

What It Takes to Become a Commercial Space Pilot

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- In 2021, five flights were launched by United States' private space companies
SpaceShipTwo (Virgin Galactic) required pilots
- Studies on spaceflights have progressed while bypassing the importance of a pilot
- Pilots onboard make the judgments and modifications at the appropriate times
The red warning light during Virgin Galactic's space flight in 2021



Qualifications & Expertise

U.S. Regulatory Requirements 14 CFR Sec. 460.5(c)

- FAA pilot certificate with an instrument rating
 - *Operation in the National Airspace System*
 - *Crossing Class A airspace*
- Aeronautical knowledge, experience, and skills necessary to fly the spacecraft
Necessary for Safe operations in the NAS

Medical Qualifications 14 CFR Sec. 460.5(e)

- FAA second-class airman medical certificate
- Issued within 12 months prior to launch or reentry
- ❖ The FAA Class I medical criteria are considered to be adequate for a short period of time of a suborbital flight
(Aerospace Medicine Association)

	First Class	Second Class	Third Class
Pilot Certificate			
Airline Transport Pilot	✓	✗	✗
Commercial Pilot	✓	✓	✗
Private Pilot	✓	✓	✓
Recreational Pilot	✓	✓	✓
Sport Pilot	✓	✓	✓

Expertise – Is a private Cessna pilot good to go?

- Commercial airline and fighter jet pilots will be desired
- Well-trained in crew coordination and abnormal and emergency procedures
- Test pilots are best!

Qualifications and skills	Airline pilot	Fighter pilot	U-2 pilot	Test pilot
Instrument rating	×	×	×	×
Class 1 physical	×	×	×	×
G tolerance		×		×
Fast jet		×		×
Pressure suit		×	×	×
Emergency procedure	×	×	×	×
Crew coordination	×			×
Glide landings		×		×

Training Methods

U.S. Regulatory Requirements 14 CFR Sec. 460.5(c) (3)

- FAA requires to receive training tailored to the vehicle and mission for each phase of flight to protect the public
- Train planned and unplanned (emergency) flight conditions
 - Abort scenarios*
 - Emergency operations*
 - Procedures that direct the vehicle away from the public*

Flight Simulator – Quantum3D's image generator
The flight crew should be aware of the following:

- A simulator cannot correctly replicate the suborbital craft's flying characteristics
- A simulator also cannot simulate the severe physical forces experienced by the pilot



G forces in two directions – ENASTAR'S STS-400
x-axis (against the chest)
z-axis (from the top of the head)



ZERO-G Experience – Space Adventure's B727-200
20–30 s of weightlessness

Suborbital Flight Training – Black Sky Training
Company awarded by the FAA for safe space training

Estimated Training Periods

- Suborbital Flight Pilots: 3 - 4 mos
- Larry Connor (Axiom-1 mission): 900 hrs in 6 mos

