Office of Aeronautics & Space Transportation Technology (OASTT)

The OASTT directs the agency's aeronautics research and development programs, including the High-Speed Research Program which is creating and refining the technology and addressing the environmental challenges supporting the development of a future U.S. high speed civil transport aircraft.

The Transportation Technology efforts focus on NASA's Reusable Launch Vehicle (RLV) Program, a government/industry partnership aimed at demonstrating single-stage -to-orbit technology required for reducing the cost of access to space. Through DC-XA, X-34 and X-33 demonstration flights, along with additional demonstration programs in flight- and ground-based, results will allow the country to proceed with full-scale commercial programs that will create new opportunities for space access while significantly improving U.S. economic competitiveness in the world-wide marketplace.

The office also researches advanced technology for subsonic aircraft, manages NASA's weather-related flight safety research, works to improve inspection methods for aging aircraft, propulsion research and development of advanced piloting and air traffic control aids. In addition, it directs numerous flight research programs using high-performance aircraft such as the SR-71, F/A-18, and F-16XL. It also manages fundamental aeronautics research in aerodynamics, fluid dynamics, structural mechanic, hypersonics and human factor issues such as the interaction of pilots with highly-automated cockpits.

The (OASTT) has institutional management responsibility for Ames Research Center, Mountain View, CA; Dryden Flight Research Center, Edwards, CA; Langley Research Center, Hampton, VA; and Lewis Research Center, Cleveland, OH.

Airplane Program

The research Airplane Program, an effort by NASA and the Space Administration and the military services, was conceived near the end of World War II to perform flight studies with a series of specially-constructed research aircraft in the then unexplored transonic-low-supersonic characteristics of full-scale aircraft in flight.

Although supersonic flight was first achieved in 1947, further research in the program resulted in increases in knowledge about the dynamics of manned flight in winged aircraft at speeds up to and in excess of 4500 mph and at altitudes up to and greater than 350,000 feet. Two general categories of aircraft were obtained for the research airplane program: (1) those obtained to explore new areas of performance such as the X-1, D-558 I, X-2 AND X-15; and (2) those obtained to investigate the effects of different configurations, such as the X-3, X-4, X-5,XB-70 and the lifting bodies.

The outstanding contributions of this research program include providing important information on previously unexplored aircraft characteristics; validating the transonic-supersonic characteristics predicted by wind-tunnel tests and analytical techniques; and the intangible benefit of providing confidence in the achievement of safe, controllable transonic-supersonic flight.

NACA/NASA X-PLANES

The “X” designation, originally “XS” for experimental Supersonic, applied to a family of experimental aircraft not intended for production beyond a limited number built solely for flight research. The D-558-1 and -2 did not bear the “X” label but were clearly intended for the same purpose. This was also true of the non-X-designated lifting bodies, whereas the XB-70 was originally intended to be a production bomber, and the XF-92A was expected to be a production fighter. Neither of the two latter aircraft actually went into production, and both models became significant research aircraft, hence their inclusion here.