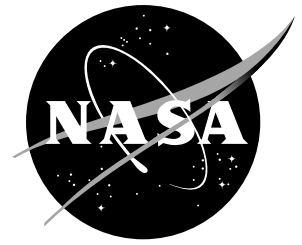


NASA Facts

National Aeronautics and
Space Administration

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FS-1995-08-005-HQ

Space Shuttle

Operating the World's Most Versatile Launch System

The United States developed the Space Shuttle system to improve its access to space. Since the first flight in April 1981, the Shuttle has carried more than 1.5 million pounds of cargo and over 600 major payloads into orbit. The Shuttle is the first and only reusable space vehicle, and is the world's most reliable and versatile launch system. The Shuttle can be configured to carry many different types of equipment, spacecraft and scientific experiments. In addition to transporting people, materials, equipment and spacecraft to orbit, the Shuttle allows astronauts to service and repair satellites and observatories in space, as was demonstrated with the successful repair of the Hubble Space Telescope in December 1993.

Shuttle Accomplishments

- 65 missions successfully accomplished
 - 492 days of flight time accumulated by the fleet
- 364 total crew members flown
 - 321 male (162 different individuals)
 - 43 female (22 different individuals)
- 7.87 years of total person time in space onboard Space Shuttle
- A total of 7,730 tons of cargo have been launched into space
 - 383 tons of payload deployed and left in orbit
- As of December 1994, the Shuttle program has flown 643 payloads
 - NASA = 162
 - DOD = 134
 - commercial = 104
 - foreign = 75
 - educational = 74
 - small, inexpensive payloads = 94

- The Shuttle has deployed 50 payloads
 - 3 interplanetary spacecraft
 - 32 geosynchronous Earth-orbit satellites
 - 7 low-Earth orbit satellites
 - 8 small satellites
- The Shuttle has retrieved 16 payloads
 - 8 deployed and retrieved on same flight
 - 8 retrieved for repair or refurbishing
- Payloads carried on the Space Shuttle serve diverse missions, including:
 - Astronomy
 - Astrophysics
 - Atmospheric Science
 - Geophysics
 - Life Science
 - Materials Science
 - Microgravity Science
 - Planetary Science
 - Communications
 - Solar Physics
 - National Security

Shuttle Facts

- The Space Shuttle has three major components:
 - The Orbiter, which carries the crew, typically 7 people, and the payload in its 60-foot long cargo bay
 - a 154-foot tall external fuel tank, which stores nearly one-half million gallons of liquid hydrogen and liquid oxygen propellants
 - twin 150-foot-tall solid rocket boosters, which are strapped to the external tank. The boosters generate over 6 million pounds of thrust at liftoff and are jet-tisoned 2 minutes into the flight. They are recovered and reused.

- The main engines produce nearly 1 million pounds of thrust and operate about 8 and one-half minutes, from liftoff until the Shuttle achieves orbit. The external tank is jettisoned and burns up in the Earth's atmosphere.
- There are 4 Space Shuttles:
Atlantis, Endeavour, Discovery, Columbia

Future Activities

The primary objective of the Shuttle is to support NASA launch requirements safely and successfully. Because of its unique and well-established capabilities, the Shuttle remains a key element of America's space program. Shuttle flights will operate well into the 21st century at a rate of 7 to 8 missions a year.

- A primary mission for the Shuttle will be the construction of the Space Station and the continuation of NASA's ongoing scientific exploration.
- As part of a cooperative program with Russia that will pave the way for construction of the International Space Station, American astronauts will accumulate 2 years of flight time on the Russian Mir Space Station, and the Shuttle will make at least 7 flights to the Mir Station.
- STS-71, in June 1995, will mark the first docking mission of the Orbiter Atlantis to Mir, followed by 6 more docking missions through 1997.
- The first flight to assemble the International Space Station will occur in December 1997.

Budget

- The Shuttle program is funded under the Human Space Flight portion of NASA's budget. For fiscal year 1995, Shuttle operations are funded at \$3.155 billion, which is approximately 22% of the total NASA budget.

- NASA has significantly improved the efficiency of the Shuttle program, reducing annual operating costs by nearly \$1 billion without compromising safety—almost a 25% reduction in program cost since fiscal year 1992. NASA managers continue to examine additional ways to reduce operational cost while maintaining safety as the number one priority.
- The fiscal year 1996 budget for the Space Shuttle, \$3.232 billion, provides for a program that will continue to improve safety margins, fly the established manifest, launch seven flights every year, provide a vehicle that must undergo significant modifications to operate with the international Space Station and continue to reduce cost.

Partnerships

- Industry—The Shuttle program has flown many payloads in cooperation with other government agencies and private industries. Among the payloads flown on the Shuttle are:
 - telecommunications satellites
 - spacecraft that study the Earth and monitor global air pollution
 - crystal growth facilities, which produce crystals used for designing drugs
 - cellular and biological research payloads, which have direct application to problems associated with cellular, muscle and bone deterioration on Earth
- International—The Shuttle has flown payloads and astronauts from many different countries:
 - Australia
 - Canada
 - Germany
 - Japan
 - France
 - India
 - Italy
 - United Kingdom
 - Mexico
 - Saudi Arabia