
SPACEX:
The Next Great American Adventure

Lifting off from Cape Canaveral: The Next Great American Adventure

As NASA prepares the last space shuttles for their final missions to the International Space Station, an era is drawing to a close. The iconic winged spacecraft that for 30 years have symbolized U.S. dominance in space will soon be retired. But the journey does not stop with Endeavour and Atlantis.

Even before the plumes of the final shuttle flights clear over Launchpad 39A, a new dawn in American spaceflight was rising. Reaching 157-ft skyward, SpaceX's Falcon 9 rocket and Dragon spacecraft stand poised to continue NASA's tradition of exploration, and launch the next great American adventure to the stars.

Embracing the innovation, economics, and national priorities of the 21st century, SpaceX has teamed with NASA to provide breakthrough advances in reliability, cost, and safety to build on the space shuttle's legacy and maintain American leadership in space.

NASA's revolutionary Commercial Orbital Transportation Services (COTS) program and Commercial Crew Development (CCDev) program are paving the way to a new age in U.S. spaceflight, while guaranteeing the Space Station will continue to be the world's premiere orbital research facility.

LEFT: The Falcon 9 launch vehicle lifting off from its Cape Canaveral launch pad carrying the Dragon spacecraft.
RIGHT: The Dragon spacecraft and SpaceX recovery team. Credit: SpaceX/Chris Thompson

A COTS success story, SpaceX's inaugural Dragon spacecraft mission in December 2010 demonstrated the efficiency and innovation that can be accomplished with the fusion of private entrepreneurship and government experience.

For a fraction of the cost of other systems, SpaceX delivers the American taxpayer:

- Reliable access to space
- Exceptional affordability: lowest cost to orbit
- Continued American leadership in space
- Secured U.S. access to the International Space Station
- The only spacecraft capable of returning cargo from space following the retirement of the space shuttle

With America relying on commercial space transportation providers to fly crew and cargo to low-Earth orbit, billions of dollars will be freed up for other activities such as accelerating human exploration of the Solar System, advanced telescopes and Earth science missions.

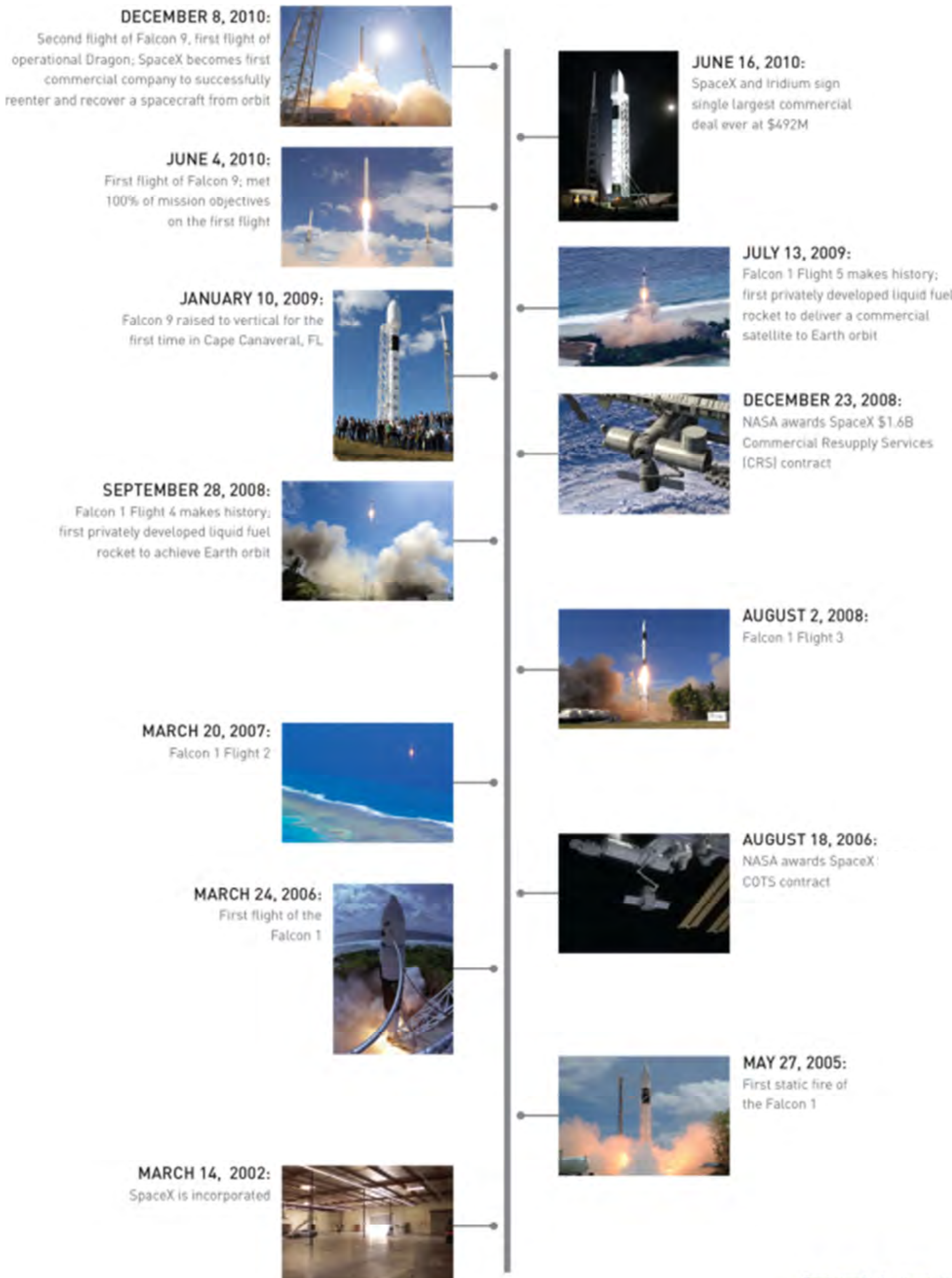
And this is just the beginning.

