



Delaware Technology Student Association

2010 - 2011

MAGNETIC LEVITATION VEHICLES

Delaware Only Competition

*"SERVING TECHNOLOGY EDUCATION STUDENTS"
SPONSORED BY THE DEPARTMENT OF EDUCATION*

MAGLEV VEHICLE RACE

Overview: Delaware TSA students entering the Maglev vehicle race are required to design and construct a vehicle which will levitate and balance over a 16 foot long magnetic track and will be moved down the track by a D. C. motor with a propeller. (The track sides are electrified by an 18-volt transformer.) Students will be judged on time trial results, originality of design and aesthetic value.

Written Report: Each student must submit a 200-300 word letter in the style of a "letter to the DelDOT Secretary of Transportation" stating your position and supporting it with convincing reasons why a Maglev transportation system that runs from Wilmington to Rehoboth Beach would be beneficial based on the following writing prompt.

- **Writing Prompt:** The State is considering plans to improve transportation, reduce emissions and increase tourism in Delaware. The Delaware Department of Transportation (DelDOT) planners are considering Maglev Technology as an option. Write a letter to the DelDOT Secretary of Transportation stating your position and supporting it with convincing reasons why a Maglev transportation system that runs from Wilmington to Rehoboth Beach would be beneficial.

Contest Purpose: To provide a means for TSA members to demonstrate their understanding of a practical application of magnetic levitation through the design and construction of an original Maglev vehicle within a set of track/vehicle specifications. The contest rules and specifications will be based on the Maglev competition guidelines (attached).

Eligibility for Entry: One Maglev Vehicle per individual student.

Levels of Competition: Level I and Level II.

Time Limitations: Home School Preparation. Vehicle and written report (based on the writing prompt) must be submitted during event registration.

Specific Regulations:

- a. Vehicle shall be suspended solely by means of magnetic levitation. Conductive wires may not rest on the top or the rails.
- b. Vehicles must be at least 1.5" tall and 12" or less in length.
- c. There is no maximum height, nor minimum length restrictions.
- d. The magnetic polarity must be compatible with track specifications.
There is no limit to the number of magnets which may be affixed to a vehicle.
- e. Students will be allowed to adjust and place magnets to track magnets at competition site prior to initial track competition.
- f. The track will be 16 feet long (14 ft race length) and powered by a 12 to 18 volt transformer. See included diagram for track specifications.
- g. Vehicle must be powered by one DC motor as available from such vendors as Kelvin, Pitsco, Radio Shack, etc... and one propeller (Example is a **Kelvin #850647 3-6v 17,000 rpm motor**). Power must come completely from the electrified track.
- h. Once competition begins, after testing phase is over, no repairs and/or modifications can be made. If a vehicle becomes inoperative, it will be eliminated from competition.
- i. Body material is to be supplied by contestant. Choice of material is the option of the contestant.

