



## Launch and Landing Site

Space Shuttle Discovery will be launched from Launch Complex 39B of NASA's Kennedy Space Center, Merritt Island in Florida, just north of Cape Canaveral. Launch pads 39A and B were originally constructed in the 1960's for launching the Apollo missions and have been used to launch the Apollo, Skylab, Apollo-Soyuz and Space Shuttle missions.

The Space Shuttle is transported to the octagonal-shaped launch pad by a large tracked crawler. Each launch pad has a 106-metre tall Fixed Service Structure with three retractable swing arms and a Rotating Service Structure, which rotates around the orbiter. New coatings have been put on the service structures to deal with the critical debris issue.



Shuttle Discovery on launch pad on 16 December 1999 prior to launch of STS-103 Hubble Space Telescope servicing mission with ESA astronauts Claude Nicollier and Jean-Francois Clervoy. Rotating Service Structure (left) shown rolled back. (Image: NASA)

The retractable swing arms of the Fixed Service Structure provide access to the Shuttle on the pad. The lowest arm provides access to the orbiter crew compartment and acts as an emergency escape route for the crew up to seven minutes, 24 seconds before launch. The middle arm is used amongst other things for attachment of umbilicals to the external tank to support tanking and launch. The highest arm contains a vent hood, which is used to prevent ice formation at the liquid oxygen vent system at the top of the external tank.

The 40-metre high Rotating Service Structure provides protected access to the Shuttle orbiter

for installation and servicing of payloads at the launch pad, as well as servicing access to certain systems on the orbiter. It is retracted before launch.

There is a 3400 m<sup>3</sup> tank for storing liquid oxygen at -183 °C and a 3200 m<sup>3</sup> tank for storing liquid hydrogen at -253 °C. The launch pad contains a flame trench, which is 150 metres long, 13 metres deep and 18 metres wide.

As a majority of Shuttle orbiters, the STS-121 Discovery return flight and the return flights of ESA astronauts Thomas Reiter and Christer Fuglesang on the STS-116 mission, are scheduled to land at the Kennedy Space Center on one of the largest runways in the world. The runway is located 3.2 km northwest of the Vehicle Assembly Building and is 4,572 meters long and 91.4 meters wide.



Orbiter Atlantis landing at the Kennedy Space Center following STS-112 mission on 18 October 2002. (Image: NASA)

The facility includes a 150 x 168 meter parking apron and a 3.2 km tow-way connecting it with the Orbiter Processing Facility. Located adjacent to the parking apron is a Landing Aids Control Building (LACB) which supports landing operations and houses operations personnel. The Shuttle Landing Facility is equipped with a number of navigation and landing aids to assist Shuttle pilots in landing.

A Recovery Convoy Staging Area, located just east of the runway about midway along its length, houses trailers, mobile units and specially designed vehicles that are used to "safe" the orbiter immediately after landing for crew egress and transfer of the orbiter to the Orbiter Processing Facility.