As NASA and SpaceX prepare to fly the final COTS demonstration later this year, America is redefining what's possible in orbit, and beyond. The dream continues.

SpaceX Key Milestones

"We're really at the dawn of a new era. The government will continue to play a significant role in the future. But I think what you're really seeing is the rise of commercial and in many ways a partnership with government."

Elon Musk, SpaceX CEO and CTO



Commercial Orbital Transportation Services (COTS) Overview

NASA's COTS program is the first of its kind: a "pay for performance" partnership between the government and private business. NASA structured the COTS program as collaboration with the commercial space industry, sharing the risks, costs, and rewards of developing new space transportation capabilities.

Under the program, NASA provides seed money for the development of private spaceflight capabilities, but issues payment only after a company meets technical performance milestones.

SpaceX received a COTS award in 2006 and has since accomplished 25 of 29 COTS milestones receiving $298 million for its progress in developing the Falcon 9 rocket and Dragon spacecraft. The final COTS flight later this year will culminate in SpaceX delivering cargo to the International Space Station and returning cargo safely to Earth.

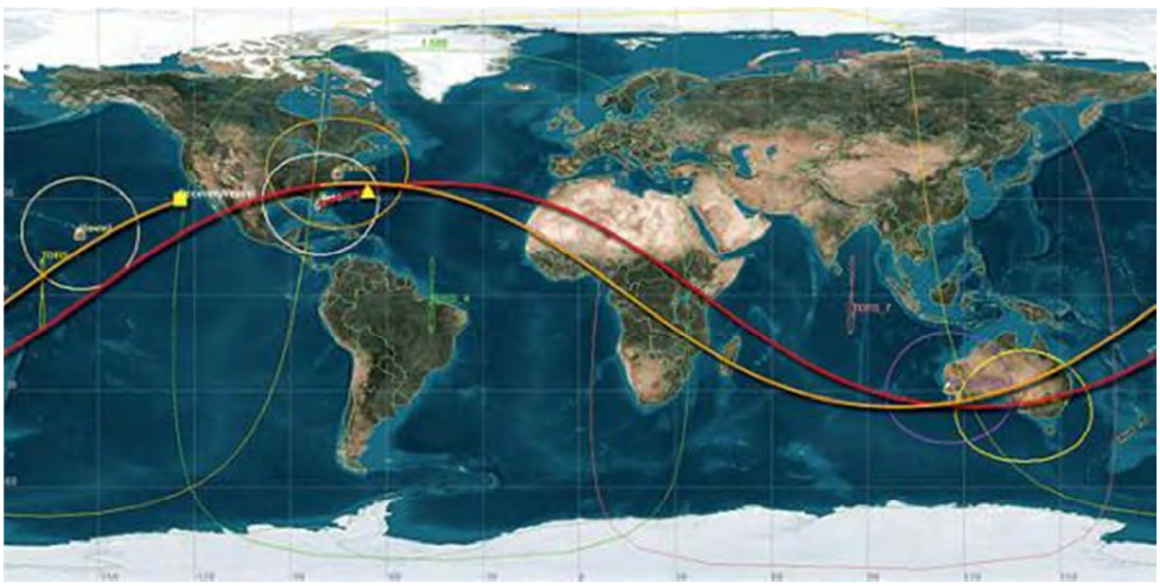


Image above illustrates COTS Demo 1 mission orbital path. The yellow triangle over the Atlantic ocean marks Dragon's initial separation from Falcon 9, and the yellow square off the Western coast of the United States marks where Dragon landed.

Upon completion of the final COTS demonstration flight, SpaceX will begin flights to carry cargo to and from the ISS as part of the Commercial Resupply Services (CRS) contract for NASA awarded in 2008. Under the CRS contract, SpaceX will deliver pressurized and unpressurized cargo to the ISS, including plants and animals, and return cargo to Earth. SpaceX will provide the necessary services, test hardware and software, and mission-specific elements to integrate cargo with the Dragon delivery capsule.

