

Space Grant 2015-2016 Midwest High-Power Rocketry Competition – the “Active Drag Challenge”
Q & A from Introductory Telecon on Sept. 22, 2015 (and e-mail correspondence prior to that)

Q1. Are we allowed to bring two identical rockets and launch one for the first flight (drag-system-disabled) and the other for the second flight (drag-system-enabled)?

A1. No. The point of the challenge is to fly the same rocket twice. If you want to build and bring a spare rocket, that is fine. But you would only fly it if the original rocket failed to accomplish its two flights successfully, in which case the spare rocket would then need to be flown twice itself.

Q2. How similar in weight does the rocket need to be between the two flights?

A2. The expectation is that you fly the same rocket twice, so there is no reason for the weight to change (except for tiny differences in weight between “identical” motor reloads, for example). If you are using wadding for parachute protection, you should weigh out the same amount of wadding for both flights in advance. If you want a specific target figure, assume the rocket should not change in weight by more than 1 ounce between the two flights.

Q3. Why is there a “1 hour prep time” requirement for each rocket flight?

A3. We need to ensure that rockets are prepped quickly (but safely, of course) so that we can get in twice as many flights as there are teams while the launch window is open. Rockets will not be disqualified if they are late, but there will be point deductions (and once the launch window closes, that is it). Wait time in the RSO line will not count against the 1-hour time clock prior to each flight. Teams will definitely want to practice prepping their rocket (probably more times than they actually test-fly it) to ensure they can accomplish this within 1 hour.

Q4. Do winners of the competition receive prizes? Also, are team expenses paid by their state’s Space Grant?

A4. There are no centralized prizes offered, just bragging rights. Teams are required to be in touch with their state’s Space Grant (for reporting purposes) and some Space Grants might promise support (financial or otherwise) to their state’s teams and possibly even prizes, if they do well in the competition.

Q5. Where will the competition be held?

A5. Our plan is to fly out of the Tripoli MN launch site (on sod farms) just NE of North Branch, MN, as we done for the past two years. If weather on the primary launch date is problematic we will either move the launch to the alternate date (the following day) or, if need be, may try to shift launches to another Tripoli MN launch site in southern Minnesota. Hotel spaces and presentation venues are expected to be in and around North Branch, which is about a 1 hour drive north of Minneapolis/St. Paul.

Q6. What happens if the competition-provided Altimeter Two fails to collect data?

A6. Teams should practice with an Altimeter Two in advance – we can lend you one if you like – to ensure they know how to use it correctly. Rockets need to be designed so the competition Altimeter Two can be armed prior to flight and the data downloaded after flight easily. If the Altimeter Two genuinely fails, competition organizers will consider using data from your commercial altimeter and/or your non-commercial data-logging system to provide the judges with what they need (mostly peak altitude).

Q7. Are we allowed to eject parachutes and/or break the rocket open (or otherwise destabilize it) during ascent, as a means of increasing drag?

A7. Any devices deployed to increase drag must be fully stowed prior to reaching apogee and the recovery parachute(s) may not be deployed prior to apogee. Thus, technically, you could deploy a small parachute during ascent if you (a) reel it back inside the rocket prior to apogee and (b) use a different parachute as your primary recovery device. Breaking the rocket open or destabilizing it (intentionally or unintentionally) on ascent would violate the rule that the rocket must remain stable, with a static margin between 1 and 5, during the entire ascent, with drag system both disabled and enabled.

Q8. What are the altitude targets for the competition?

A8. The rocket needs to reach at least 3000 feet above the ground on the first flight (drag-system-disabled) then aim for 75% of its original apogee on its second flight (drag-system-enabled). Rockets that fly higher than 3000 feet will be given modest bonus points (but will need to go faster and hence may be harder on the drag system). Rockets that don't even reach 3000 feet will lose points. Rockets that don't reach 2000 feet will essentially be disqualified (for flight performance points, though they can accumulate other points in the competition).

Q9. Do we really need to build and fly a model rocket if our team has members with high-power rocketry experience?

A9. Teams consisting of students who all have high-power rocketry experience may request a waiver of this requirement. Teams with some experienced members and some students who are new to high-power rocketry should have the new students (at least) build and fly a model rocket (or a non-competition high-power rocket, if you prefer). We recommend you get right to that – the due date is March 18, 2016, but mid-March might not be a particularly good time to go out and fly such a pre-competition rocket.

Q10. Do we need to do test flights of the actual rocket prior to the competition?

A10. Yes. At least one test flight, with drag-system-enabled, is required and points will be assigned to discussing results of test flight(s) in the Flight Readiness written and oral presentations. Doing more than one test flight, early enough that the rocket can be repaired/improved if things don't go well, is strongly encouraged. Rockets that have not had any test flights, or any successful test flights, may still be flown at the competition, but there will be point deductions in the reports in that case. Beware – test flights often don't go as planned and weather in the spring might not cooperate, so set your schedule accordingly!

Q11. Why do teams need both a faculty adviser and a high-power rocketry mentor and can they be the same person?

A11. Since this is a collegiate team activity, Space Grants require a faculty adviser through whom reporting (and more) will be done. Teams, even those with experience, also need a mentor with high-power rocketry experience (at least Level 2 certification) to bounce ideas off of and to arrange for pre-competition safety checks. If the faculty adviser has high-power certification (at least Level 2), they may serve in both roles. Teams that do not have high-power connections should contact Gary Stroick, Tripoli MN technical consultant to this competition, for assistance in finding a mentor. The faculty adviser and the rocketry mentor are welcome to attend the actual competition, but are not required to do so.

Q12. Who will judge the competition?

A12. Judges from academic and/or industry will be provided by the Space Grants of states entering more than one team in the competition. States may bring their judge to the competition with them, or arrange with Gary Stroick to find someone in Minnesota (associated with Tripoli MN) to serve as their contributed judge. Judges will evaluate written and oral reports, though not necessarily the flight event. Judges need to be identified by January 31, 2016. Judges' travel expenses are typically paid (at least).