

NASA Facts

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FS-2003-08-074-DFRC

Mate-Demate Device



EC96 43493-1 The Space Shuttle Atlantis receives post-flight servicing in the MDD following its landing at the NASA Dryden Flight Research Center, Edwards, Calif., March 31, 1996. Atlantis is shown atop Shuttle Carrier Aircraft 905.

The Space Shuttle Mate-Demate Device (MDD) at NASA's Dryden Flight Research Center, Edwards, Calif., is a large gantry-like steel structure used to hoist the orbiters off the ground during post-landing servicing operations and during mating and demating operations with the 747 Shuttle Carrier Aircraft (SCA).

Construction of the MDD was completed in late 1976. It was first used during mate-demate operations with the prototype orbiter Enterprise during the Approach and Landing Tests (ALT) in 1977. It has been used for all post-landing and SCA mating operations at Dryden since the ALT program.

MDD Description

The facility consists of two 100-foot towers with stationary work platforms at the 20-, 40-, 60- and 80-foot levels on each tower and a horizontal structure mounted at the 80-foot level between the two towers. The horizontal unit cantilevers 70 feet out from the main tower units and controls and guides a large lift beam that attaches to the orbiters to raise and lower them.

Three large hoists are used to raise and lower the lift beam. Two of the hoists are connected to the aft portion of the lift beam and one hoist is attached to the beam's forward section. The three hoists operate simultaneously in the hoisting process. Each of the three hoists has a 100,000-pound lift capability. Operating together, the total lifting capacity of the three units is 240,000 pounds (120 tons).

Orbiter Servicing

During orbiter turnaround operations, two access platforms for orbiter servicing specialists are positioned on each side of the orbiter after it is towed into the MDD. The platforms are normally stored at the 60-foot level when not in use. During servicing operations the platforms are lowered on each side of the orbiter by a pair of telescoping tubes extending down from the cantilever section.

Two equipment hoists, each capable of lifting 10,000 pounds are also built into each tower. These hoists operate up to the 60-foot level of the MDD.

MDD Construction

Connell Associates Inc. of Coral Gables, Fla., designed the MDD. It was constructed in 1976 by George A. Fuller Co., Chicago, Ill., at a cost of \$1.7 million.

The Space Shuttle hangar, near the MDD, is a single-bay 25,000 square-foot structure 170 feet deep, 140 feet wide and 80 feet high.



EC01 0041-15 The Space Shuttle Atlantis is placed atop Shuttle Carrier Aircraft 911 while inside the MDD in preparation for its March 1, 2001, departure to the Kennedy Space Center.

A 6,700 square-foot annex on the north side of the hangar building is used for administrative offices, ground operations control room and a joint-use shop area.

Space Shuttle Hangar

Inside the hangar, two overhead bridge cranes provide lift capability for orbiter (or aircraft) servicing and maintenance operations. Each crane has a lift capability of 50,000 pounds.

Voorheis, Trindle and Nelson, Irvine, Calif., designed the hangar. It was built by Santa Fe Engineers Inc., Lancaster, Calif., at a cost of \$3.7 million. Construction was completed in early 1976.

A concrete tow-way, 60 feet wide and 15 inches thick, connects the MDD and the Space Shuttle hangar with the aircraft ramp at the main Dryden complex, and with the taxiway extending onto the Edwards Air Force Base flightline and runway network.