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PEAK OF FLIGHT

NEWSLETTER

What does "Better" Mean?

By Tim Van Milligan

I get a lot of younger rocket scientists that use RockSim to perform science fair experiments. Over and over again, they say that by modifying variable X or Y, the rocket flew "better."

What does "better" really mean? When I ask them, they nearly always tell me that "better" means that the rocket flew higher.

This got me thinking about some of the performance problems I've been working on in my spare time. Have I really defined what is "better?" Defining "better" should be done before you attempt to solve the problem. Unfortunately, I realized that I haven't been doing this.

For example, over the past several years, I've been consumed with finding a way to determine the minimum lift-off speed of a model rocket. Most times, we assume that the minimum lift-off speed is approximately 30 miles per hour. But is the minimum? If the speed is slower than 30 miles per hour, I've assumed that it is "better."

It hit me today that I haven't really defined what is "better."

When a rocket lifts off slower, it can do almost anything. We'd like it to clear the rod, and continue on a straight path upward. But if there is any wind, the rocket is going to have a altered flight path.

The point is, how much of an altered flight path is acceptable? If we can define that, then we can say that any flight that takes off slower and still is within the allowable flight path is better.

If you look back at the series of articles on Maximum Lift-Off Weight (Newsletter 33)), we finally concluded by defining a set of criteria as to what is acceptable. Then if the rocket was heavier and still flew within those criteria, we said it was 'better.' That is what I'd like to do with minimum lift-off speed. We need to sit back and define what criteria is acceptable, so that we can find the lower flight speeds.

My point of this article is to solicit advice and comments from you the readers about minimum lift-off speed. How much of a modified trajectory is acceptable? At what wind speed?

Please send your comments and suggestions to me, and I'll compile them together and let you know if there is a general consensus among modelers.

About the Author:

Tim Van Milligan is the owner of Apogee Components (http://www.apogeerockets.com) and the curator of the rocketry education web site: http://www.apogeerockets.com/education. He is also the author of the books: "*Model Rocket Design and Construction," "69 Simple Science Fair Projects with Model Rockets: Aeronautics"* and publisher of the FREE e-zine newsletter about model rockets. You can subscribe to the e-zine at the Apogee Components web site, or sending an email to: ezine@apogeerockets.com with "SUBSCRIBE" as the subject line of the message.

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