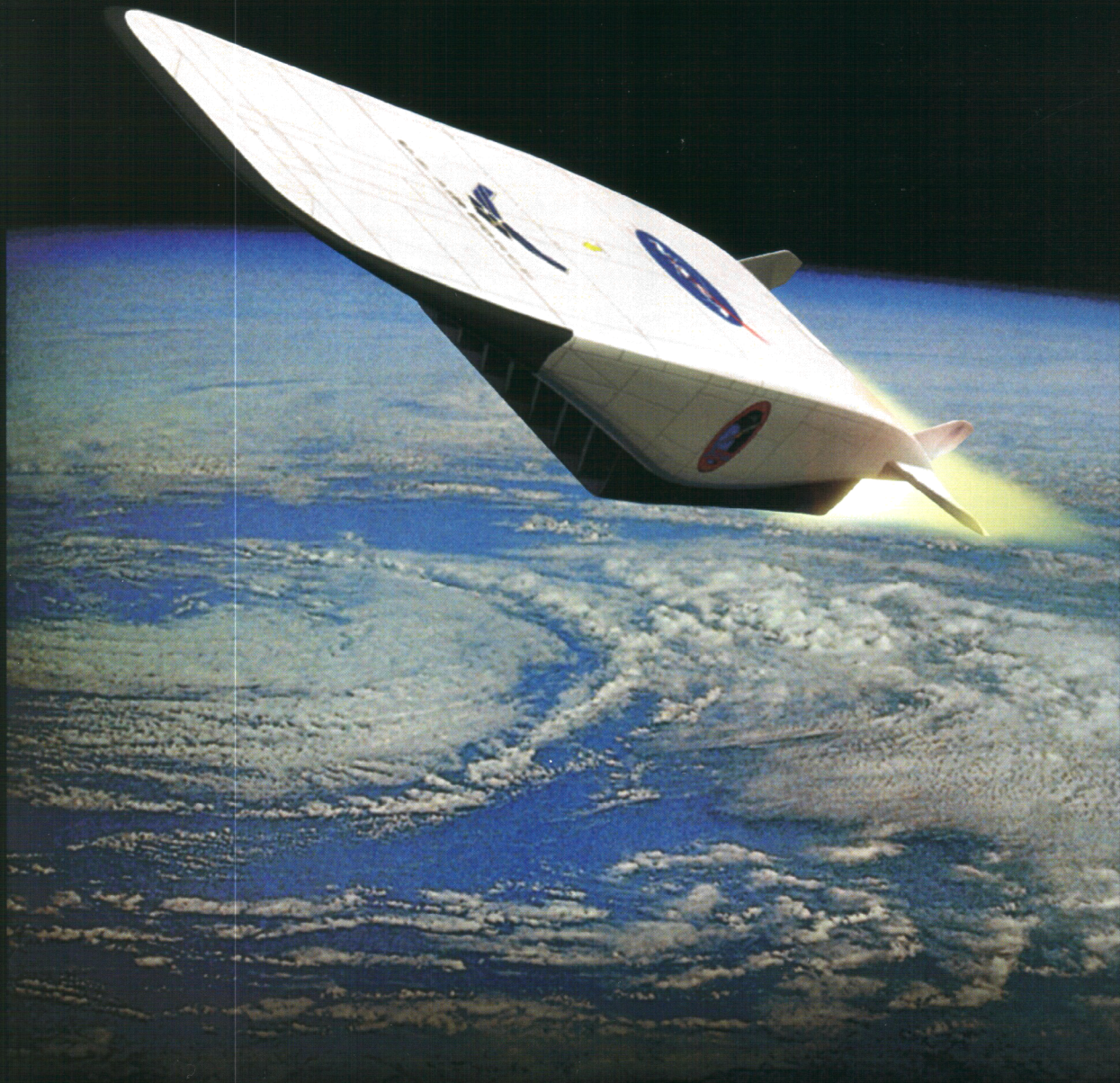


# ISTAR

*Integrated System Test of an Airbreathing Rocket*



**NASA • BOEING • PRATT & WHITNEY • AEROJET**

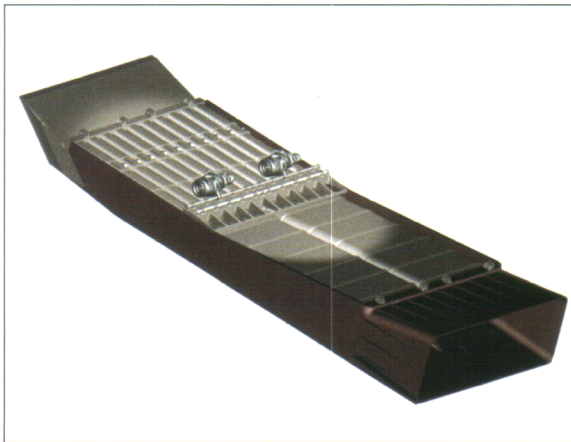
# ISTAR

## *Integrated System Test of an Airbreathing Rocket*

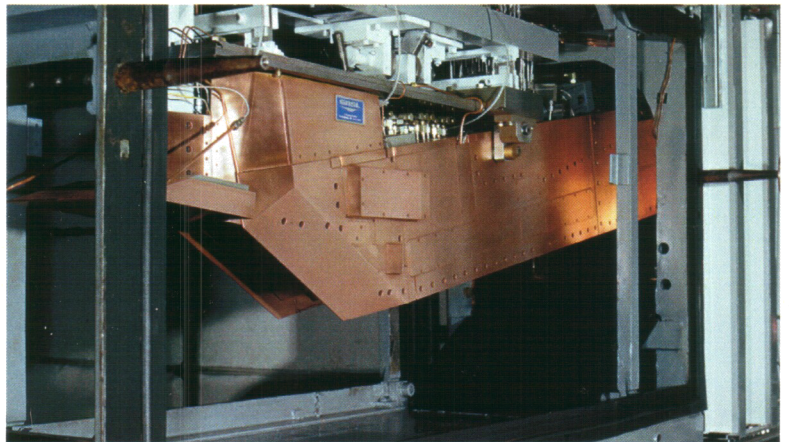
### **Overview:**

NASA Marshall has brought together Government and Industry representatives to conduct a ground test of a Rocket Based Combined Cycle (RBCC) propulsion system. It is envisioned that this hydrocarbon fueled RBCC propulsion system will be used to power a flight test vehicle from launch off a B-52 aircraft up to scramjet speeds of about Mach 7. The propulsion system development and ground test will be conducted as the Integrated System Test of an Airbreathing Rocket (ISTAR) program. The vehicle under consideration for the flight test is a derivative of the current X-43 vehicle which is commonly known as Hyper-X. NASA participation in the program includes the Dryden Flight Test Center, Glenn Research Center, Langley Research Center and Marshall Space Flight Center. Industry representation includes Boeing for vehicle activities and the Boeing Rocketdyne Propulsion & Power business, Gencorp's Aerojet and United Technologies' Pratt & Whitney companies. The propulsion companies have elected to combine their resources and to team for this program. The contractor team has been designated the Rocket Based Combined Cycle Consortium (RBC<sup>3</sup>).

The ISTAR program is currently in a "Jumpstart" phase for development of the engine system leading to ground test of a thermally and power balanced RBCC propulsion system at Stennis Space Center in 2006. A parallel flight test demonstration of this propulsion system is anticipated to lead to first flight in the 2008 timeframe. The goal of the ISTAR Engine Project is to enable a revolutionary step forward in Earth to Orbit propulsion through the design, fabrication, and test of an airframe-integrated, combined cycle engine system. The engine is also envisioned to provide a technology test bed where RBCC engine technologies, and other technologies, can be demonstrated in both a ground and a test flight environment.



*Overall ISTAR Propulsion System*



*ART Freejet Engine*