



Explorer Post 1010

TARC Team 8296

Chris Fann
Ronnie Foreman
Phil Manougian
Amanda Steckel

Design Process

- We made use of the rocket design software, RockSim to digitally build and test our rocket before official production.
- Since we had years of experience, we assumed a basic design. We had some parts left over from last year.
- We tested streamers last summer. We developed experience loading and deploying them.
- We researched streamer deployment techniques. We saw how to run the streamer connection line outside the rocket up to the nose cone.
- We used our launch rails and rail buttons from last year.



Final Design

Our final design was a 38 inch rocket.

- BT80 Body Tube
- 3 7x70 inch Streamers
- F32-6T Motor
- Nosecone PNC-80K (Ogive)
- Altimeter PerfectFlite Alt15k

Our cargo unit was 22 inches long in order to have a large cross section when descending. We attached three streamers to the cargo unit - one at the aft end, one on the nose cone and one in the middle.



Flight Testing

We conducted 17 test launches in order to refine our streamer deployment and rocket weight.

- December 30 - two launches (F32-4T)
- January 16 - two launches (F32-4T)
- February 20 - two launches (F32-4T)
- February 27 - two launches (F32-4T)
- March 20 - four launches (KATO with F32-6T)
- March 27 - five launches (F32-6T and backup booster)

Success/Failure

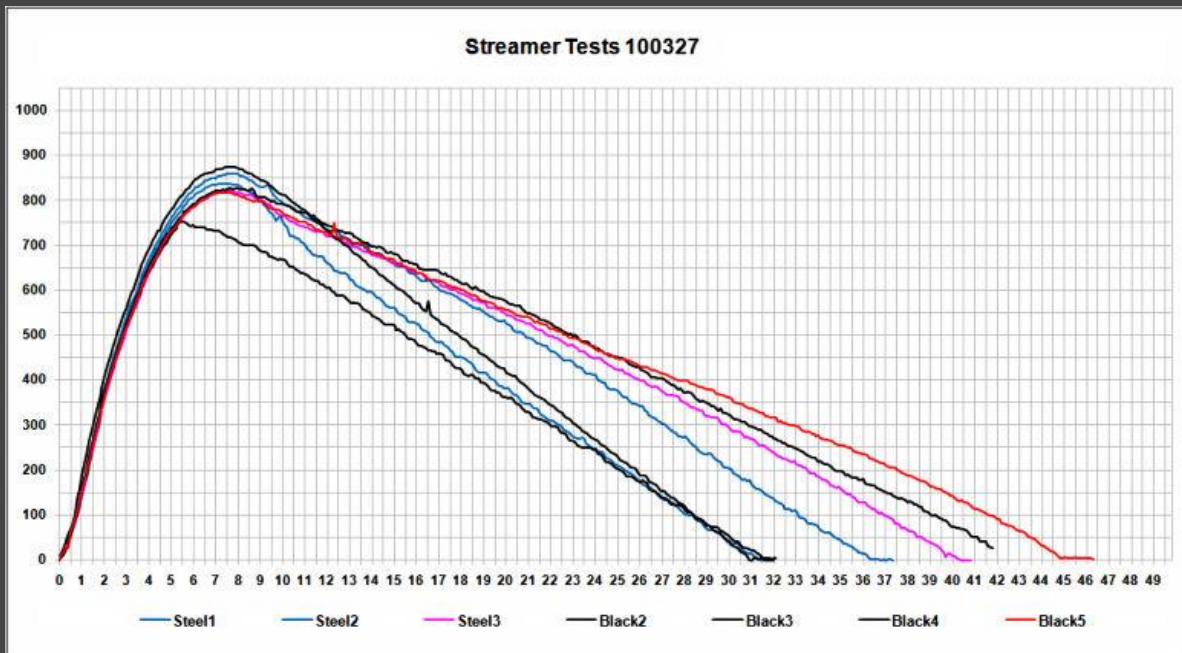
Initially, we had success reaching 825ft but not descending slow enough. We increased the cargo unit size and added streamers to slow descent

We used an Aerotech F32-4T for most of our launches. We tried a F32-6T and had a major KATO, which was determined to be a manufacturing problem. It turned out the F32-6T was used for the final qualification launches to delay ejection a few seconds.



Problems/Solutions

We used a cyclic process to refine our rocket and streamer solution. We recorded our launches and mapped them out using Excel spreadsheets. We videoed our launches so we could review them. After every launch we conducted an analysis session and planned modifications for the next launch.



Lessons Learned

- You need to test early and often.
- You have to launch when you can.
- You need a lot of streamer material to get a slow descent rate.
- You need to get data from every launch to make meaningful adjustments.



Teamwork

Our team is all high school seniors. This is our fourth year participating in TARC. We have all been to a National Fly-off before. Initially, we worked with our other teams to get them going and share our experience. We decided to form our own team so our senior year would be memorable. And it is!

