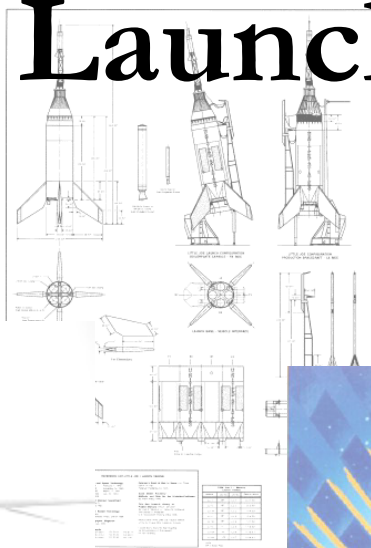
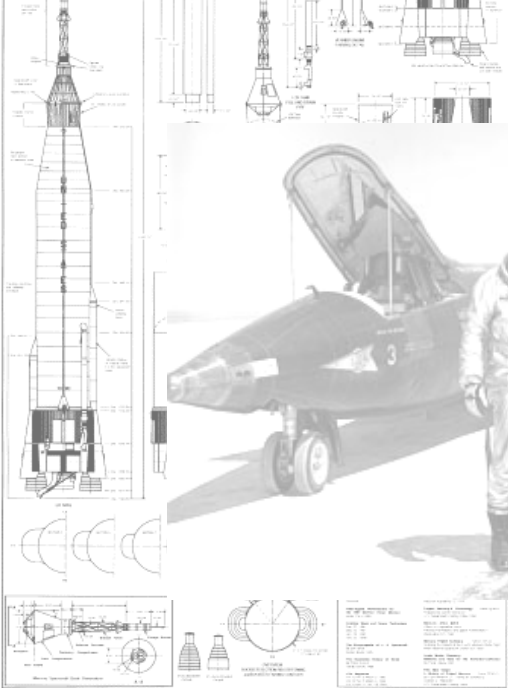
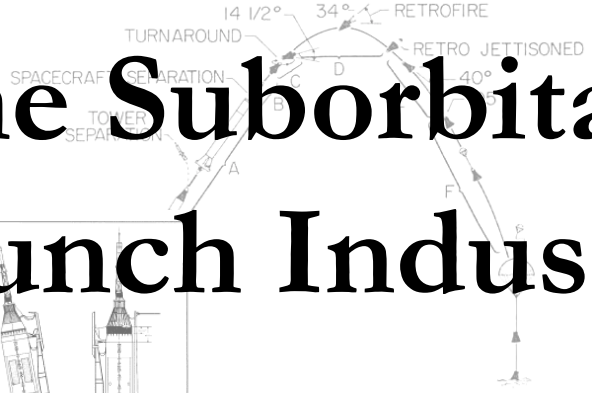


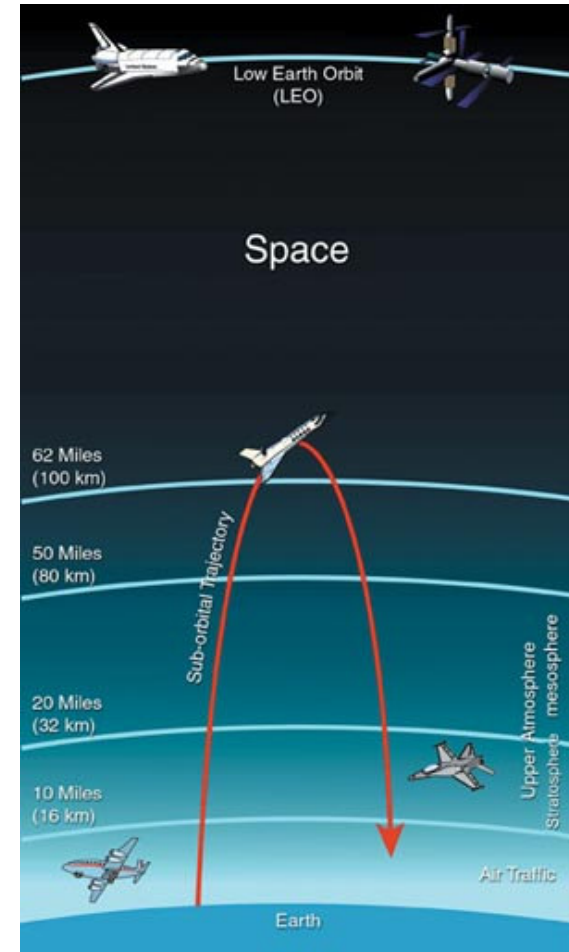


An Introduction to the Suborbital Launch Industry



What Is Suborbital?

