

NASA RANGE SAFETY PROGRAM 2005 ANNUAL REPORT

Dryden Flight Research Center

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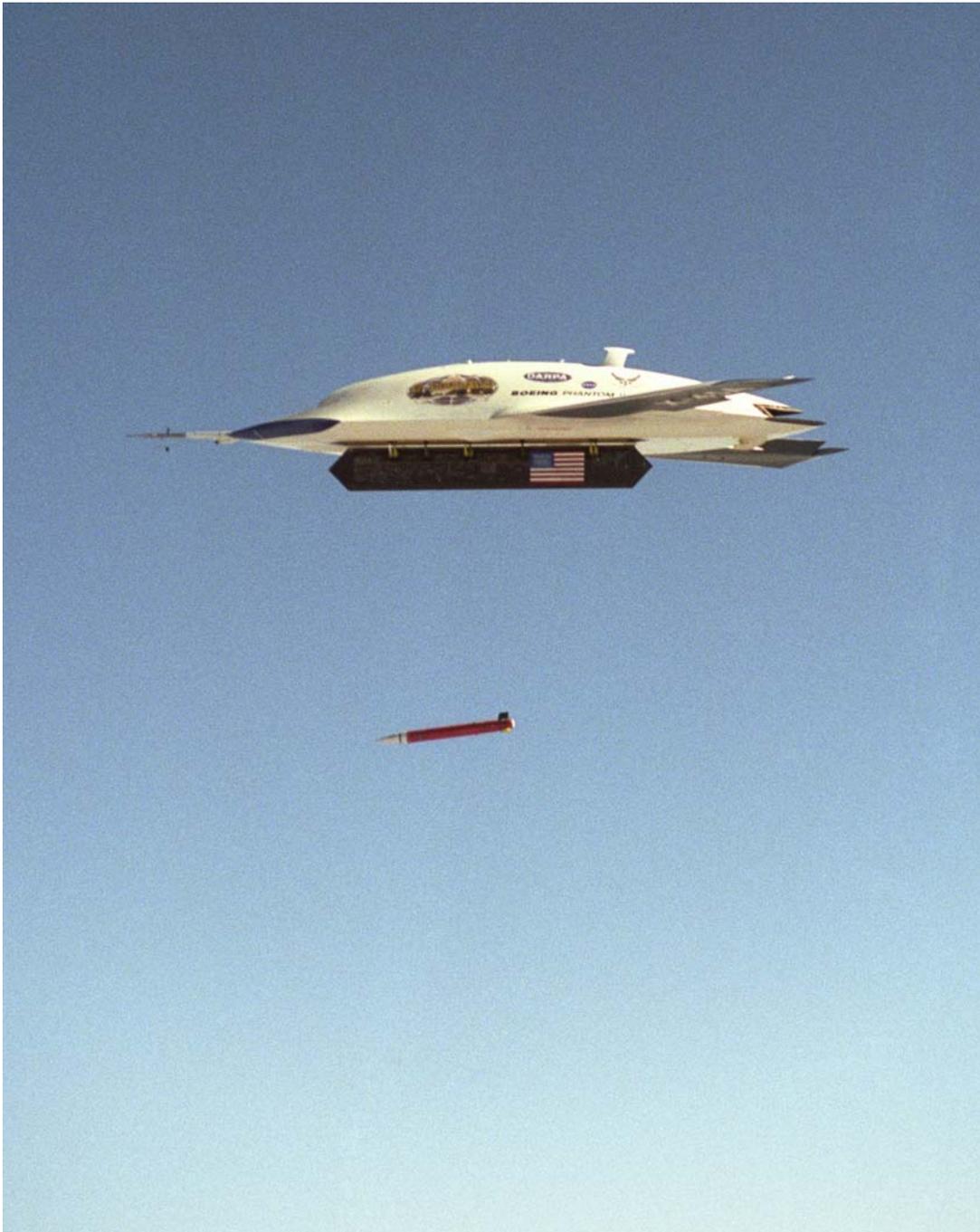
The Dryden Flight Research Center, located at Edwards Air Force Base, California, is NASA's primary installation for flight research. Over the past 50 years, projects at Dryden have led to major advancements in the design and capabilities of many civilian and military aircraft.

The center supports operations of the Space Shuttle and development of future access-to-space vehicles, conducts airborne science missions and flight operations, and develops piloted and uninhabited aircraft test beds for research and science missions. Dryden continues to support the testing of a wide range of uninhabited aerial vehicles (UAVs). The UAVs that were flown with Dryden assistance are described below.

X-45A Unmanned Combat Air Vehicle

The Unmanned Combat Air Vehicle Program was a joint DARPA/Air Force/Boeing effort to demonstrate the feasibility for a UAV to serve in various front-line, combat support roles. The X-45A completed the final flight of the program in August of this year, successfully conducting 64 flights with two test vehicles.

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Some highlights of the program included:

- Release of a Global Positioning System guided weapon
- Operation of two X-45A vehicles with a single operator
- In-flight transfer of operator control of two X-45A vehicles to a ground control station nearly 900 miles away

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- Autonomous action of two X-45A vehicles to perform cooperative tracking, targeting, attack, and battle damage assessment on a set of simulated targets

Pathfinder Plus

AeroVironment's Pathfinder Plus successfully completed two flights in September, concluding the final flights ever of the Pathfinder Plus. The purpose of the flights was to collect information that will allow existing analytical tools to more accurately model atmospheric turbulence effects on large, low-stiffness, lightweight, high-aspect ratio composite structures.



Altair

General Atomics-Aeronautical Systems' Altair successfully completed two flights with NOAA scientific payloads in November. One flight lasted for 7 plus hours and the other for 18 plus hours. The purpose of the flights was to demonstrate the feasibility of a high altitude, long endurance UAV to conduct oceanic and atmospheric science missions.

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Model-Type UAVs

The Networked UAV Project, in collaboration with NASA's Ames Research Center, used RnR Products' APV-3 to evaluate new flight-control software that will allow UAVs to autonomously react to obstacles as they fly pre-programmed missions. This technology may one day enable swarms of aircraft to move safely from one area to another as a flock or group.

The Sandia DART Project used Dryden's Utility Model to drop sensors developed by Sandia National Laboratory.

The Autonomous Soaring UAV Project used RnR Products' Cloud Swift sailplane to demonstrate that using thermal lift could significantly extend the range and endurance of model UAVs without a corresponding increase in fuel requirements.

Range Safety Office

Range Safety operations at Dryden are managed by the Range Safety Office, formerly the Range Safety Systems Office. The Dryden Center Director established the office, under an alliance agreement with the Air Force Flight Test Center, to provide independent review and oversight of range safety issues. The office also supports the center by providing trained flight termination system engineers, range safety risk analysts, and Range Safety

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Officers to provide mission and project support. In addition, the Range Safety Office supports the NASA Range Safety Training Program by providing the UAV perspective in the development of the Range Safety classes.