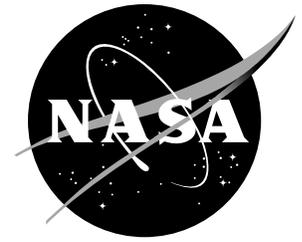


NASA Facts

National Aeronautics and
Space Administration

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Aeronautics

Developing Cutting-Edge Technology to Keep America the World's Leader in Aviation

NASA's aeronautics research is key to U.S. competitiveness in the critical aviation industry. U.S. airlines and aircraft manufacturing firms employ nearly one million people, and their aircraft and engine exports are the major positive contributor to our trade balance. Experts predict that a growth in air travel by the year 2013 will create a demand for an estimated \$1 trillion in new jet transports, and that by 2015, the supersonic aircraft marketplace could be worth as much as \$200 billion in sales and 140,000 jobs.

NASA's aeronautics research and development efforts span the aviation spectrum, from general aviation to jumbo jets, from subsonic to supersonic speeds. The goal: to position U.S. industry to capture the growth markets of the 21st century.

Toward achieving that goal, NASA is working with "Aeronautics Team America"—government, industry and academia—to develop the national strategy and priorities for aviation research and development over the next decade.

Major Programs

- **High Speed Research**—This program is researching and developing technology concepts that help meet economic and environmental demands of a successful supersonic airliner, moving them out of the laboratory toward practical application.
- **Advanced Subsonic Technology**—NASA conducts research in many technical areas related to today's commercial aviation marketplace, such as weather-related safety, aging aircraft, advanced composite technology, fly-by-light/power-by-wire, advanced engine technology, aerodynamics, air traffic control, rotorcraft, and reduced noise and emissions.

- **Critical Technologies**—NASA conducts fundamental aeronautics research in aerodynamics, structures, materials, controls and human factors issues such as the interaction of pilots with highly automated cockpits.
- **High Performance Aircraft**—NASA works closely with industry and the Department of Defense to develop technology for more agile, higher performance aircraft. NASA also conducts flight projects ranging from hypersonics research to development of technology for a next-generation supersonic transport.
- **High Performance Computing and Communications**—NASA will accelerate the development and transfer of high-performance computing technologies to meet the needs of the U.S. aeronautics, and the Earth and space science communities, and to accelerate the implementation of the "*Information Superhighway*." The program aims to provide broad public access to remote sensing data, including Earth and space science data, for general purposes such as education, environmental emergency response and agriculture.

Current Activities

- NASA is collaborating with the National Oceanic and Atmospheric Administration and the National Science Foundation to assess the possible effects of aviation on ozone chemistry and climate. In turn, results of these studies are provided to the Federal Aviation Administration (FAA) and the Environmental Protection Agency, and hence to the International Civil Aviation Organization, for consideration of aircraft engine emission standards. The studies also support related international scientific assessments conducted by the United Nations Environment Programme and the World Meteorological Organization.

Future Activities

- In 1996, NASA will begin test flights using the Russian Tu-144 supersonic civil transport as a flying test-bed for conducting flight research to develop enabling technologies for the High-Speed Research program. The flights will provide aerodynamic, flight environment, structural, and handling qualities data on a supersonic passenger aircraft.
- NASA will begin to fly its recently acquired Boeing 757 on flight research missions at real airports under actual operating conditions. Research will include development of advanced flight deck systems and new ways to integrate control systems on the ground and in the cockpit. The data will help airport and airspace experts plan separation distances between aircraft for maximum safety and efficiency.

Budget

The fiscal year 1995 budget for aeronautics is \$860 million, compared to \$864 million in \$1994.

To accomplish its goals in an era of level or declining budgets, NASA has implemented institutional streamlining budget reductions, which has resulted in a redirection of \$82 million in support of high-priority aeronautics research program such as High-Speed Research, Advanced Subsonic Technology, and High-Performance Computing and Communications.

The FY 1996 budget request for aeronautics is \$911.9 million. This modest increase over the 1995 budget provides for an augmentation in the Advanced Air Traffic Technology and Affordable Design and Manufacturing activities within the Advanced Subsonic Technology program, as well as providing funding for the planned ramp up in the High-Speed Research program.

Beneficial Applications

- NASA and Krautkramer Branson (KB), a subsidiary of Emerson Electric Co., have teamed up to develop

and market a device that will help improve the airworthiness of the nation's aging airplanes. The "Crack Finder" is a handheld instrument designed for rapid scanning of metal surfaces to detect surface-breaking cracks.

- In 1994, Continental Airlines became the first commercial carrier to use the NASA-developed and FAA-certified, predictive wind-shear detection system in passenger service.

"The successful completion of the three-year predictive wind-shear certification process was achieved through a tremendous team effort between NASA, the airline industry, industry suppliers and the FAA," said Fred Abbott, Vice President of Flight Operations for Continental Airlines.

Partnerships

- A jointly sponsored research agreement has been developed with the general aviation industry for cockpit systems, design and manufacturing, propulsion systems and icing protection.
- The Environmental Research Aircraft and Sensor Technology program is a partnership between the unpiloted aerial vehicle industry and government. The partnership will foster commercial applications of these aircraft, address how they can support the government's scientific and military needs, and consider regulatory issues associated with flight operations of these aircraft.
- NASA manages the Aviation Safety Reporting System for the FAA. Aviation incidents reported voluntarily and confidentially by pilots, air traffic controllers and others are combined to form the world's most comprehensive aviation database on human factors (how people and machines interact).
- NASA and Ford Motor Company have signed an agreement for the transfer of NASA-developed technology that will improve the design and engineering of Ford vehicles.