In selecting SpaceX for CRS missions, NASA cited the following significant SpaceX strengths:

- First-stage engine-out capability
- Dual redundant avionics system
- Structural safety factor in excess of industry standards
- Enhanced schedule efficiencies
- Reduced overall technical risk to ISS cargo supply

The $1.6 billion contract represents a minimum of 12 flights, with an option to order additional missions for up to $3.1 billion.

Making History: SpaceX Is the First Commercial Company To Recover a Spacecraft from Orbit

On December 8, 2010, SpaceX became the first commercial company in history to launch, fly, land and recover a spacecraft from Earth orbit. SpaceX's first COTS demonstration mission blasted off at 10:43 AM EST from Launch Complex 40 at the Cape Canaveral Air Force Station in Florida.

Falcon 9 lofted the Dragon to space where it twice orbited Earth at speeds greater than 7,600 meters per second (17,000 miles per hour), entered the Earth's atmosphere, and splashed down just after 2:00 PM EST in the Pacific Ocean. Launching, orbiting and recovering a spacecraft until now has been a feat accomplished by only six nations or government agencies.

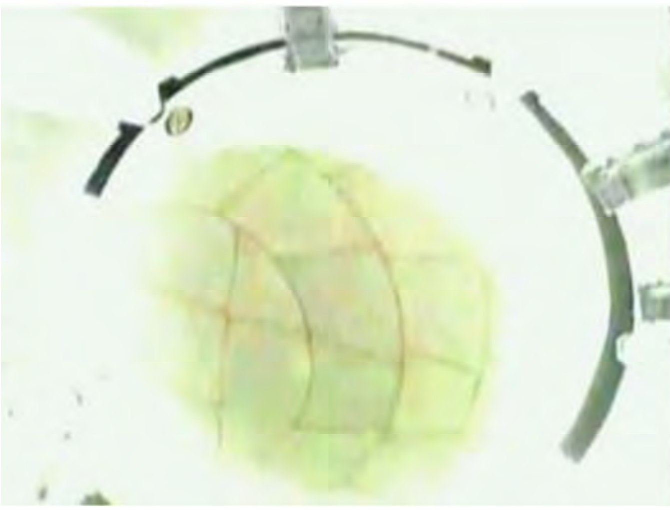
The Dragon spacecraft landed in the Pacific Ocean 3 hours, 19 minutes and 52 seconds after liftoff—less than a minute after SpaceX had predicted and less than one mile from the center of the landing target. Credit: SpaceX

The NASA/SpaceX Partnership

A strong government-commercial partnership, COTS enabled SpaceX to progress by building upon the incredible achievements of NASA, receiving expert advice and mentorship throughout the development process.

The teamwork continues to yield innovative accomplishments, including:

PICA-X Heat Shield**:** Experiencing temperatures between 3,000 and 4,000 degrees Fahrenheit when entering the Earth's atmosphere, SpaceX's Dragon spacecraft requires a robust thermal protection system.To keep the vehicle interior at room temperature, SpaceX worked closely with NASA to develop PICA-X, a SpaceX variant of NASA's phenolic impregnated carbon ablator (PICA) heat shield that was used on NASA's Stardust sample capsule. Stardust reentered the Earth's atmosphere at record-breaking speeds of 28,900 miles per hour.

