

Virginia Aviation History Project



A Flying Car at VCU?

by Michael Mercier, VCU School of Engineering

This past April 2009, a team of five Mechanical Engineering students at Virginia Commonwealth University unveiled their Senior Design project - the Hover Car Air Transport.



Hover Car concept drawing

The Hover Car Air Transport is a vehicle that will take off and land vertically like a helicopter. However, unlike a helicopter, it will be safer and easier to fly within an urban environment, in-between buildings. With this capability, this flying car-like vehicle will serve as an urban emergency response vehicle, a military transport and a personal air vehicle. Currently, the first phase of many has been completed toward this design.

For the past year the team of five sacrificed many weekends and nights to contribute to the project. The work was advised by Dr. Raman Pidaparti, a VCU Mechanical Engineering

Professor. As the team worked together, everyone had an area of speciality. The team leader,



The Hover Car Air Transport Prototype

Michael Mercier, has had the dreamed of building a personal air vehicle since he was a young boy. He pitched the idea to the team and found sponsors to make it possible. Keeping the reality of the goals in check was Paul Inskip, an experienced welder and lead fabricator. Kwan Burke brought the design ideas digitally to life using SolidWorks CAD software. These

visuals were crucial to the advancement of the design process. The technical and mathematical analysis of the design was spearheaded by Landon Holbrook. These analyses confirmed the feasibility of the design. The fifth team member, Ben Rickey, diligently worked without tiring on all aspects of the prototype construction.

A full scale prototype of the Hover Car was built by the team in only nine months while they all studied with full course loads. The prototype was built to act as a research and testing platform for the final design. Three main components were designed, built and tested. The first system was the vehicle frame. This was built using steel tubing to save time and money, while a final version will probably be

built from carbon fiber and aluminum. The second system was the lift system. This system amounted to two six-foot shrouded propeller configurations. Shrouding a propeller increases lift by limiting the negative effects of an open propeller and also by “focusing” the thrust and better utilizing the momentum of the flowing air. Finally, a drive system was constructed which transferred power from two engines to the propellers. The system uses a chain drive to keep complexity low and allow for the propellers to be spun in opposite directions.



Team Awesome (from left): Paul Inskip, Ben Rickey, Landon Holbrook, Dr. Ramana Pidaparti, Michael Mercier, Kwan Burke

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A proud sponsor: Dr. Ramana Pidaparti, Paul Inskeep, Ben Rickey, Landon Holbrook, Van Crosby, Michael Mercier, Kwan Burke

Funds and support to build the vehicle required the sponsorship of several local and distant organizations. The Virginia Aeronautical Historical Society was one of the largest donors and was a key to the successful building of the Hover Car prototype. Because of this support and the hard work and dedication of the team, the project won first place for Excellence in Design in Mechanical Engineering at the VCU Engineering Senior Design Expo in April.

The Hover Car is currently on display at the Virginia Aviation Museum at the Richmond International Airport. It will remain there for the summer as the team continues work and testing on the prototype. In the fall, it is hoped that more VCU engineering students will take on the challenges to design the remaining systems of the vehicle, so that it will one day soon be flying over head.



Remembering 9/11

By Linda Burdette based on a presentation by LTC (ret) Robert Darling, USM

By anyone's definition, the tragic events of September 11, 2001, were historic in the United States, indeed for the world. For aviation, it was a crucial event – changing not only the way pilots and aircraft operate, but in many ways forever changing the way the public views aviation. Virginia certainly had a major role in the events of that day – one of the airplanes departed from Dulles International Airport; it subsequently hit the Pentagon; the major responders at the Pentagon were Virginia Police and Fire Departments; and, as in so many other events of national importance, many of the highest-level decisions of the day were made at the Pentagon and across the river in Washington, D.C. I recently had the opportunity to attend a presentation by a retired military officer who spent 9/11 at the Presidential Emergency Operations Center. This article is based on his remembrance, as well as historical documents.

September 11, 2001, began as a beautiful fall day and Major Robert Darling felt lucky to be working at the White House. Darling, a Marine aviator, was a veteran of the first Gulf War, and had prior assignments to Somalia and Marine recruiting duty. He had just completed a stint as a member of HMX 1, the helicopter detachment supporting the White House where he was the co-pilot for President Clinton and Pilot in Command for Vice-President Gore. Now he was assigned to the White House Airlift Operations Office, providing logistical support for the President and Vice President during travel. He knew that he faced a busy week, but not an insurmountable one. The President was in Sarasota, Florida, but both the Vice President and the National Security Advisor were at the White House, so Darling's office would not be taxed too badly.