



X PRIZE Team Summary Sheet

VANGUARD SPACECRAFT



All the information given in this document has been cleared for official release by the X PRIZE Foundation and the Vanguard Spacecraft team. Quotes provided by Vanguard are shown in italics. For more information about or if you have questions about Vanguard, please visit their web site at www.vanguardspace.com.

TEAM OVERVIEW



Team Vanguard is the result of an exhaustive search for bright, talented and dedicated individuals brought together to take the first steps into commercial space travel and to establish safe, reliable and profitable off-world infrastructure.

TEAM LEADER BACKGROUND

Steven McGrath has over five years experience in the construction industry where activities include overseeing construction, inspection, construction management of various private and commercial projects. Mr. McGrath has also founded his own successful computer graphics company specializing in the construction industry. He holds an Associates degree in Applied Science as well as a Bachelor of Architecture degree. Mr. McGrath is currently undergoing self-training in rocketry design and deep space propulsion.



DATA AT-A-GLANCE

TEAM SPECIFICATIONS

- Name: Vanguard Spacecraft
- Leader: Steven McGrath
- Place: Bridgewater Massachusetts, USA
- Registered with X PRIZE: 5 May 2003
- Web: www.vanguardspace.com

VEHICLE SPECIFICATIONS

- Name: Eagle
- Length: 45 meters (148 feet)
- Diameter: 8 meters (27 feet)
- GTOW: 133,000 kilograms (300,000 lb_m)
- Dry Weight: 50,000 kilograms (110,000 lb_m)

- Crew Environment: Pressurized cabin and personal life support equipment
- Payload Capacity: 270 kg
- No. of Engines: 16 (12 liquid, 4 solid)
- Propulsion System: Solid and liquid fuel rocket engines
- Fuel: Hydrazine
- Oxidizer: Nitrogen Tetroxide
- Total Thrust: 1.78 MN (400,000 lb_f)
- Reaction Control System: Cold gas nitrogen

MISSION SPECIFICATIONS

- Ascent Method: Vertical take-off from ground
- Max. Accel. Force on Ascent: 3 Gs
- Alt. at Engine Cut-off: Stage 1: 50 km, Stage 2: 75 km, Stage 3: 100 km
- Time at Engine Cut-off: Stage 1: 1 minute, Stage 2: 3 minutes, Stage 3: 5 minutes
- Max. Speed: 1,300 meters per second (3,000 mph)
- Max. Altitude: 100 km
- Time in Weightless Conditions: 5 minutes
- Reentry Method: Ballistic reentry.
- Accel. Forces on Descent: 9 Gs
- Landing Method: Parachute descent to ground
- Total Duration: 30 minutes
- Landing Distance from Take-off Location: 200km (120 NM)
- Time Between Missions: 7 days





VEHICLE/LAUNCH SYSTEM DESCRIPTION



The Vanguard series launch vehicle consists of two booster stages and spacecraft. The booster stages include fuel tank housing and solid fuel booster housings. Fuel tank housings also allow for the replacement of prepared liquid fuel casings in the same manner as the solid fuel booster housings. The spacecraft contains the personnel/cargo to be delivered into space.

The structure of the Eagle will consist of carbon fiber composite materials with honeycombed core for maximum strength and minimum weight. Guidance and life support systems will be determined with the assistance of the contractors.

PROPULSION SYSTEM

The launch vehicle consists of the booster stages and spacecraft. The booster stages include the fuel tank housings and solid fuel booster housings. Like currently used solid rocket boosters (SRBs), these housings allow specially prepared SRB fuel cores to be installed for each launch. The fuel tank housing also allows for the replacement of liquid fuel casings in the same manner as the SRB housings.

MISSION DESCRIPTION

The Vanguard Eagle follows a traditional vertical take-off and ballistic reentry mission plan.