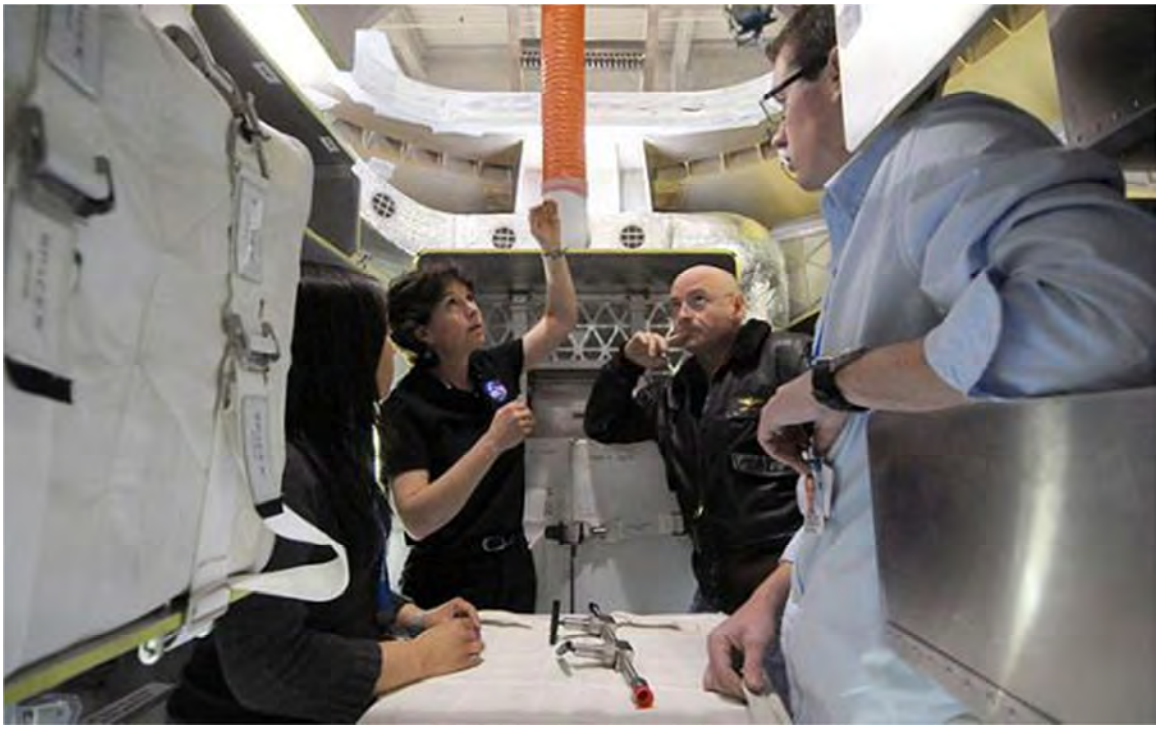


LEFT: Dragon's PICA-X heat shield (shown in flight) protected the spacecraft during reentry from temperatures reaching more than 3,000 degrees F. RIGHT: SpaceX engineers working on PICA-X heat shield, a SpaceX variant of NASA's original PICA formula. Credit: SpaceX/Roger Gilbertson

NASA made its expertise and use of specialized facilities available to SpaceX as the company designed, developed and qualified the 3.6 meter PICA-X shield in less than 4 years at a fraction of the cost NASA had budgeted for the effort. The result is the most advanced heat shield ever to fly, it can potentially be used dozens of times for reentry from Earth orbit with only minor degradation each time (like an extreme version of a Formula 1 racing car's carbon brake pads) and can even withstand the much higher heat of reentry from of a moon or Mars mission.

Astronaut Training**:** In preparation for ISS resupply missions, SpaceX has trained 25 NASA, Japanese, Canadian Space Agency and European Space Agency astronauts and 12 NASA astronaut candidates. During the training, astronauts become familiar with the vehicle and how it operates, getting hands on instruction in everything from how to approach the ISS in Dragon to how to handle cargo and move around in the spacecraft.

The astronauts have a chance to discuss the spacecraft with the Dragon operations team and engineers, and, in turn, provide SpaceX with valuable feedback about the spacecraft.

