Q and A about the Midwest Space Grant 2014-2015 High-Power Rocketry Competition
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1. Where do we pay the registration fee?
A. The $400 team registration fee is due by January 30, 2015 to the following website, run by the National Space Grant Foundation (NSGF). https://secure.spacegrant.org/payments/ On the form for "Item" select "Other – Please Specify" then type "Midwest Rocketry Competition" in the text box that appears. Put that same text in the "Memo A" box so it also appears explicitly on your payment receipt. If you have questions/issues about payment options, contact Shirley Campbell <campbell@spacegrant.org> (and copy James Flaten <flate001@umn.edu>).

2. How will a "down-looking" camera view be defined?
A. To distinguish a "down-looking" camera from an "out-looking" camera that just happens to have a very wide field of view, use the following empirical definition. "A down-looking camera will be defined as one in which the launch pad directly beneath the rocket (while in vertical flight) appears in the center 1/9th of the image if the image were to be divided into 9 equal sections by two vertical and two horizontal lines." Note that it is also acceptable to use optical components to redirect the camera view, potentially allowing a sideways-oriented camera to be used to record look-down footage. The lower end of the rocket will obscure the down-looking view somewhat – this is to be expected.

3. Is a booster allowed to deploy mechanisms (air brakes or other things) to assist with vehicle separation and/or to prevent it from going very high, just as long as the booster does not eject its main parachute until after apogee?
A. The handbook says, on page 4, that "ejection events are not permitted during booster ascent" so you may "deploy" something (like air brakes) but not "eject" something (like a parachute – not even a drogue chute – nor explosively force separation of the booster from the dart (that would violate the "don't impart momentum to the dart" restriction) nor explosively separate the booster into pieces to slow it down) before apogee.

4. The handbook, on page 4, says that the booster by itself must have a static margin of one or greater. Does that apply all the way to apogee or may we intentionally de-stabilize the booster after separation as a means of preventing it from going very high?
A. The stability condition is a safety rule and applies to the booster + dart (from launch to burnout), to the dart alone (post separation, all the way to apogee), and to the booster alone (post separation, all the way to apogee). Safety decisions (associated with stability and more) will be made by the launch-site judges. If need be the judges may use "instant replay" (i.e. ground video footage of the launch and/or on-board footage from the rocket itself) to assist them in making their decision. Rockets (or parts thereof) that go unstable during ascent, even unintentionally, will be subject to disqualification on safety grounds even if they aren't actually damaged.

5. Are rockets disqualified if they don't fly exactly as planned?
A. Not necessarily. However rockets will be disqualified (and receive 0 points for their Flight Performance score) if they do not fly safely. A safe flight is one in which the rocket (a) flies vertically (i.e. comes off the rail at an adequate speed), (b) flies stably (all parts, all the way to their respective apogees), (c) deploys recovery systems (both parts), (d) descends at a reasonable

speed (both parts), and (d) is deemed flyable after landing and recovery. Notice that rockets that fail to separate during the ascent will not necessarily be deemed unsafe (if they perform well otherwise). Similarly, rockets that deploy their recovery systems by back-up rather than primary means may still be classified as safe. There will be 15 (out of the 100) points in the Flight Performance score associated with having a "safe flight" – the rest of the points will be based on satisfaction of the competition goals. There will be point deductions taken off in the reports, but not disqualification at the competition flight itself, for other (possibly pre-planned) "failures" like taking "out-looking" rather than "down-looking" video, embedding the camera so deeply inside the rocket that you only get post-separation video, not collecting all the sensor data requested, etc. A more-detailed, less-generic "Flight Performance Reporting Sheet" and an updated "(Competition Flight) Scoring Formula" will be circulated presently. Note – even if their rocket is disqualified during the competition flight, a team can still earn a lot of competition points since only 30% of the final score is based on Competition Flight Performance (see page 3 of the handbook).

6. How will a rocket be judged if the competition-provided Altimeter Twos fail?
A. We intend to distribute Altimeter Twos (at least one to each team) by mail in advance of the competition so that teams can practice using them during test flights. If one actually fails during a competition flight, it will be up to the discretion of the judges to determine the culpability of the team (if any) and how to proceed with scoring. Since all darts (and some boosters too) will have their own altitude-logging altimeters, the judges may elect to use that altitude data instead if Altimeter Two data is unavailable for any reason. Beware: Altimeter Twos have a "time-out" feature (set for 20-30 minutes) so it is best to design your rocket so that they can be armed/re-armed easily just before launch. Don't bury them too deeply! Be sure part of the rocket in which they are located is vented appropriately as well.