

Date: 3/17/2015

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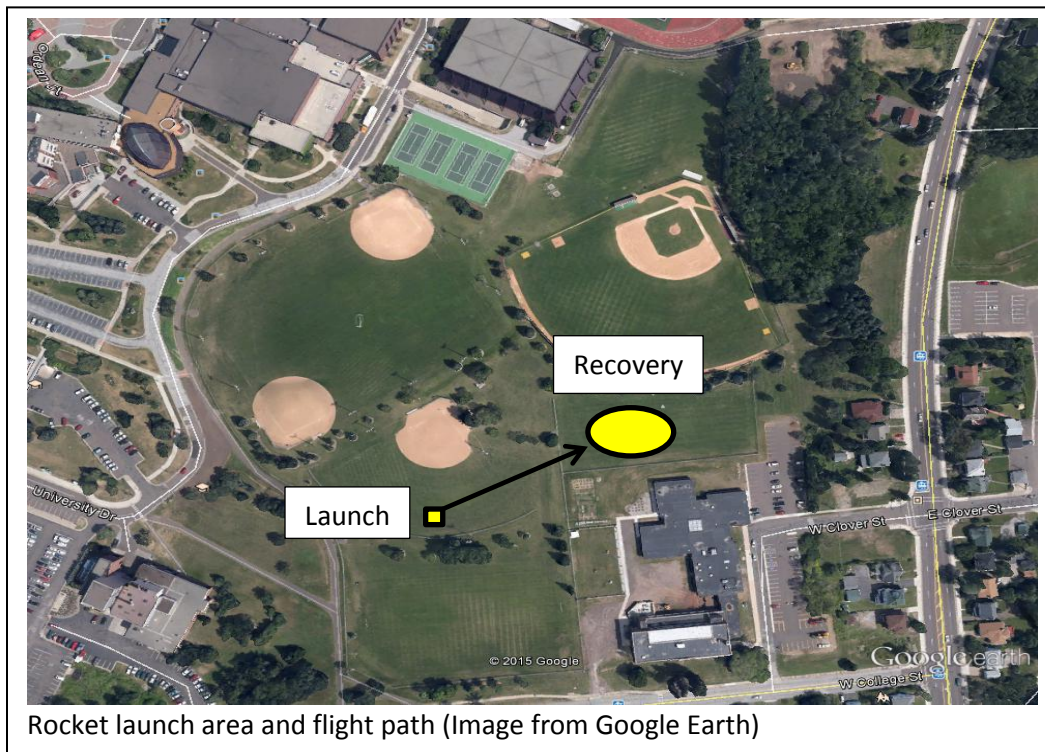
From: Ryan G. Rosandich, Ph.D.
University of Minnesota Duluth "High Power Rocketeers"

Subject: Model rocket construction and launch

Please see the following pages for documentation of our model rocket construction and launch, as required by the 2015 Midwest High Power Rocketry Competition.

Three Estes Alpha rocket kits were purchased with three B4-4 and three A8-3 engines. The rockets were assembled by the team during the week of Feb. 2. The rockets were launched at the athletic field complex on the campus of the University of Minnesota Duluth at approximately 8:00 am on March 10, 2015. For each launch an igniter was installed in the engine, the rocket placed on the launch rod, and the igniter connected to the electrical leads. A 12 VDC marine battery was used to provide the power for ignition.

The rockets launched slightly off of vertical, and appeared to reach altitudes of 300-500 feet. The parachutes deployed but did not appear to fully open, possibly due to the chilly conditions. The rockets landed 150-250 feet from the launch site in an adjacent field (see map below), and all three were recovered safely. Photos of the rocket construction, launch, and recovery can be seen on the following pages.



Model Rocket Construction



Rocket one



Rocket two



Rocket three

Model Rocket Launch

Launch Conditions	Rocket specifications
March 10, 2015 8:00 am Weather (Weather Underground) Temp. 36 deg. F. Wind WSW 12 mph Barometer 29.76 Overcast Visibility 10 mi.	Estes Alpha (3 ea.) Estes A8-3 and B4-4 engines 12 in. chute

Launch Photos



Ready for launch!



The team at the launch site.



The team with three recovered rockets.