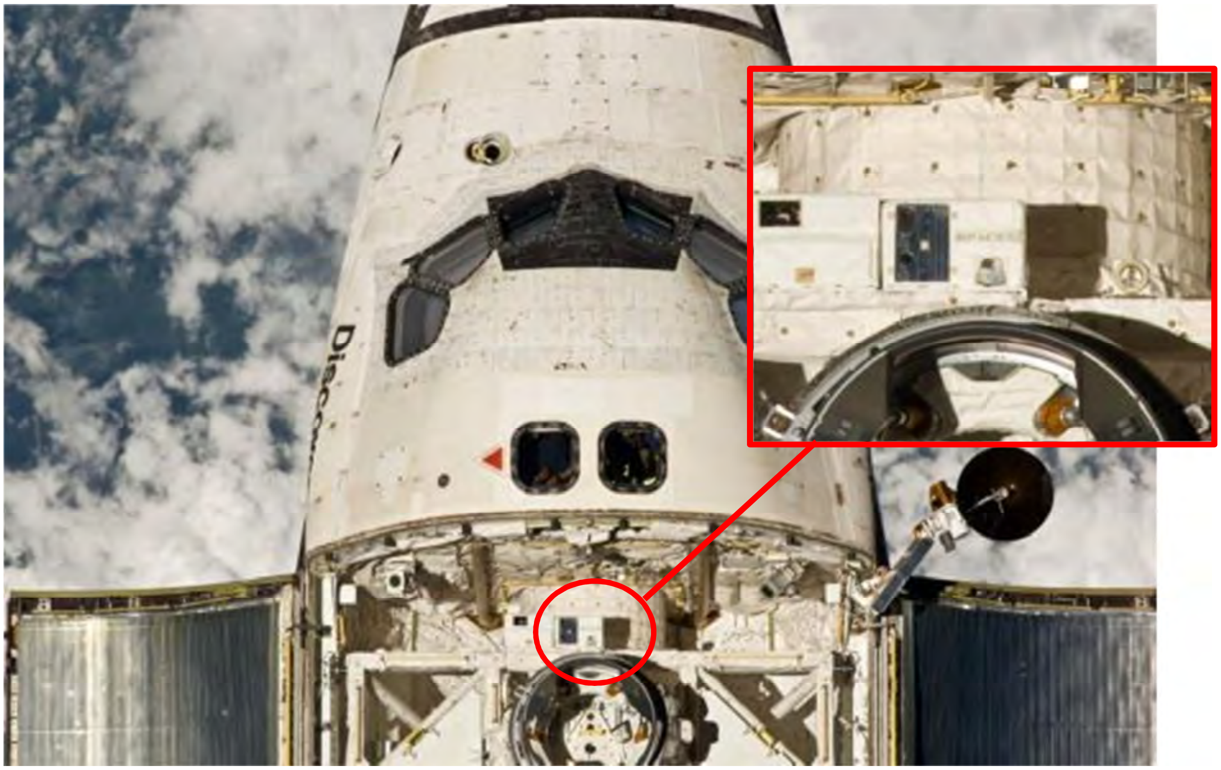


Even when outfitted with the full cargo storage system, Dragon has plenty of room. Visiting NASA astronauts Cady Coleman and Scott Kelly discuss spacecraft cargo operations with SpaceX engineers. Credit: SpaceX

STS-129 - COTS UHF Communication Unit (CUCU) Demonstration: Developed by SpaceX, in collaboration with NASA, the COTS UHF communication unit allows communication between the ISS, SpaceX's Dragon spacecraft, and ground-based mission control. The system also allows the ISS crew to monitor an approaching or departing Dragon spacecraft. The crew uses the Crew Command Panel to issue commands to Dragon. The development of the CUCU required the collaboration of SpaceX and NASA teams and the integration of SpaceX and NASA hardware. CUCU launched aboard STS-129 and was successfully tested in March 2010, less than one year after SpaceX began designing the unit.

STS -127 and STS-133 - DragonEye Demonstration: NASA's Commercial Crew and Cargo Program Office sponsored the investigation of "DragonEye," a pulsed laser navigation sensor that SpaceX's Dragon vehicle will use to approach the ISS. Launched and tested aboard STS-127, DragonEye was mounted to the shuttle's existing trajectory control system carrier assembly on the orbiter docking system. SpaceX and NASA gathered data used to assess DragonEye's performance. A thermal imager was also included to provide context for the LIDAR demonstration and as a precursor to the use of thermal imagery during Dragon's approach to the ISS.

DragonEye2, launched and tested aboard STS-133, was upgraded from the version that flew aboard STS-127 with a LIDAR and thermal imager and a GPS receiver to gather data for ISS approaches.


DragonEye-2 launched into space aboard the space shuttle Discovery on STS-133. Credit: NASA

<u>Launch and Recovery Operations:</u>
The Falcon 9 and Dragon COTS missions require coordination between SpaceX and NASA. During launch, NASA's long-range tracking cameras follow Falcon 9 maintaining a visual on the vehicle through stage separation and second-stage ignition. SpaceX also leverages NASA's Tracking and Data Relay Satellite (TDRS) infrastructure for communications.

Positioned for the Future: Carrying Astronauts

In an era when most technology-based products follow a path of ever-increasing capability and reliability while reducing costs, launch services today are little changed from those of 40 years ago. But SpaceX is changing this by delivering increased reliability and performance of space transportation, while ultimately reducing costs.

Partnered with NASA for cargo missions, the Falcon 9 and Dragon spacecraft were designed from the outset to one day carry astronauts; both the COTS and CRS missions will yield valuable flight experience toward this goal.

The SpaceX/NASA partnership successes to date have confirmed what SpaceX has always believed—the responsiveness and ingenuity of the private sector, combined with the guidance and support of the US government, can deliver the next great American adventure; a spaceflight program that is achievable, sustainable and affordable. SpaceX's services, coupled with NASA's exploration vision, will round out a dynamic national space program that speaks to the American taxpayer, and explorer.

Commercial Crew Development

On April 18, 2011, NASA awarded SpaceX $75 million to develop a revolutionary launch escape system that will enable the company's Dragon spacecraft to carry astronauts.

Artists image of the Dragon spacecraft in orbit. Credit: SpaceX

The Congressionally mandated award is part of the agency's Commercial Crew Development (CCDev) initiative that started in 2009 to help private companies mature concepts and technologies for human spaceflight.

This award will accelerate SpaceX's efforts to develop the next-generation rockets and spacecraft for human transportation. With NASA's support, SpaceX will be ready to fly its first manned mission in 2014.

The flight-proven Falcon 9 launch vehicle and Dragon spacecraft represent the safest and fastest path to American crew transportation capability. With their historic successful flight, many Falcon 9 and Dragon components needed to transport humans to low-Earth orbit have already been demonstrated in flight. Both vehicles were designed from the outset to fly people.

The United States has a critical need for American commercial human spaceflight. After the space shuttle retires in a few months, NASA will be totally dependent on the Russian Soyuz to ferry astronauts to and from the International Space Station (ISS) at a cost of $63 million per seat.

