

Rocketeering is really taking off!

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The Falcon Rocketeers, a team of students from Huntsville, Alabama, is participating in the United Launch Alliance intern payload project. This is a yearly challenge for teams to design and build a payload to be flown in one of the ULA rockets built by their interns. There are 17 payload slots available, of which 5 are designed and built by interns from Ball Aerospace and the other 12 are made by high school and middle school students. The Falcon Rocketeers submitted two projects and both of our payloads were accepted to fly in this 30-foot rocket.

There are specific guidelines for the payload and some are- Payloads can either be ejected from the rocket or remain with the rocket and be recovered. The payload needs to withstand 10 Gs during launch acceleration and up to 100Gs during ejection. (One G is the force of Earth's gravity -- it is this force that determines how much objects weigh. At 10 Gs, an object experiences a force equal to ten times its weight. 100 Gs equal a force 100 times the weight of an object.) The payload needs to fit into a container 4 by 6 inches for ejected payloads and 9 inches for the other. In addition, ejected payloads must return to the ground at less than 20 miles per hour.

The team's first experiment is called "Bolling in the Wind" and cotton boll are used to see where a rocket's payload would disperse and see how far it would be away from the eject location. This

idea came to mind because Alabama is a large producer of cotton. Each cotton boll will have a barcode attached. This allows the finder to scan the barcode and this will take them to a Facebook page where the finder can log in information about where the boll was found.

Our second experiment is called “The DaVinci Code,” and is going to measure maximum acceleration and altitude of rocket only using things DaVinci had available in the 15th century. One idea for measuring the altitude is using a cork ball that will drop when the payload is ejected. The ball will be brightly colored and we will time how long it takes to fall to the earth. This would be a free fall and is called acceleration of gravity. Air resistance induces a drag force on the ball as it falls through the atmosphere and this drag force increases with velocity until it equals gravitational force leaving the ball to fall at a constant terminal velocity. The team is thinking of things that DaVinci would do if he were a team member.

The payload ideas are a great thing to do. Learning what engineers do every day and how they do it is also a great way to show our creativity. Payloads can be electrically & functionally active or passive, simple or complicated. They can be or do almost anything you can dream up. United Launch Alliance and Ball Aerospace mentors provide guidance for the high school students on basic rocket concepts, payload designs and payload integration with the rockets. This provides a unique opportunity for an exciting and educational project. The Falcon Rocketeers is extremely excited about this challenge. They cannot wait to see their payload and all our hard work take off in that rocket at the end of July outside of Pueblo. We hope that there are some rocket teams from the Denver Area that will also be participating or will just come out to watch.