

# VIRGIN GALACTIC ROLLS OUT 'UNITY,' ITS FIRST NEW SPACE PLANE SINCE 2014 CRASH

News / Manufacturer



## Virgin Galactic is getting ready to fly again.

Sixteen months after a fatal accident sidelined the private spaceflight company, Virgin Galactic presented its new and improved space plane designed to bring paying space tourists into suborbital space and back home again.

Virgin Galactic's new SpaceShipTwo, named Unity because of an idea from cosmologist Stephen Hawking, rolled out in the company's hangar at the Mojave Air and Spaceport as ticket holders, press and VIPs looked on.

In true Virgin Galactic style, the new SpaceShipTwo was hidden behind a curtain for much of the hour-long program, until a Land Rover tugged the ship into the hangar as Sir Richard Branson stood out of the car's sunroof.

The ship was then christened with a bottle of milk by Branson's grand daughter, who turned one year old on Friday.

The event was also tinged with sadness.

The first SpaceShipTwo — named Enterprise and unveiled in 2009 — disintegrated above the

Mojave Desert during a test flight on Oct. 31, 2014, killing one pilot and leaving another hospitalized with serious injuries.

An investigation found that the accident occurred because the “feathering” function on the ship was unlocked too early in flight. SpaceShipTwo’s feathering feature is used to bring the spacecraft back safely after it reaches the top altitude of its flight.

"We would always remember the accident, but we would not be defined by it," Virgin Galactic CEO George Whitesides said during the rollout.

While the design of the new SpaceShipTwo hasn’t changed significantly, engineers have included some specific changes to training in order to make sure the feathering function cannot unlock until it is safe to do so.

By and large, the vehicle looks effectively the same on the inside and out. The company says this will help them retake to the skies faster.

"Because our new vehicle is so similar to its predecessor, we benefit from incredibly useful data from 55 successful test flights as well as the brutal but important lessons from one tragic flight test accident," Virgin Galactic said in a statement.

"And so, we will begin our full vehicle tests by validating and calibrating that existing data set by running tests similar to what you’ve seen before."

Many tests ahead

A ticket to ride on SpaceShipTwo costs \$250,000, and the company has sold about 700 tickets to date. Hawking is the only non-paying customer on the list, and he was invited to the rollout but could not make it, presumably due to health problems.

SpaceShipTwo has been built to be lofted 50,000 feet into the air by its WhiteKnightTwo carrier aircraft before it’s released. Once it drops from the carrier ship, the space plane’s rocket motor is designed to kick on, bringing it to a top altitude of about 100 kilometers, 62 miles, eventually.

During the flight, the six passengers on the space plane will be able to float out of their seats as the two pilots move the plane to give the tourists a good view of the planet against the blackness of space as they experience weightlessness. The space plane will then make a landing back on a runway.

But Virgin Galactic has a long testing process ahead of it before any passengers reach the edge of space.

SpaceShipTwo and WhiteKnightTwo will fly together for the first few tests, with the space plane remaining mated to the carrier aircraft the entire time. Then, the company will move on to glide tests, allowing the space ship to fly freely.

Once those tests are completed, the powered test flights can begin.

"Each mission will be designed to test something important: how the heat from the rocket motor dissipates in the rear of the vehicle, how the vehicle behaves when breaking the sound barrier on both ascent and descent, how closely our models of forces on the vehicle match reality," Virgin Galactic said.

## Transition to an all Virgin Galactic operation

SpaceShipTwo's design is based on SpaceShipOne — the space plane that won the \$10 million Ansari X Prize in 2004 for becoming the first privately built crewed vehicle to fly to an altitude of 100 kilometers twice in two weeks.

That year, Virgin Galactic licensed the technology behind the space plane — built by Scaled Composites — to develop a commercial space tourism vehicle and rolled out the Enterprise in 2009.

Scaled Composites also built and tested the Enterprise for Virgin Galactic, but Virgin — with their manufacturing firm the Spaceship Company — took over the building of Unity, a handover that was planned before the 2014 accident.

Now, Virgin Galactic is on its own for the building and testing of what they hope will become a fleet of space liners.

The transition away from relying on Scaled Composites precipitated a shift in the company's culture as well.

"Now it's 'we're doing it,' and we are fully responsible for everything," William Pomerantz, Virgin Galactic Vice President for Special Projects, told Mashable.

Virgin Galactic isn't the only company aiming to bring paying customers to suborbital space.

Jeff Bezos' company Blue Origin has been testing their New Shepard suborbital space system that is designed to bring private space explorers up to 100 kilometers above Earth before landing back on the planet.

Another private company, XCOR Aerospace, is also planning to one-day fly paying tourists to suborbital space with their space plane in development.

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