Dragon -- designed to carry seven astronauts at a time to the Space Station at a cost of $20 million a seat -- offers a far better deal for the U.S. taxpayer. While considerable flight testing remains, one major development item Dragon needs for carrying humans to orbit is the launch escape system.

Artists image of the newly proposed launch escape system for the Dragon. The new launch abort system provides crew with emergency escape capabilitythroughout the entire flight and returns with the spacecraft, allowing for easy reuse and radical reductions in the cost ofspace transport. Credit: SpaceX

SpaceX's integrated escape system will be superior to traditional solid rocket tractor escape towers used by other vehicles in the past. Due to their extreme weight, tractor systems are jettisoned within minutes of liftoff to improve performance as the rocket climbs through the atmosphere, but the SpaceX innovative design builds the escape engines into the side walls of Dragon, eliminating the danger of releasing a heavy solid rocket escape tower after launch. The integrated abort system will also provide a way to escape from the second stage of the booster throughout the climb to orbit, while allowing Dragon to carry more weight to orbit than if a tower-based system was used.

The SpaceX design also provides crew with emergency escape capability throughout the entire flight, whereas the space shuttle has no escape system. The result is that astronauts flying on Dragon will be considerably safer.

The integrated escape system returns with the spacecraft, allowing for easy reuse and radical reductions in the cost of space transport. Over time, the same escape thrusters will also provide the capability for Dragon to land almost anywhere on Earth or another planet with pinpoint accuracy.

Under the CCDev award, SpaceX will modify Dragon to accommodate crew, with specific milestones that will provide NASA with regular, demonstrated progress.

SpaceX | Falcon 9 Overview

Evolved from design to first launch in just 4 years and 7 months for about $300 million, Falcon 9 successfully launched on June 4th, 2010. Six months later, in December 2010, Falcon 9 carried the Dragon spacecraft to orbit on the first demonstration flight for NASA's COTS program, and achieved 100 percent of mission objectives.

The Falcon 9 launch vehicle carrying the Dragon spacecraft, climbing from the launch pad. Credit: SpaceX/Chris Thompson

Falcon 9 is a two-stage launch vehicle powered by liquid oxygen and rocket-grade kerosene (RP-1). It was designed from the ground up by SpaceX for the reliable and cost-efficient transport of satellites to low Earth orbit and geosynchronous transfer orbit, and for sending SpaceX's Dragon spacecraft, including manned missions, to orbiting destinations such as the International Space Station.

Reliability

Most launch failures can be attributed to three causes: engine, stage separation and, to a much lesser degree, avionics failures. Falcon 9 addresses the top two problems by having only two stages and nine Merlin engines clustered together to make up the first stage. The vehicle is capable of sustaining an engine failure and still successfully completing its mission. SpaceX's nine-engine architecture is an improved version of the architecture employed by the Saturn V and Saturn I rockets of the Apollo program, which had flawless flight records despite losing engines on a number of missions.

SpaceX uses a hold-before-release system — a capability required by commercial airplanes, but not implemented on many launch vehicles. After the first-stage engine ignites, the Falcon 9 is held down and not released for flight until all propulsion and vehicle systems are confirmed to be operating nominally. An automatic safe shut-down occurs and propellant is unloaded if any issues are detected.

First Stage

Falcon 9 tank walls and domes are made from an aluminum lithium alloy. SpaceX uses an all friction -stir welded tank, made with the most reliable welding technique available and featuring the highest strength welds possible. Nine SpaceX regeneratively cooled Merlin engines power the Falcon 9 first stage. After ignition of the first stage engines, the Falcon 9 is held down and not released for flight until all propulsion and vehicle systems are confirmed to be operating nominally. The interstage, which connects the upper and lower stages for Falcon 9, is a carbon fiber aluminum core composite structure that uses pneumatic pushers for a separation system.

Second Stage

The second-stage tank of Falcon 9 is simply a shorter version of the first-stage tank and uses most of the same tooling, material and manufacturing techniques. This results in significant cost savings in vehicle production. A single Merlin engine powers the Falcon 9 upper stage with an expansion ratio of 117:1 and a nominal burn time of 345 seconds. For added reliability of restart, the engine has dual redundant pyrophoric igniters.

Merlin Engine

The Merlin engine was developed internally at SpaceX, but draws upon a long heritage of space-proven engines. The pintle-style injector at the heart of Merlin was first used in the Apollo Moon program for the lunar module landing engine, vital to one of the most critical phases of the mission.

Propellant is fed via a single-shaft, dual- impeller turbo-pump operating on a gas generator cycle. The turbo-pump also provides the high pressure kerosene for the hydraulic actuators, which then recycles into the low pressure inlet. Thisdesign eliminates the need for a separate hydraulic power system and means that thrust vector control failure by running out of hydraulic fluid is not possible.

A third use of the turbo-pump is to provide roll control by actuating the turbine exhaust nozzle (on the second-stage engine). Combining the above three functions into one device that is verified as functioning before the vehicle is allowed to lift off means a significant improvement in system-level reliability.

