



X PRIZE Team Summary Sheet

ARMADILLO AEROSPACE



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TEAM OVERVIEW

ArmadilloAerospace™

Leading a small team of dedicated enthusiasts with eclectic backgrounds, John Carmack founded Armadillo Aerospace in 2000. In less than two years, the Armadillo team has accomplished more than some groups have in decades; and each successful achievement leads them to one of their goals. Armadillo Aerospace have set their sites on winning the X-Prize, a prize established to encourage private groups to work towards sending civilians to space. Armadillo Aerospace is located in Mesquite, Texas, USA.

TEAM LEADER BACKGROUND

John Carmack, Co-founder and Chief Technical Engineer of id Software, became well-known for his creations of first-person "shooter" games Wolfenstein 3D (1992), DOOM (1993), and Quake (1996). A long-time rocketry enthusiast, John Carmack has been a regular contributor and supporter of amateur groups working toward sending civilians into space. Frustrated by the slow progress, Carmack decided to jump into the effort himself in his spare time. John Carmack has already established himself one of the most distinguished careers in the world of computer games. His work in the field of Aerospace may win an equal amount of notoriety.



DATA AT-A-GLANCE

TEAM SPECIFICATIONS

- Name: Armadillo Aerospace
- Leader: John Carmack
- Place: Mesquite, Texas, USA
- Registered with X PRIZE: October 2002

- Web: www.armadilloaerospace.com

VEHICLE SPECIFICATIONS

- Name: Black Armadillo
- Length: Not yet disclosed.
- Span: Not yet disclosed.
- GTOW: Not yet disclosed.
- Dry Weight: Not yet disclosed.
- Crew Environment: Not yet disclosed.
- Payload Capacity: Not yet disclosed.
- No. of Engines: Not yet disclosed.
- Propulsion System: Not yet disclosed.
- Fuel: Kerosene
- Oxidizer: Hydrogen peroxide
- Total Thrust: Not yet disclosed.
- Reaction Control System: Not yet disclosed.

MISSION SPECIFICATIONS

- Ascent Method: Vertical ground takeoff with active attitude control.
- Max. Accel. Force on Ascent: 3 g
- Alt. at Engine Cut-off: 100,000 feet
- Time at Engine Cut-off: Not yet disclosed.
- Max. Speed: Not yet disclosed.
- Max. Altitude: Not yet disclosed.
- Time in Weightless Conditions: Not yet disclosed.
- Reentry Method: Ballistic Descent
- Accel. Forces on Descent: 5 g
- Landing Method: Parachute with final attenuation by rocket thrust from a dedicated landing tank.
- Total Duration: Not yet disclosed.
- Landing Distance from Take-off Location: Not yet disclosed.
- Time Between Missions: Not yet disclosed.





VEHICLE/LAUNCH SYSTEM DESCRIPTION



Much technical detail of the Armadillo X PRIZE vehicle is not available because the vision of the vehicle has changed several times in significant ways. Intermediate vehicles remain to be built and test before construction begins on the X PRIZE craft. Lessons learned in the process of building will result in yet more design changes to the final vehicle design.

The design philosophy of the vehicle includes computer controlled vertical takeoff with a minimal amount of mechanical complexity.

PROPULSION SYSTEM

The current plan is to use a pressure fed, bipropellant (hydrogen peroxide and kerosene) rocket engine system.

MISSION DESCRIPTION

The vehicle will be capable of hovering near the ground for systems checkout before throttling up for the full flight.

VEHICLE ASCENT

Initial acceleration is estimated at three g, diminishing as speed builds, and then increasing slightly before burnout at 100,000 feet.

WEIGHTLESSNESS

After burnout, the remaining pressurizing gas in the main tank can be expelled through the engines in a cold gas mode to perform minor vehicle orientation maneuvers while outside the atmosphere.

VEHICLE DESCENT AND LANDING

A small drogue chute will be deployed to insure proper reentry, which will briefly deliver an estimated five g of acceleration. The main chute will be pulled out at a sufficient altitude to deploy a backup chute if necessary.

HARDWARE & TESTS



Armadillo has spent considerable time developing hydrogen peroxide monopropellant rocket engines at their own facility.

More recently, time and research has been spent on bipropellant engines (primarily with hydrogen peroxide and kerosene). Static engine tests of up to 500 psi chamber pressure, 450 lb_f thrust, and 200 sec of specific impulse have already been successfully conducted. Heat sink and regeneratively cooled engines are being researched and tested.

Development of a single-person hovering vehicle is in progress, using the small monopropellant engines developed in-house. Successful manned flights of the 525 lb_f vehicle were conducted in late 2002.

A two-foot diameter "tube rocket" is currently under development which is being used to test the use of rotors for braking and lift-generating purposes.



PUBLICITY

PERSONAL APPEARANCES

- None yet disclosed.

TELEVISION AND RADIO

- None yet disclosed.

PRINT MEDIA

- None yet disclosed.

TEAM BACKGROUND

TEAM MEMBERS

- Russ Blink



- Phil Eaton
- Joseph LaGrave
- Neil Milburn
- Matthew Ross
- Bob Norwood
- Katherine Anna Kang, Business Manager

X PRIZE QUOTE

“The X PRIZE is stimulating the re-examination of a premise that has gone almost unchallenged for decades – that ‘rocket science’ can only be undertaken by governments and corporations with billions of dollars at their disposal. It doesn’t have to be that way, because we have advantages at our disposal today that no government on earth had at the beginning of the space age – the amazing advances in electronics, computerized manufacturing processes, in-place space assets like GPZ and satellite data systems, and, of course, several decades of hindsight. I expect people to remain skeptical, but an existence proof will change the conversation completely.” – John Carmack

PHILOSOPHY

“The appalling inefficiency in the aerospace industry is also a bit of a driving factor. Due to an accident of history tying them to ICBMs, the evolution of space vehicles has wound up tending towards a local optimum that is in a completely different area than better global solutions, and it doesn’t seem likely to break out of the current context. The aerospace industry needs a fresh reboot. There is an order of magnitude improvement available in low hanging fruit.” – John Carmack



MISSION AND GOALS

“The traditional arguments for going to space, like space solar power, asteroid defense, and colonization of the solar system, just don’t sound all that compelling for near term development, and we don’t believe they are going to get us from here to there. It can be a lot simpler. Wouldn’t it be cool to just go? Do we need a better reason? There are enough people that want to go and are willing to pay a good amount of money to justify the endeavor on those grounds alone.” – John Carmack

X PRIZE FOUNDATION

Below is contact information for the X PRIZE Foundation.

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