\_of\\_liability\\_fbf\\_5-8-15.pdf](https://wwwcache.wral.com/asset/entertainment/out_and_about/2015/05/13/14642877/1431977978-waiver_and_release_of_liability_fbf_5-8-15.pdf), and "The Sky's the Limit Ballooning, Inc." [www.paballoonrides.com](http://www.paballoonrides.com).