<u>1st Stage Engines</u>

Sea Level Thrust :	556 kN (125,000 lbf)
Vacuum Thrust:	617 kN (138,800 lbf)
Sea Level Isp:	275 s

<u>2nd Stage Vacuum Engines</u>

Vacuum Isp:	304 s

With a vacuum specific impulse of 304s, Merlin is the highest performing American hydrocarbon rocket engine ever flown.

SpaceX | Dragon Overview

Dragon is a free-flying, reusable spacecraft developed by SpaceX under NASA's Commercial Orbital Transportation Services (COTS) program. Evolved from design to first mission in 4 years and 3 months for about $300 million, the Dragon spacecraft is made up of a pressurized capsule and unpressurized trunk used for Earth to LEO transport of pressurized cargo, unpressurized cargo, and/or crew members.

The Dragon spacecraft after its 50,000 mile mission, pictured here with the SpaceX recovery team, rests in its cradle for the 500 mile ride back to Los Angeles. Credit: SpaceX

Dragon Highlights:

- Fully autonomous rendezvous and docking with manual override in crewed configuration
- Capable of carrying over 3 metric tons in each of the pressurized and unpressurized sections.
- Payload Volume: 10 m3 (245 ft3) pressurized and 14 m3 (490 ft3) unpressurized available for payloads
- Supports passengers in crew configuration
- Two-fault tolerant avionics system with extensive heritage
- Reaction control system with 18 MMH/NTO (monomethylhydrazine/nitrogen hydroxide) thrusters designed and built in-house; these thrusters are used for both attitude control and orbital maneuvering
- Integral common berthing mechanism, with low-impact docking system (LIDS) or androgynous peripheral attach system (APAS) support if required
- Lifting re-entry for landing precision and low-g's

SpaceX |Company Overview

Recently ranked as one of the world's 50 top innovative companies by MIT's Technology Review, SpaceX operates on the philosophy that simplicity, reliability and low-cost can go hand-in-hand.

By eliminating the traditional layers of management internally, and sub-contractors externally, SpaceX reduces costs while speeding decision making and delivery. By manufacturing the vast majority of our vehicles in-house, we keep tighter control of quality, reduce costs, and ensure a tight feedback loop between the design and manufacturing teams. And by focusing on simple, proven designs with a primary focus on reliability, we reduce the costs associated with complex systems.

With the Falcon 9 rocket, SpaceX has a diverse manifest of missions to deliver commercial and government satellites to orbit. This includes a $492 million contract with Iridium, the single largest commercial launch deal ever signed, and a contract with SES, one of the largest satellite operators in the world, to deliver a satellite to geostationary orbit.

Founded in 2002, SpaceX is a private company owned by management and employees, with minority investments from Founders Fund, Draper Fisher Jurvetson, and Valor Equity Partners. The company has nearly 1,300 employees in California, Texas and Florida. For more information, and to watch the video of the most recent Falcon 9 launch, visit the SpaceX website at SpaceX.com.


LEFT: Vehicles are designed and manufactured at SpaceX headquarters, a 550,000-square-foot facility in Hawthorne, CA that is home to mission control. RIGHT: Testing happens at a 600-acre state-of-the-art propulsion and structural test facility in McGregor, TX. Credit: SpaceX

SPACEX

SpaceX | Space Launch Complex 40, Cape Canaveral Air Force Station

The Falcon 9 launch site at Space Launch Complex 40 (SLC-40), on Cape Canaveral Air Force Station (CCAFS), is located on the Atlantic coast of Florida, approximately 5.5 km (3.5 miles) southeast of NASA's space shuttle launch site.

Starting in 1965, SLC-40 saw the launch of 55 Titan III and Titan IV rockets, including the 1997 launch of NASA's Cassini spacecraft, now orbiting Saturn. The Titan rockets were among the largest vehicles in the U.S. fleet – second only to the giant Saturn V moon rocket.

The last Titan IV launch from SLC-40 occurred in April of 2005. SpaceX, Cape Canaveral's first purely commercial launch program, began demolition of the old site in November of 2007 and started upgrading and renovating the complex for Falcon 9 launches in May 2008.

In just over 24 months from initial occupancy of the pad, SpaceX was able to completely renovate the pad using a small crew and successfully launched its inaugural Falcon 9 booster on June 4th 2010. With plans to launch 10 to 12 missions per year in support of the Space Station resupply and commercial satellite customers, SpaceX is building on the strong heritage of Space Launch Complex 40.

In just over 24 months from initial occupancy of the pad, SpaceX was able to completely renovate the pad using a small crew and successfully launch its inaugural Falcon 9 booster on June 4th 2011, and six months later its first COTS demonstration mission.

Moving forward, SpaceX has plans to improve the Falcon 9 booster with the addition of the upgraded Merlin1D engine as well as improvements to the launch pad and Cape launch infrastructure to increase throughput and enable a significant ramp up in launch rates.

