SMS

Sonde Martienne Suspendue
(Hovering Mars Probe)

RENDEZ-VOUS ESPACE ETUDIANTS

Technical Challenges 2008

Specifications

I. Context

Year 3958 on Planet Earth: thanks to the challenge organized by the JEDIS (Joined Earthlings for a Development in Interstellar Spaceships), the CNES and Planète-Sciences, the earthlings now have a reliable way to land on Mars.

In order to set up an environmental-friendly base on Mars, they now have to master transportation on the planet. The transportation shall of course be:

- Reliable;
- Fast;
- Environmental-friendly.

The JEDIS have called on the CNES, Planète-Sciences and young earthlings once again, this time to create the SMS (Hovering Mars Probes).
Your mission, should you choose to accept it, is to realize a new probe able to transport scientific equipment, communicate with the headquarters and get around, as well as being original. The vehicle shall be of the hovering type. This means it will be suspended below a weather-balloon.

II. Goals

The main purpose of this challenge is to design and realize a vehicle able to detect an obstacle while transporting a fragile object. For the occasion, we'll use an egg (from an earthly hen). When the obstacle (steel plate) is reached, the vehicle shall send a signal to notify the end of the displacement and then turn around.

III. Approval requirements

1. Size

The vehicle must fit in a cube of 50cm edge cube. If the vehicle has any removable, telescopic, moving or any other type of appendix, the total must fit in a cube no matter of the appendix position.

2. Mass

The mass of the vehicle must not exceed 300g. The mass variation mustn't exceed 50g during the race.

3. Power source and hardware

The power source used to displace the vehicle must be renewable.
Any kind of battery or accumulator is forbidden.

4. Suspension to the balloon and the trim cable

Your SMS must be equipped with two loops and swivels: the first one on top of the vehicle, the other under it. The upper look will be connected to the balloon (200L of helium) by a rope, the lower to a trim cable of 20g/m. The balloon, cables, loops and swivels will be supplied by Planète-Sciences, directly on site.

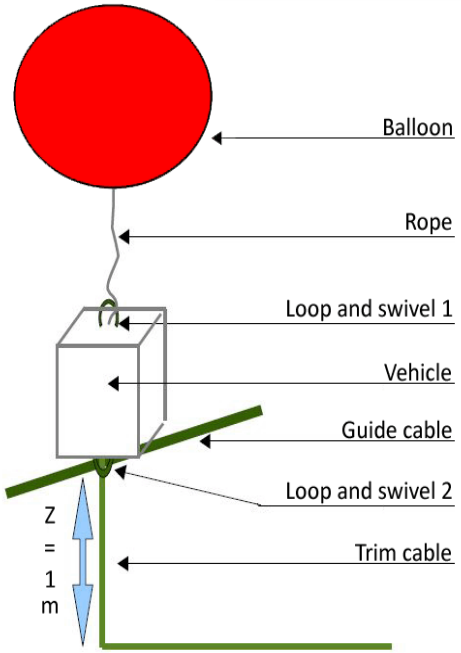
5. Rope guide

Each vehicle will be guided by a rope going through the lower loop (below the swivel). In this way, it can only move forward, backward and turn around.

6. Number and logo prop

A 15 x 15 cm slot shall be free to carry Planète-Sciences and CNES logos as well as the team number.

7. SMS Scheme



IV. Challenge organization

1. Timetable

Thursday the 31st of July (2pm):

- Attendees reception;
- SMS Controls and prequalification.

Saturday the 02nd of August (2pm):

- End of controls;
- Race.

Saturday the 02nd of August (6pm): Award ceremony.

2. Progress of the challenge

a. Control and setting up of the egg

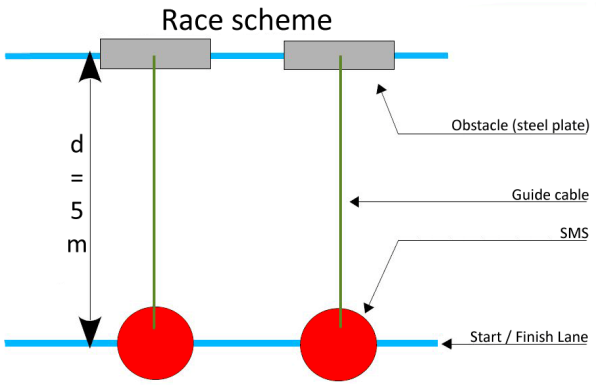
All the probes will be brought together in order to be connected to their balloon. A control will then determine the conformity to the specifications. The eggs will be placed after this step.
Each SMS will be brought to the start line and be maintained by only one team member

b. Progress of the race

The SMS will be confronted in races of two opponents that would previously have been selected by a random draw.
Each time the whistle is blown, two SMS will be released and the timer will start.
For each round:

- The loser will be stumped;
- The winner will qualify for the next step.

The competition will keep on going until there are only two vehicles left for the final round. Another round will determine the third place.



c. General rules

The race is won by the vehicle which obtained the biggest amount of points. Examiners will be in charge of the count, following this grid:

- The SMS turned around: 7 points;
- First arrived at the obstacle: 6 points;
- A signal for the obstacle detection has been sent: 5 points;
- The egg is unbroken: 5 points;
- Most original vehicle: 4 points;
- The SMS has a name: 3 points.

If a SMS stops for more than 4 minutes, it will be removed from the race in the end of the round.
After each round, an examiner will check on the egg.

V. Award ceremony

The three first teams will receive an award.

VI. Contacts

If you need any more information, check the forum:

www.planete-sciences.org/espace/forums