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Aurora Flight Sciences Receives NASA Contract for Development of a Robust Flare Planner for Manned and Unmanned Applications

Cambridge, MA, May 26, 2010 – Aurora Flight Sciences announced today that it was awarded a NASA contract to develop and demonstrate a method for generating robust autonomous flare maneuvers. The goal of a flare maneuver is to safely transition an aircraft from final approach to touchdown, decelerating the vehicle and setting up a safe landing attitude. During this transition, a complex series of dynamic events can occur, and the pilot or autopilot must address uncertainty in aerodynamics, disturbances such as cross-winds and, in severe circumstances, aircraft impairment. Aurora’s robust flare planner is uniquely suited to these challenges, and thus has the potential to improve both manned and unmanned autoland systems.

Aurora’s Flare Planner takes advantage of recent advances in control theory which allow for fast ‘on-the-fly’ determination of appropriate control inputs for complex dynamic situations – these methods efficiently generate flight paths that simultaneously satisfy vehicle performance limits, constraints, and touchdown criteria. Recent theoretical extensions by MIT, along with recent developments at Aurora, promise to make these landing policies not only more optimal, but better able to react to disturbances that require the execution of a ‘contingency’ plan. During the Phase 2 effort, Aurora is teaming with Professor Emilio Frazzoli of the MIT Aerospace Robotics and Embedded Systems Laboratory to develop these tools into a fully functional software system that can be incorporated into both manned and unmanned systems, and to demonstrate it in a hardware in-the-loop simulation environment, in preparation for follow-on flight testing in either a manned or unmanned test bed aircraft.

Robust flare planning has the potential to greatly increase the reliability of unmanned air vehicle (UAV) operations. The largest fraction of incidents involving UAVs occurs during the landing phase of flight, and the most challenging maneuver during this phase is the landing flare. Conducting a safe flare maneuver—especially in strong or gusty winds or if the vehicle is impaired—can require use of different control surfaces in an unconventional and/or complex way. By addressing these challenges, “Aurora’s new technology represents a critical step towards achieving the goal of a ‘crash proof’ aircraft,” said James Paduano, Lead Engineer for Autonomy, Controls, and Estimation at Aurora’s R&D Center.

About Aurora Flight Sciences

Aurora Flight Sciences designs and builds robotic aircraft and other advanced aerospace vehicles for scientific and military applications. Aurora is headquartered in Manassas, VA and operates production plants in Bridgeport, WV and Columbus, MS and a Research and Development Center in Cambridge, MA. To view recent press releases and more about Aurora please visit our web site at www.aurora.aero.

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