

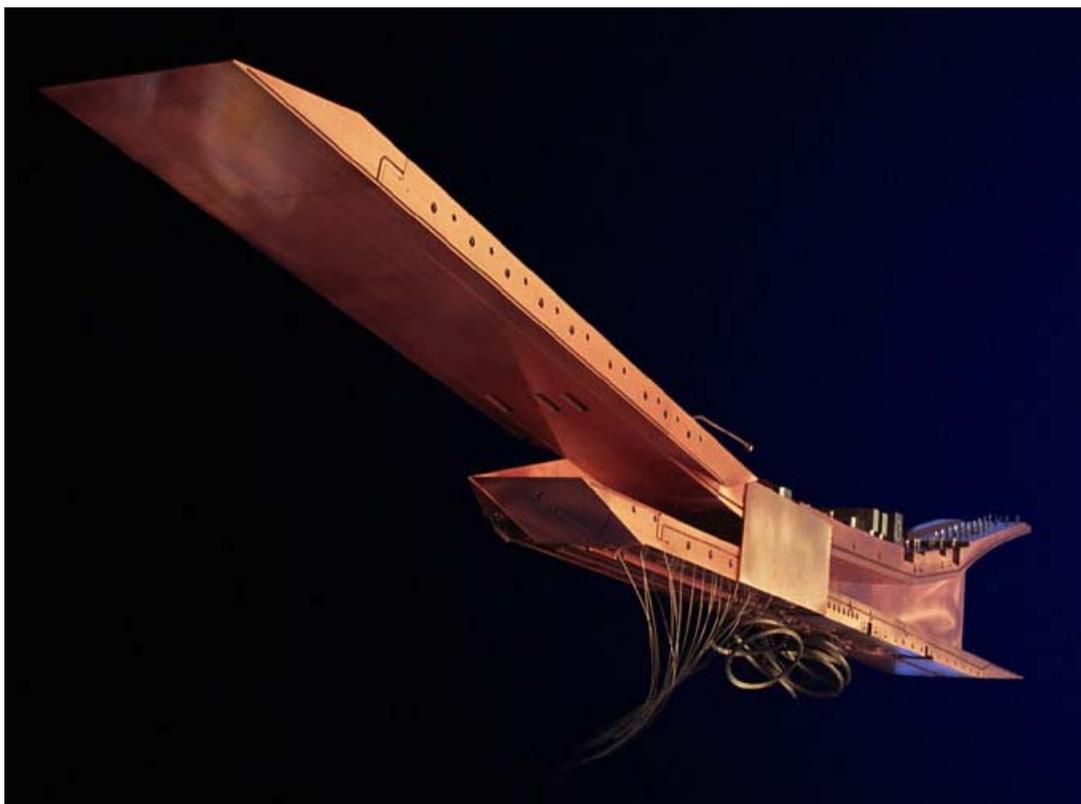


Air Force Research Laboratory | AFRL

Science and Technology for Tomorrow's Aerospace Forces

Success Story

Scramjet Testing Reaches Major Milestone



Payoff

A team of researchers from Air Force and industry achieved a major milestone on the development path to demonstrate a hydrocarbon-fueled, supersonic combustion ramjet, or scramjet, engine. Such propulsive power will enable weapons that will dramatically increase range and decrease the reaction time when employed against high-value targets at long standoff ranges.

Accomplishment

Built under the AFRL's Propulsion Directorate's HyTech program, the Performance Test Engine, or PTE, successfully completed a series of free jet tests at Mach 4.5 and 6.5. The PTE is an integrated engine with inlet, combustor, and nozzle. Pratt & Whitney developed this heavyweight, heat sink demonstrator engine under contract to AFRL. The tests were conducted at the GASL facilities at Ronkonkoma, New York. The PTE met or exceeded performance goals.

The next step and culmination of the HyTech program will be the lightweight Ground Demonstration Engine. This integrated scramjet engine will be fabricated with fuel-cooled

structures that will demonstrate the performance, operation, and structural durability of this flight-type test engine.

Background

The HyTech program is the latest in a long series of Air Force efforts to prove the viability and utility of the supersonic combustion ramjet engine. The program is focused to establish a scramjet technology base with near term applications to hypersonic cruise missiles. This technology base can be expanded to include reusable hypersonic vehicles such as strike/reconnaissance and affordable access to space vehicles.

By maturing scramjet propulsion, researchers will provide a key component to a new breed of propulsion systems known as the combined or combination cycle engines. These combine turbine, ramjet, scramjet and/or rocket engines, using each of the different cycles to the fullest advantage of their respective efficiencies to optimize overall system performance. Such propulsion systems have the potential to enable a family of vehicles, including global range, high speed aircraft, and "spaceplane" type vehicles for on-demand access to space.



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Additional information

To receive more information about this or other activities in Air Force Research Laboratory Propulsion Directorate, contact [Kristen Schario](#), AFRL/PROP, (937)255-3428 and you will be directed to the appropriate Laboratory expert. (PA Case# ASC-01-0838)