- An orbital spacecraft such as the Space Shuttle has to travel fast enough to orbit the Earth without falling back due to gravity, which involves speeds of approximately 25 times the speed of sound.
- The term “suborbital launches” refers to vehicles that travel high enough to reach the “edge” of outer space but do not have the energy to achieve orbit. Typically these vehicles reach a maximum speed of about 2 – 6 times the speed of sound.
- Alan Shepherd was the first American in space by making a similar suborbital flight.



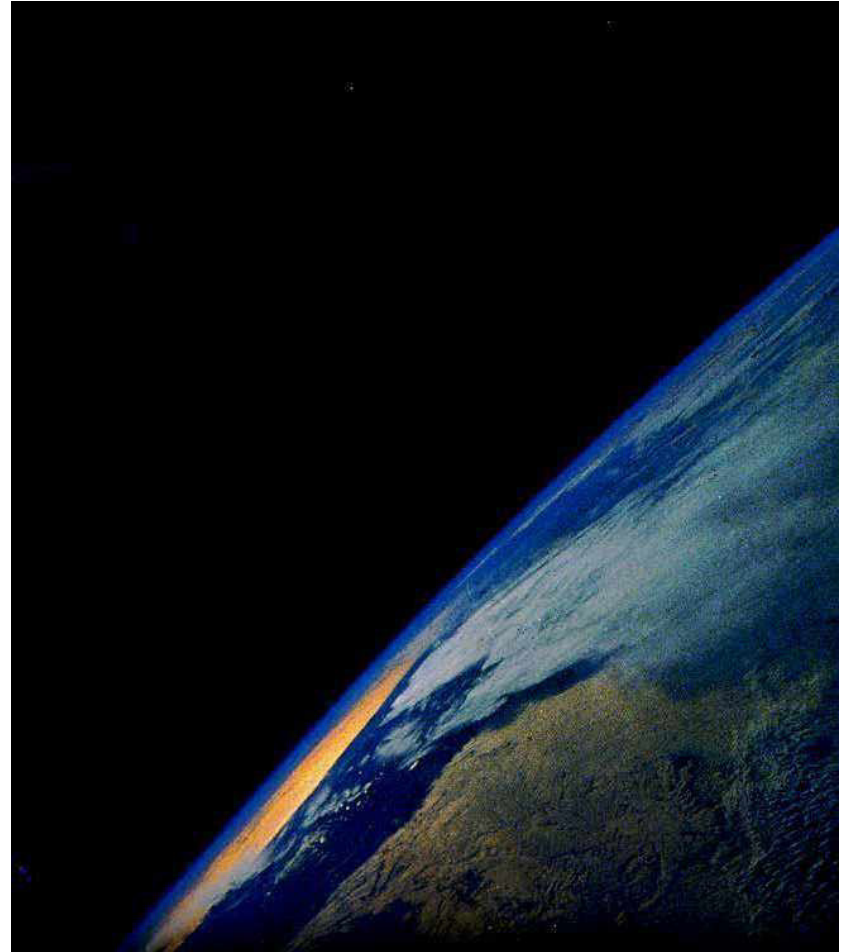
History of Manned Suborbital Launches



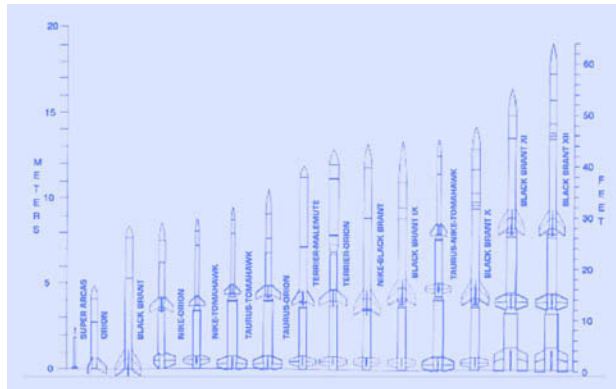
- The Air Force **X-15** debuted in the 1960s and made nearly 200 flights, achieving altitudes in excess of 60 miles.
- The **NF-104** was a F-104 “Starfighter” equipped with a rocket nozzle that enabled it to achieve suborbital altitudes.
- NASA’s **Project Mercury** flew Alan Shepherd to suborbital altitudes.

Why Is Suborbital Important?

