AIR FORCE X-60A ROCKET VEHICLE LEADS HYPERSONIC FLIGHT RESEARCH

X-60A is an airdropped liquid rocket specifically designed for hypersonic flight research. It features tailorable trajectories at hypersonic speeds and flight conditions.

System Features

The X-60A rocket vehicle propulsion system is a Hadley liquid rocket engine, which utilizes liquid oxygen and kerosene propellants. The system provides affordable and regular access to high dynamic pressure flight conditions spanning from Mach 5 to Mach 8. In addition, altitudes of 70lft – 13kft are achievable.

Artist's rendering of X-60A launch. Image Credit: SpaceWorks Studios, Atlanta, GA

Goals for Future Flights

- Expand envelope
- Validate recovery of vehicle with payload
- Test additional technologies:
  - ◊ Advanced high temperature materials and structures
  - ◊ Scramjet flow path components
  - ◊ Vehicle subsystems
  - ◊ Advanced aerodynamic configurations
- Remove barriers to entry and accelerate space innovation across the industry.

The X-60A has an adjustable front end and flight profile to meet the needs of the particular technology under development.

Program Purpose

AFRL's motivation is to increase the frequency of flight-testing while lowering the cost of maturing hypersonic technologies in relevant flight conditions. While

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hypersonic ground test facilities are vital in technology development, actual hypersonic flight conditions are critical for testing purposes.

Current hypersonic flight research approaches have limited trajectory flexibility and do not support high cadence testing. This vehicle provides launch services that minimize the burden on payload integration. These advancements will leverage New Space commercial development practices.

Activity

December 2017: three captive carry flights completed using an actual vehicle size inert prototype.

June 2018: hot fire test completed using flight-like prototype of the aircraft with integrated propellant feed and propulsion systems.

Up next is the program's Critical Design Review.

Background

Generation Orbit Launch Services, Inc. is developing the X-60A under a contract with the Air Force Research Laboratory, Aerospace Systems Directorate, High Speed Systems Division (AFRL/RQH).

This is the first Air Force Small Business Innovative Research program to receive an experimental "X" designation.

About AFRL

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