

Cover Letter

Eric D Becnel

I am Eric Becnel, graduating in December 2013 from the University of Alabama in Huntsville (UAH) with a Master's degree in Aerospace Engineering and a concentration in Advanced Heat Transfer. I have been the Team Leader through the lifecycle of the ChargerSat-1 Mission, a fully operational, orbital satellite mission. I am seeking employment beginning in January 2014. Here is a review of my engineering life.

My passion is to design, engineer, build, test and operate complex systems. I have always played with stuff in my garage, building many garage toys such as go-carts and remote control boats from scratch. I earned Eagle Scout in 2003 by leading a team in building a bridge across a water way. Since then, I went to UAH for both my undergraduate and graduate education in Aerospace Engineering. Classes were a great place for me to learn the fundamentals of engineering. While at UAH, I have led many design teams through scientific and competitive development processes:

- **ASME Student Competition**, a design competition involving human powered water distillation. This was my first project at UAH and provided a very difficult challenge for me as a freshman. Here I learned that our failures could be solved through engineering, specifically involving fatigue. We did not go to competition, but I did decide that these projects were for me and I then got more involved.
- **Two UAH Moon Buggy Competition Teams**. For 2 years, I led a team of over 20 members through learning all needed fabrication and design techniques to deliver 2 competition Moon Buggies. This included CAD, CAE, CAM and CNC machining, composites fabrication, funding proposal, test course design and fabrication, and instrumentation. At the end we counted nearly 1000 individual parts on the system.

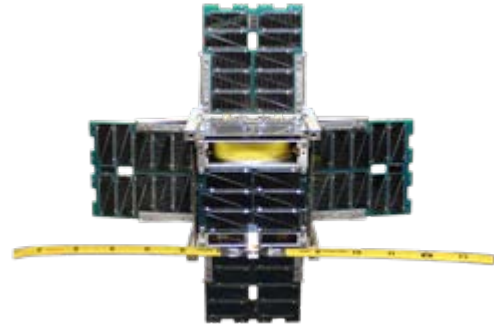


- **25 High Altitude Balloon Missions**, including technical and scientific payload development, long range communications, payload tracking, real time flight operations and payload recovery. These payloads flew up to 125,000ft high and would go 130 MPH in flight. The vacuum and cold of space are a constant threat to every aspect of these missions.

• **Four International CanSat Competition Teams**, a design, build and fly mock satellite competition. The project included the full design, design review process, fabrication, testing, and flight operations of a rocket deployed payload. The flight was a few thousand feet high and the system had descent control, payload interface and streaming telemetry objectives. This was the training ground for me as the leader of ChargerSat-1 and other integrated systems I have worked on.

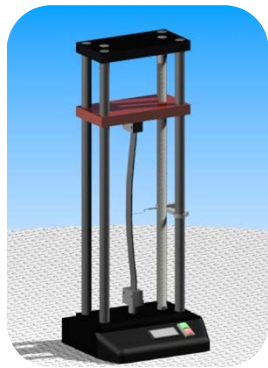


- **ChargerSat-1 CubeSat**, a fully operational satellite weighing 1.046kg within a 10cm cube volume. This satellite is being launched to space on November 4th, 2013, starting up to a 2 year mission in space. I am the ChargerSat-1 team leader, leading the team from conception of this design in May 2010 to delivery and start of flight operations in December of 2013. In this time, I led the team through all design, engineering, testing and integration of the satellite meeting all launch requirements of NASA and the Air Force for its ride to orbit. In 2012, I got to test the mechanical deployment functionality on a parabolic flight, similar to the Vomit Comet. The satellite is the first of its kind for a student group at UAH following the now popular CubeSat standard. The satellite includes over 1200 parts and 21000 lines of code. In addition to leading the team and being involved in every major decision of every internal system, I also played the role of engineering the mechanical, thermal, communications and ground station system. I designed and executed a series of tests on the system to prove its operation and launch worthiness of the system. I look forward to the successful operation of the mission. I intend to pass the ChargerSat satellite development program to the future leaders of this program.



Many of these experiences are tied to an organization I joined in 2007. This organization is the UAH Space Hardware Club, a completely student run, volunteer club. While working the club I have participated as a BalloonSat Team Leader many times, Club President for 2 years and finally the ChargerSat-1 Team Leader. I have my amateur radio license, KF5OHB, which I use for many of these flight operations.

In working on these projects I have been heavily involved in the federal proposal process, design, fabrication and testing of a wide variety of systems. I have become heavily experienced with CNC and composite fabrication. I have performed testing in many different fields including: structural, thermal, propulsion, vacuum, vibration, RF, electrical, flight software, flight readiness, and other testing.



In course work, my senior design project was to design a piece of lab equipment the department uses to this day. The equipment is a column buckling apparatus that compresses structural elements through their peak load to demonstrate the engineering calculation accuracy. The equipment improved the testing setup and provided experimental results greater than 80% of theoretical. Previous off-the-shelf systems provided less than 40% of anticipated results.

I also worked on a senior design project involving the initial hardware testing of a rocket deployed loiter vehicle. On this project, I prepared the communications system for testing the hardware including an auto tracking high gain antenna.

While at UAH I have had the opportunity to have two internships. The first was at Orion Propulsion. I supported the final assembly and delivery of the Forward Propulsion System for the Bigelow Sundancer Project. I designed and built a suitcase table-top demonstration of the thruster along with ground support equipment to protect the flight hardware in travel and storage.

I have participated in many conferences, some international, representing UAH in the work that I have participated in. I have had three conference technical presentations at these conferences.

The second internship was at Marshall Space Flight Center, EV-34 Thermal and Fluid Analysis Branch. Here I learned about advanced heat transfer techniques and applied them to a concept mission of an on-orbit cryogenic fuel depot. Working directly with NASA engineers was really rewarding and gave me a NASA workplace perspective as compared the small company prospective of Orion propulsion. Both settings were great to work in.

My hobbies outside of UAH have included mountain biking, rappelling, high powered rocketry (see photo) and remote controlled aircraft. I have not had as much time as desired for these personal projects, but I try my best to make time for them.



As I look for a job in industry, I am looking for a place that can challenge me with advanced concept designs. A research and development environment would be a dream job for me. I have enjoyed and hope to continue being creative in solving technical problems and bringing ideas to a prototype and testing level.

I can offer a very strong contribution to an interdisciplinary development team and hope to be challenged with integrated systems. The harmony of mechanical and aerospace systems with embedded electronics and communications has really intrigued me. I enjoy the challenges of delivery deadlines, real time flight operations and testing.

I appreciate your consideration for employment.

Thanks,

Eric D Becnel

1501 Old Monrovia Rd, Apt 13114
Huntsville, Al 35806
985-237-0703