



NASA Dryden Flight Research Center



Dryden Flight Research Center

EC01-0264-55

The Dryden Flight Research Center, NASA's premier installation for atmospheric flight research, is chartered to research, develop, verify and transfer advanced aeronautics, space and related technologies and conduct atmospheric Earth and space science flight operations. The center is named in honor of Dr. Hugh L. Dryden, who served as director of the National Advisory Committee for Aeronautics (NACA), NASA's predecessor organization, and later as deputy administrator of NASA.

NASA Dryden's history dates back to late 1946, when 13 engineers and technicians from the NACA's Langley Memorial Aeronautical Laboratory came to Muroc Army Air Base (now Edwards Air Force Base) in Southern California's high desert to prepare for the first supersonic research flights by the X-1 rocket plane in a joint NACA, Army Air Forces and Bell Aircraft research pro-

gram. NASA Dryden is a tenant organization at Edwards and is located adjacent to Rogers Dry Lake, at 44 square miles is the largest dry lakebed in the world. The center flies a variety of specialized research and support aircraft within a 20,700-square mile restricted airspace test range.

In addition to the main campus at Edwards, Dryden bases several science aircraft at the Dryden Aircraft Operations Facility in nearby Palmdale, Calif.

The center is associated with many important technological milestones in aviation and space access: supersonic and hypersonic flight, digital fly-by-wire control systems, supercritical and forward-swept wings, and the space shuttles. NASA Dryden was also where the Apollo program's Lunar Landing Research Vehicle, the famed X-15 rocket plane, and the wingless lifting bodies were

NASAfacts

tested during the 1960s and 70s. Dryden continues to conduct research and provide support for NASA's efforts in aeronautics technologies, human space-flight, space exploration and Earth and space science. A sampling of current and recent projects includes:

- **Orion Crew Exploration Vehicle:** Dryden is playing a significant role in the development of this next-generation spacecraft, including planning for and conducting the Orion launch abort systems tests, drop tests, landing and recovery tests. Dryden is also developing re-entry and landing profiles, range safety requirements and integration, flight test support and performing independent analysis.
- **Stratospheric Observatory for Infrared Astronomy (SOFIA):** NASA Dryden is installing and integrating mission systems and flight testing SOFIA, a world-class airborne observatory complementing the Hubble Space Telescope and ground-based telescopes. The observatory features a German-built 2.5 meter diameter infrared telescope weighing about 20 metric tons mounted in a highly modified Boeing 747SP aircraft. SOFIA is a joint program by NASA and the German Aerospace Center (DLR). Once operational, SOFIA will be the world's primary infrared observatory for up to 20 years.
- **Intelligent Flight Control System:** This project is validating the application of "self-learning" neural network software to aircraft digital flight control computers, using a highly modified NF-15B aircraft.
- **X-43A/Hyper-X:** NASA's 12-foot-long unmanned X-43A hypersonic research aircraft became the first scramjet-powered aircraft to fly freely. Scramjet engines hold the potential to increase payload capacity for future hypersonic vehicles by consuming ambient oxygen for combustion rather than having to carry an oxidizer on board, as rocket engines require. In 2004, two X-43As flew at Mach 7, or about 5,000 mph, and nearly Mach 10, close to 7,000 mph, under their own power for a brief period, world records for air-breathing propulsion.
- **Active Aeroelastic Wing:** This Air Force Research Laboratory-funded project demonstrated roll control

provided by active control of wing flexibility on a modified F/A-18 at transonic and supersonic speeds – a modern high-tech outgrowth of the "wing warping" technique used by the Wright brothers to maneuver their first aircraft.

- **Earth Science:** Dryden supports data collection for the scientific community with a DC-8 airborne laboratory; Ikhana, a Predator B adapted for civil use; a Gulfstream III; two Global Hawks, and two high-flying ER-2s, civil variants of the U-2S reconnaissance aircraft. These aircraft conduct atmospheric sampling, environmental imaging and satellite sensor validation missions around the globe.
- **Space shuttle support:** NASA Dryden continues to support NASA's human space flight program as an alternate landing site for the space shuttle orbiters. Dryden has been the site of 51 space shuttle landings since the first orbital flight in April 1981, most recently the landing of shuttle orbiter Discovery at the end of mission STS-117 in June 2007. After an Edwards landing, orbiters are serviced at Dryden for ferry flights back to Kennedy Space Center in Florida atop one of NASA's two modified Boeing 747 Shuttle Carrier Aircraft. Dryden was also the site of the approach-and-landing tests of the prototype shuttle orbiter Enterprise in 1977.

Along with research and support aircraft, Dryden assets include a high-temperature and loads calibration laboratory; aircraft flight instrumentation capability; a flow visualization facility to study airflow patterns; a data analysis facility to process flight research data; and remotely piloted vehicle flight research expertise. Dryden's Research Aircraft Integration Facility simultaneously checks aircraft flight controls, avionics, electronics and other systems and houses Dryden's flight research aircraft simulators. The only facility of its type in NASA, the facility is designed to accelerate and enhance systems integration and preflight checks on research aircraft.

From a handful of engineers who established the center in the late 1940s, Dryden now employs more than 1,100 government and contractor personnel at its Edwards and Palmdale facilities.

National Aeronautics and Space Administration
Dryden Flight Research Center
P.O. Box 273
Edwards, CA 93523-0273
Voice 661-276-3449 FAX 661-276-3566