inVenTs High-Power Rocketry

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Flight Anomalies Analysis

Unfortunately, during the competition launch on May 20, the inVenTs High-Power Rocketry Team was unable to successfully recover the rocket. Although the rocket launched beautifully, and more than likely performed the required functions properly, the parachute failed to deploy causing the rocket to slam into the ground and shatter into a thousand pieces. Figure 1 shows the remains of the rocket.

Although there is no way to tell for certain, the parachute deployment failure was likely caused by a wiring issue between the stratologger and the ejection charge or the stratologger itself. As a result of the safety inspections on Saturday night, the ejection charges had to be rewired to the stratologgers through the outside of the rocket body. Previously, the ejection charge was wired directly to the stratologger without a key switch or alternative way to arm it on the launch pad. By wiring it through the outside of the body tube, it was possible to arm it on the launch pad thus making it considerably safer. This is likely where the error began.

On Sunday morning at the launch, it was discovered that only one of our stratologgers was working. Ordinarily, the team would not have launched with one stratologger as it is a large risk, however, there wasn't an alternative option. Permission was received from the RSO's to launch with one stratologger and the pre-launch procedure was continued. The correct amount, 5 g, of black powder was placed in the ejection charge cap and properly sealed. After the rocket was set-up on the launch pad, the stratologger beeping sequence was checked and the rocket was ready for launch.

As previously stated, although there is no way to tell for certain where things went exactly wrong, everyone on the team learned an important lesson in preparing better prior to launch. Had our ejection charge/stratologger arming system been set up properly to begin with, we would have had more time to make the appropriate changes and check to ensure both stratologgers were working in advance. In the future, this team will be much more prepared to handle unexpected setbacks.

Figure 1. The rocket remains after launch.

Figure 2. The team with the rocket before launch.