William J. Fredericks

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SUMMARY

Aeronautical engineer who has created several unique aircraft designs that have been taken to flight. Leads projects with a results oriented mindset which enabled these aircraft to get to flight faster and less expensively than peers and superiors believed possible. In addition to technical experience gained at NASA, Bill is a veteran. His experience and training as a US Marine Corps Officer has provided significant leadership experience.

EXPERIENCE

Advanced Aircraft Company Williamsburg, VA
Founder and Chief Executive Officer *2015 - Present*

Advanced Aircraft Company (AAC) is a startup aeronautical engineering and manufacturing company that will produce vertical takeoff and landing (VTOL) unmanned aerial systems (UAS) that incorporates electric propulsion technologies based on current NASA research and development. AAC is a subchapter S corporation in the commonwealth of Virginia and was founded in October 2015. AAC is currently developing an Octo-rotor Unmanned Aerial System (UAS), named Hercules, that has over five times the range and endurance of the next best in class competing UAS while carrying a five pound payload. Mid-term plans for the corporation include developing an advanced version of NASA's Greased Lighting UAS. Long-term plans for the corporation include developing larger aircraft to carry passengers that will revolutionize mobility for ordinary middle class citizens.

NASA Langley Research Center Hampton, VA
Aerospace Engineer, Aircraft Systems Analysis Branch, Systems Analysis and Concepts Directorate *2003 - 2017*

Leadership & Honors:

- Graduate of NASA's Foundations of Influence, Relationships, Success and Teamwork (FIRST) Program; enrollment is limited to employees who are on a fast track to leadership positions within the agency. Formal training in oral and written communication, managing teams and influencing subordinates, peers and supervisors in a collaborative manner.
- Achieved a Distinguished Evaluation in 2015 for his exceptional work performance.
- Awarded a NASA Langley Research Center Group Award for the design, build and flight of the GL-10 aircraft.

Notable projects include:

- Greased Lightning (GL-10): Ideated the GL-10 configuration and performed the conceptual design analysis of the aircraft. Led and motivated a team of 49 total contributors, which required frequent coordination between 1) performance analyses, 2) to supervising the technicians in the fabrication shop, 3) to ensuring proper system interfaces between disciplines, in order for the project to be executed smoothly. The GL-10 design objective is to provide for a vertical takeoff and landing (VTOL) aircraft with a 24 hour endurance that can autonomously fly to a target area and place sensors in the ground discreetly. The key to the revolutionary performance is the aerodynamic efficiency of the aircraft while still maintaining robust VTOL and transition control authority. In April 2015 the aircraft expanded its flight envelope through the transition corridor into wing borne flight and has validated via flight test the feasibility of this aircraft design.
  YouTube Video Search: "NASA Greased Lightning"
- Reusable Mars Aircraft: Ideated the concept and designed a reusable Mars aircraft. This electric VTOL would land next to a future Mars rover to have its batteries recharged to enable the aircraft to be reusable. Also led the design of the rotors OML and rapidly performed the hub's structural sizing analysis. The aircraft is currently performing hover tests in a vacuum chamber and will drop from a balloon in fall 2015 at 100,000 feet to simulate the Martian atmosphere.
- Truss Braced Wing Airliner: Responsible for critical sizing studies of a truss braced wing configuration to enable higher aspect ratio and reduced sweep. This analysis showed a significant increase in the aerodynamic efficiency to enable a substantial reduction in the block fuel required.
- Dynamic Soaring UAV for Atmospheric Data Sampling inside a Hurricane: Performed a conceptual design and trajectory analysis of a dynamic soaring UAV that could sustain flight as long as the hurricane had Category I or higher wind speeds. This design will enable the aircraft to fly within the low altitude boundary layer of a hurricane in order to improve hurricane intensity forecasting.
- Ares I Aerodynamic Database Team: Synthesized wind tunnel data from Mach 0.3 to Mach 4.5 to build an aerodynamic model of the launch vehicle to provide to the Guidance Navigation and Control team (GNC). This aerodynamic model enabled the GNC team to compute trajectory and control system gains for the vehicle as it ascends to orbit.

United States Marine Corps, 3rd Battalion 14th Marine Regiment — Multiple Locations
Captain, Artillery — *2008 - 2014*

Awards:

- Awarded the Navy-Marine Corps Commendation Medal in 2010 for exemplary service.
- Awarded the Navy-Marine Corps Commendation Medal again, in 2011, while serving in Afghanistan.

Billets Served in:

- Executive Officer for H Battery: Successfully managed the operations of the battery in support of the Commanding Officer's directives which included numerous live fire field exercises.
- Battalion Fire Direction Officer: Directed and coordinated the firing of the Battalion's 4 artillery batteries safely and responsively during large scale joint exercises.
- Deployment to Afghanistan: Led a HIMARS rocket artillery platoon; served as the Assistant Camp Commandant at a remote fire base, where the primary task was to plan and then execute a base expansion project for the new quarters for an Afghan National Army (ANA) Battalion. Coordinated with and directed US military construction units, as well as US and local Afghan companies to build the ANA compound. Also led foot patrols, set up snap vehicle checking points (VCPs) searching for smuggling of improvised explosive device (IED) components or materiel.
- Battery Fire Direction Officer for H Battery: Commanded the firing of the howitzers and verified/approved their trajectory computations.

EDUCATION

PURDUE UNIVERSITY — West Lafayette, IN
B.S. in Aeronautical Engineering (GPA: 3.75 / 4.00) — *Dec 2006*

- Concentration in Aircraft Design and Propulsion
- Sr. Design Team Leader: Designed, fabricated and successfully flight tested a 9 ft. wingspan and 27 lb max takeoff weight UAV.
- Passed the Professional Engineering (PE) Exam which earned my Engineer in Training (EIT) certificate.

Leadership and Honors:

- President of Theta Tau Fraternity
- Director of Philanthropy on the Inter-Fraternity Council
- Member of the Aerospace Engineering Honor Society (Sigma Gamma Tau)

ADDITIONAL

- Invited to speak at 6 conferences/events on the development of GL-10
- Private pilot; owner of a 1981 Mooney M20J. FAA licensed in gliders, single-engine, multi-engine aircraft and instrument rated. Total Flight Time: 615.5 hours as of Sept 5, 2017.
- Avid sailor; student crew member aboard a 188 ft. tall ship in 2000-2001, sailed 32,000 nautical miles that included 3 Atlantic Crossings, a transit of the Panama Canal to the Pacific and a rounding of Cape Horn.
- Parishioner at St. Bede's Roman Catholic Church in Williamsburg, VA participating in Bible Studies and occasional retreats.
- Numerous presentations to middle school and high school students regarding various NASA projects to enhance student interest in science, math and engineering.
- Active volunteer for Big Brother Big Sisters (taught two 1-day Wind Turbine Workshop for children), Habitat for Humanity, and St. Bede's Homeless Shelter.