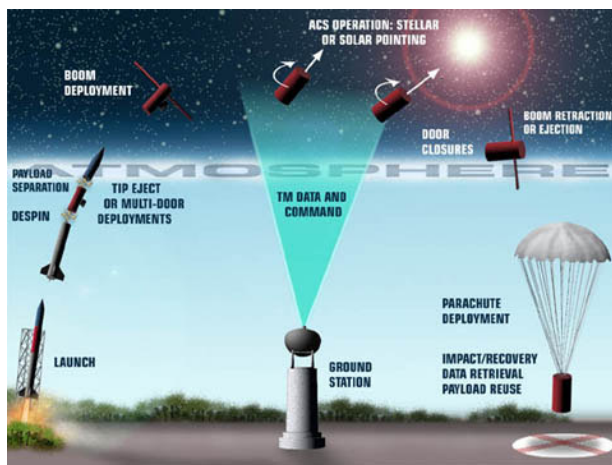
- Commercial Markets
 - Space tourism
 - Commercial imaging
 - Film & television
 - Fast package delivery
- Science
 - Microgravity research
 - Atmospheric research
- National Security
 - Surveillance
 - Verification of experimental systems (such as National Missile Defense)



The Suborbital Launches of Today...

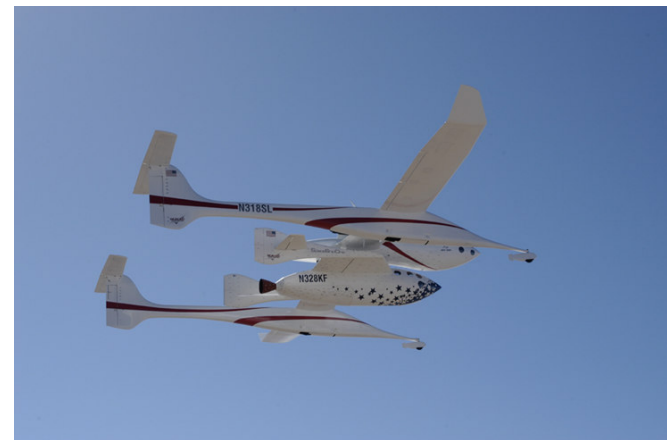


- Suborbital flights occur today as unmanned sounding rockets that carry small scientific payloads requiring brief periods of microgravity or those that make observations at suborbital altitudes...



...and the Suborbital Launches of Tomorrow

- ... but manned suborbital launches offer an entirely new potential for dramatic growth.
- Space Adventures is booking future suborbital flights today.
- More than 20 teams around the world are competing for the X-Prize, a \$10,000,000 prize to jumpstart the space tourism industry through competition between the most talented entrepreneurs and rocket experts in the world.



Is Space Tourism Real?

- Dennis Tito and Mark Shuttleworth's flights to the International Space Station proved there is an emerging market for orbital adventure travel.
- Space Adventures, the company that brokered Tito and Shuttleworth's flights, has been taking reservations for suborbital flights as well and has studied the market for several years.
- A Zogby poll shows that 19% of wealthy Americans (a group that includes about 3 million people) would pay up to \$100,000 for a suborbital flight – this translates into a potential \$57 billion industry.
- Futron Corporation, a leading technology consulting firm, completed a study concluding that space tourism was a real market – if the right vehicles were available.



The Federal Government's Role



- The Commercial Space Launch Act of 1984 as amended (*49 USC 701*) states that the FAA Office of the Associate Administrator for Commercial Space Transportation (AST) has sole regulatory authority over launches of a “suborbital rocket” on a “suborbital trajectory.”
- However, Congress never defined these terms in law, which has led to jurisdictional disputes within the FAA.
- The FAA is also chartered to promote, foster, and enhance the space transportation industry

Given the large number of domestic companies pursuing suborbital launches, and the strong growth potential for this emerging market, it is in the best interest of the United States to encourage and foster this industry.

Recommendations

- To help encourage this industry, we make the following recommendations:
 - Provide a statutory definition for “suborbital rocket” and “suborbital trajectory” to clarify that FAA AST has sole regulatory authority over this industry
 - Develop an innovative, flexible regulatory regime that reflects the unique characteristics and performance of suborbital vehicles while also recognizing the tremendous economic and national security potential for the market
 - Provide assistance to companies in meeting FAA mandated liability insurance requirements
 - Allow FAA AST to issue a launch license for suborbital passengers
- If these key issues are not resolved, it will impede private investment in (and therefore rapid progress by) this nascent industry, and ultimately suborbital launch industries will likely emerge abroad and leave the U.S. with no presence in this market.

For More Information

- **X-Prize Foundation** | Greg Maryniak | (314) 533-2002 | www.xprize.org
- **National Space Society** | Brian Chase | (202) 543-1900 | www.nss.org
- **ProSpace** | Marc Schlather | (703) 522-5559 | www.prospace.org
- **Space Access Society** | Henry Vanderbilt | (602) 431-9283 | www.space-access.org
- **Aerospace States Association** | Tim Huddleston | (256) 782-5972 | www.aerospacestates.us
- **Futron Corporation Space Tourism Market Studies** | www.futron.com
- **Space Adventures** | www.spaceadventures.com
- **XCOR Aerospace** | www.xcor.com
- **Armadillo Aerospace** | www.armadilloaerospace.com
- **Scaled Composites** | www.scaled.com