VEHICLE ASCENT

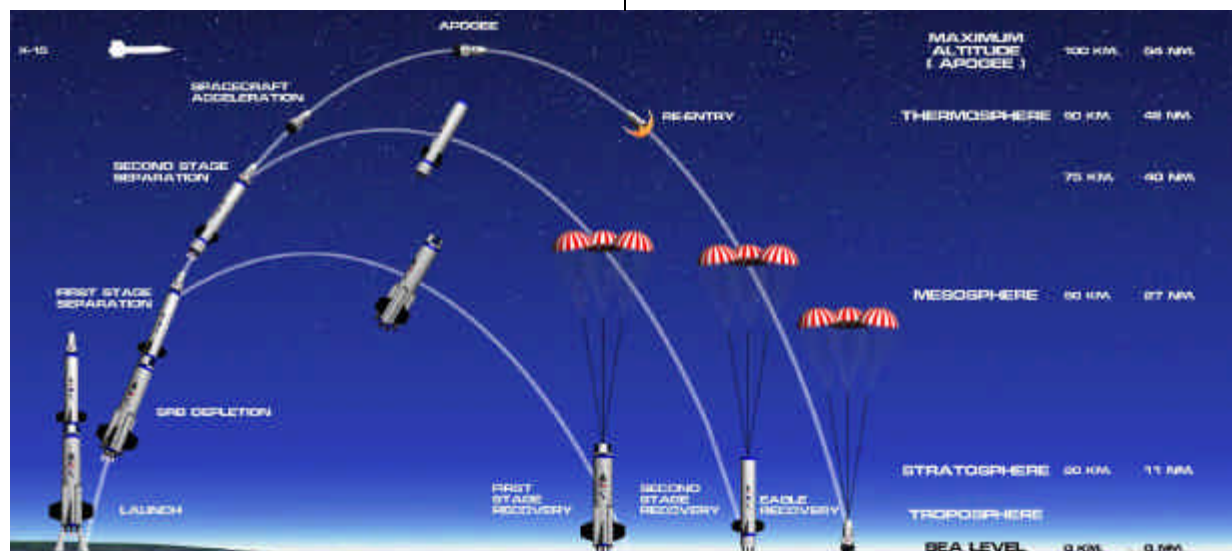
The flight begins with a vertical launch and a crew of four. The first stage will provide the primary lift-off thrust for the first 50 km. The second stage will carry the Eagle to an altitude of about 75 km where the spacecraft will separate. The booster stages return to Earth via parachute.

WEIGHTLESSNESS

After the booster fuel is exhausted, the booster stages separate and the capsule coasts to an altitude of 100 km. At apogee, the crew experiences about five minutes of micro-gravity before a turn-around maneuver for the reentry.

VEHICLE DESCENT AND LANDING

After the attitude thrusters orientate the Eagle capsule for re-entry, with the blunt end of the crew capsule absorbing the heat of re-entry, the capsule is guided on course in a similar fashion as the capsules of the Mercury program. At the appropriate altitude, the drogue and main parachutes deploy for a splashdown and safe recovery of the crew. The booster stages and spacecraft will splash down and be recovered, refurbished then prepared for the next flight.





HARDWARE & TESTS

Small scale model launches have been completed to date, including a successful launch of the Vanguard x1 (Vx1) in Middleboro, MA on 21 September 2002.

There has been no large-scale ground or flight testing of sub-scale or full-scale hardware.

PUBLICITY

PERSONAL APPEARANCES

- None yet disclosed.

TELEVISION AND RADIO

- 30 August 2002 – Bridgewater Local Access TV
- 18 July 2003 Bridgewater Local Access TV

PRINT MEDIA

- None yet disclosed.

TEAM BACKGROUND

TEAM MEMBERS

- Michael Bellino, Consultant/Safety Officer
- Olivier Kozlowski, Legal Services
- Jason Maranhao, Avionics
- Arnold Roquerre, Propulsion
- Susan Youens, Mechanical Engineer

X PRIZE QUOTE

“The X-Prize will at last show the world that we are on the edge of an exciting time in human history. What has for so many centuries been only a dream will soon become a reality, not only for the chosen few but for all who accept the challenges, perils, and rewards that await us in the vastness of space..” – Steve McGrath

PHILOSOPHY

“Vanguard will be a leader in spacecraft design and infrastructure development. Vanguard will have three primary responsibilities: 1.) Four major spacecraft projects will be the focus of spacecraft design and development. 2) Creating public interest through promotions, sponsorships and collaborations and strategic partnerships. 3.) Designing and development of space flight infrastructure such as launch facilities, et al. to

streamline overhead without sacrificing quality and safety.” – Steve McGrath

MISSION AND GOALS

“The 21st century promises the greatest expansion of space exploration and development since the Apollo program of the 1960s and 1970s. With the promise of vast resources and opportunities, Vanguard will be at the forefront of spacecraft, spacecraft systems and infrastructure design. Vanguard’s mission will also include public awareness and promotion of the vast potential of private civilian space travel as well as the potential benefits to individuals and the public at large, to further promote opportunities in off-world commerce, industry and tourism. The general public must be shown that space is not just a government program but also a place where anyone who desires can travel. It is critical that everyone learns of the vast opportunities that await them beyond our own planet.” – Steve McGrath

X PRIZE FOUNDATION

Below is contact information for the X PRIZE Foundation.

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