Elon Musk – CEO and CTO

Elon Musk founded SpaceX in 2002 and serves as both Chief Executive Officer and Chief Technology Officer. Musk served as chief engineer for Falcon 1, the first privately developed liquid-fueled rocket to reach orbit, and both the Falcon 9 and Dragon spacecraft.

Musk is also CEO and Product Architect of Tesla Motors, where he oversees product development and design, including design of the all-electric Tesla Roadster and Model S sedan. He is the non-executive chairman of SolarCity, the leading provider of solar power systems in California.

Before founding SpaceX, Musk co-founded PayPal, the world's leading electronic payment system, and served as the company's chairman and CEO. PayPal went public in early 2002 and was sold to eBay later that year. Musk's first company was an Internet software company called Zip2. He co-founded Zip2 in 1995, serving initially as CEO and then as CTO. Zip2 was sold to Compaq in 1999.

Musk earned two degrees from the University of Pennsylvania—one in physics and another in business from the Wharton School. He currently serves as a member of the Stanford University Engineering Advisory Board and is a trustee of Caltech, the X Prize Foundation, and the Musk Foundation.

Gwynne Shotwell – President

Gwynne Shotwell is President of SpaceX, responsible for day-to-day operations and for managing all customer and strategic relations to support company growth. She joined SpaceX in 2002 as Vice President of Business Development and built the Falcon vehicle family manifest to over 40 launches, representing over $3 billion in revenue. Shotwell is a member of the SpaceX Board of Directors.

Prior to joining SpaceX, Shotwell spent more than 10 years at the Aerospace Corporation. There she held positions in Space Systems Engineering & Technology as well as Project Management. She was promoted to the role of Chief Engineer of an MLV-class satellite program, managed a landmark study for the Federal Aviation Administration on commercial space transportation, and completed an extensive analysis of space policy for NASA's future investment in space transportation. Shotwell was subsequently recruited to be Director of Microcosm's Space Systems Division, where she served on the executive committee and directed corporate business development.

In 2004, she was elected to the California Space Authority Board of Directors and currently serves on its executive committee. She has also served as an officer of the AIAA Space Systems Technical Committee. Shotwell participates in a variety of STEM (Science, Engineering, Technology, and Mathematics)-related programs, including the Frank J. Redd Scholarship Competition; under her leadership the scholarship committee raised over $350,000 in scholarships in four years. Shotwell received, with honors, her Bachelor's and Master's Degrees from Northwestern University in Mechanical Engineering and Applied Mathematics. She has authored dozens of papers on a variety of subjects including standardizing spacecraft/payload interfaces, conceptual small spacecraft design, infrared signature target modeling, shuttle integration, and reentry vehicle operational risks.

Ken Bowersox – Vice President, Astronaut Safety and Mission Assurance

Ken Bowersox is a former NASA shuttle commander, now leading SpaceX's Astronaut Safety and Mission Assurance Office as the company prepares to carry astronauts.

Selected to the astronaut corps in 1987, Bowersox has flown five times on NASA's Space shuttle, serving as pilot, commander and mission specialist, and once on a Russian Soyuz. Bowersox has logged over 211 days in space, including 5 ½ months aboard the International Space Station, where he was the mission commander of the 6th expedition.

He rose to the important role of Director of Johnson Space Center's Flight Crew Operations Directorate, responsible for overall planning, direction, and management of flight crew operations and Johnson Space Center aircraft program activities. Immediately before joining SpaceX, he served as an independent aerospace consultant, serving on the NASA standing review boards for the space shuttle, ISS, Constellation, Orion and the Constellation Suit System programs. Bowersox holds a B.S. in Aerospace Engineering from the United States Naval Academy and an M.S. degree in Mechanical Engineering from Columbia University.

Garret Reisman – CCDev 2 Project Manager

Garrett Reisman is responsible for working with NASA to prepare SpaceX's Falcon 9 rocket and Dragon spacecraft to carry astronauts. Reisman's experience as an operator of both American and Russian spaceflight hardware will help SpaceX in the development of human interfaces including controls, displays, seats, suits and environmental control systems.

Reisman came to SpaceX from NASA where he served as an astronaut starting in 1998. He has flown on two space shuttle missions, during which, he logged over 3 months in space including over 21 hours of extravehicular activity (EVA) in 3 spacewalks. Dr. Reisman served with both the Expedition-16 and the Expedition-17 crews as a Flight Engineer aboard the International Space Station.

Reisman holds a B.S. in Economics and a B.S. in Mechanical Engineering and Applied Mechanics from the University of Pennsylvania, an M.S. in Mechanical Engineering from the California Institute of Technology, and a Ph.D. in Mechanical Engineering from the California Institute of Technology. He is an FAA Certified Flight Instructor.

For more information on SpaceX:

Visit Us: www.spacex.com
Like Us: www.facebook.com/SpaceX
Follow Us: www.twitter.com/SpaceXer
Watch Us: www.youtube.com/SpaceXChannel