Delaware MAGLEV Track Specifications

Side View

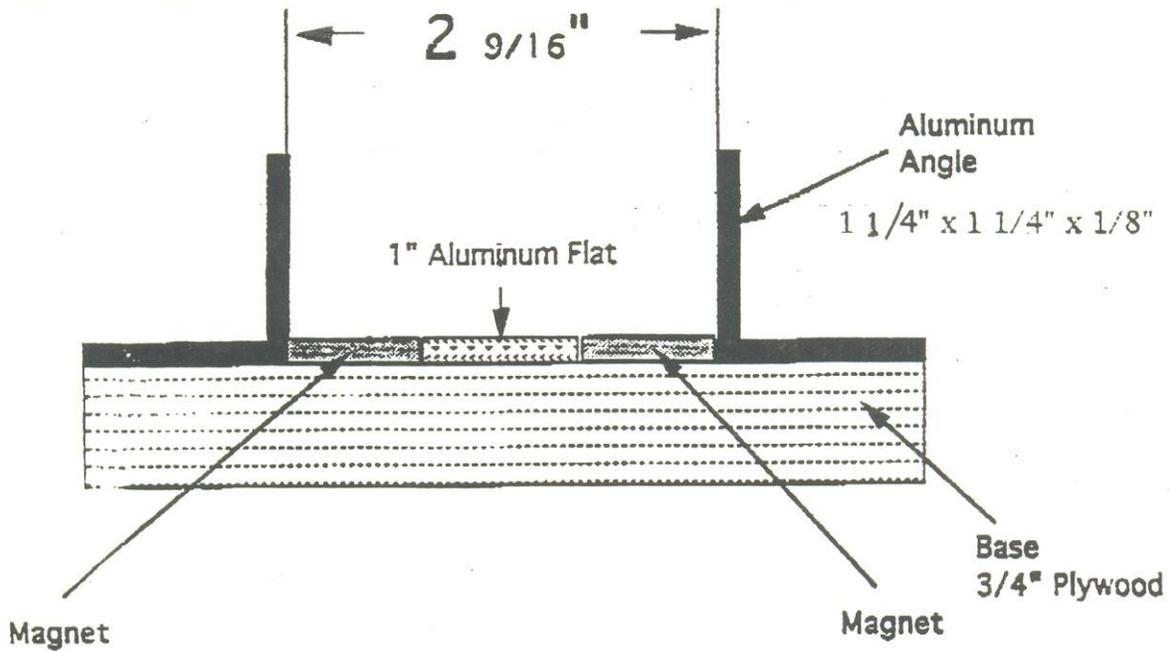


Diagram 5.4 - 2.1

Top View

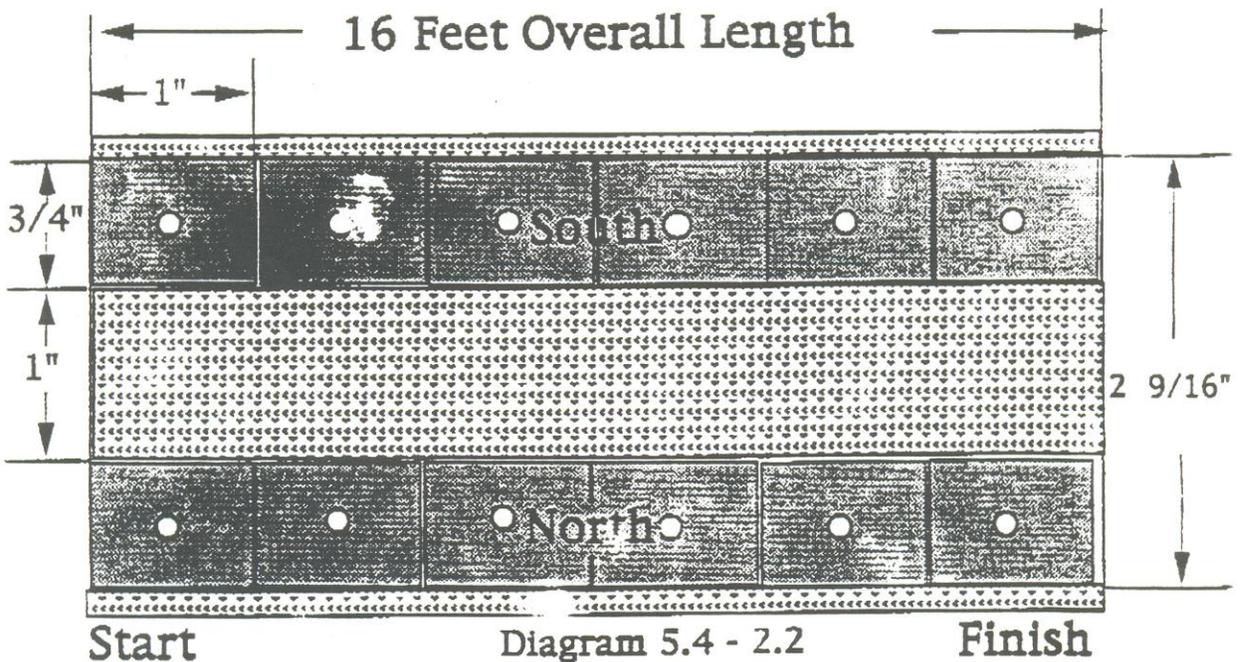


Diagram 5.4 - 2.2

**DELAWARE TSA STATE CONFERENCE
Competitive Event Evaluation**

MAGLEV VEHICLE RACE

Student's ID: _____ Level: _____

Chapter/School No. _____

A. _____ ORIGINALITY, DESIGN, & APPEARANCE (25 pts)

- _____ Design meets all vehicle specifications **10 pts.**
- _____ Originality of vehicle design **10 pts.**
- _____ Overall design appearance & aesthetic value **5 pts.**

B. _____ RACE TIME TRIAL RESULTS (50 pts)

1st = 50 pts. 2nd = 45 pts. 3rd = 35 pts. 4th = 30 pts. 5th = 25 pts.
*If vehicle travels the distance but does not make top five times = 10 to 20 pts.
*Did not finish = DNF (0 pts)

_____ _____ _____ _____ _____
1st time trial *2nd time trial* *3rd time trial* *Average time* *Rank*

C. _____ WRITTEN (based on the writing prompt) "letter to the DelDOT Secretary of Transportation". (25 pts.)

- _____ Masterful Response..... **21-25 pts.**
- _____ Skilled Response..... **16-20 pts.**
- _____ Satisfactory Response..... **10-15 pts.**
- _____ Insufficient Response..... **0-9 pts.**
- _____ No Response..... **0 pts.**

D. _____ RULES VIOLATION (-20 pts.)

_____ **POINT TOTAL**

_____ **RANKING**

Judge's Signature _____