FOUR MONTHS AGO...

A group of twelve students with a short time frame and no prior knowledge of rocket science set out on the ultimate goal of launching a rocket to 10,000 feet at the IREC competition.

SENDING IT UP

The first challenge in our rocket design was selecting the proper solid fuel mixture. Based on George P. Sutton's book, Rocket Propulsion Elements, the WSU Rocket club, and professional recommendations, we decided to use a fuel blend of 12% HTPB 68% Ammonium Perchlorate and 20% Aluminum. Due to a lack of experience with mixing solid fuels, we decided to purchase our motor from a supplier, along with a casing for that motor. The motor that best reflected the desired fuel blend was the L2200G by Aerotech with the RMS 75/5120 casing. This reloadable system allowed us to launch our rocket multiple times.

REDUCING THE DRAG

The nose cone design began by looking at the plot shown to the right. The plot was generated from an experiment done for NASA’s Sugar Shot to Space by Vicente Alvero Zambrano. This plot compares the different nose cone shapes’ drag coefficients against their Mach number. At our desired Mach number (0.98), the best nose cone shapes are the Tangent Ogive and the Power Series. Using a table of metrics, we decided on the Tangent Ogive shape.

If All Else Fails, SOLID ROCKETS WILL PREVAIL!

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