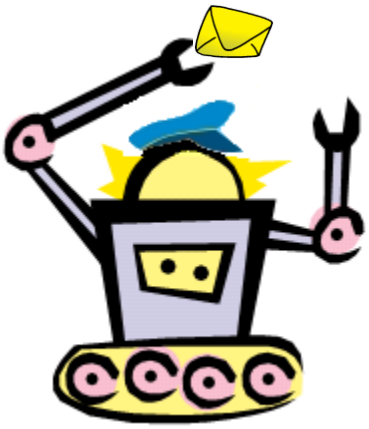
5th Annual

Dufferin-Peel/Peel

Regional

Robotics Competition

You've Got Mail



FINAL VERSON
(FOR NOW)

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Mission Statement

The robotics competition is designed for students enrolled in Computer Engineering, and/or other technological disciplines and enjoys building a machine that functions autonomously.

The students that participate in this challenge will be drawing from several skill sets. The robot requires both mechanical and electrical design. As well, students will be required to program the robot to accept sensory information and respond appropriately so that it efficiently completes the challenges. Also, students must demonstrate good communication skills.

The challenge has been designed so that competitors of all levels can participate and showcase their knowledge and understanding of robotics.

Place and Time

The Forth Annual Regional Dufferin-Peel/Peel Robotics Competition will be held on Friday, May 27, 2011 at John Fraser Secondary School, 2665 Erin Centre Boulevard, Mississauga, Ontario (905) 858-5910. Outlined below is the day's timetable.

Time	Activity
8:30 – 9:00	Registration and Setup
9:00 – 10:30	Competition 1: The Postal Dog Run
10:30 – 12:00	Competition 2: Mailman Marathon
12:00 – 12:30	Lunch
12:30 – 2:30	Competition 3: Mail Route Delivery
2:30 – 3:00	Awards Ceremony

Lunch (pizza and a drink) will be provided for the participants and their coach.

Application Deadline: Thursday, May 12, 2011

Note: A school is allowed to enter two primary teams and one alternate team. If there are available spaces, a draw will be made for those schools that have submitted an alternate team.

Organizing Committee

Paul Lewis, St. Francis Xavier S.S.
Bill Van Hout, St. Joseph S.S.
Heather Lawrie, The Woodlands S.S.
Brad North, Rick Hansen S.S.
Kim Mcewen, John Fraser S.S.
Andrew Motyliwski, St. Aloysius Gonzaga S.S.

Awards

The following awards will be given to the winning robot teams.

- **Postal Dog Run** – by competition
- **Mailman Marathon** – by competition
- **Mail Route Delivery** – by competition
- **Cool Robot** – by judge
- **Another Cool Robot** – by judge

The Challenges

This year's robotic theme is around mail delivery. That is why we have named this year's competition "You've Got Mail." All of the challenges are double elimination. This means your bot races until it has been beaten twice. There will be three challenges.

Challenge One

The first is called "**The Postal Dog Run**" challenge. This is a simple line following challenge where the robot must start at one end of the track and race to the other end of the track, turn around and then race back. The robot must complete the course twice. The front of the robot must start just behind the "T". The winner will be the first robot whose front crosses the starting "T" after the second run.

Challenge Two

The second challenge is called **"Mailman Marathon"**. This challenging course requires the robot to deliver mail the entire postal route. Where there is a single line the robot must make a beeping sound and an LED must flash. This signals that the robot is dropping off mail. The double lines represent a stop sign and if the robot crosses the double lines, it must come to a complete stop. No mail can be dropped. The challenge is for the robot to make all of its drops and return home in the shortest possible time. Please note that the maximum amount of allotted time allowed for delivering the mail is three minutes. As well, there is no prescribed route for the robot to follow. The pathway will be determined by the robot and its programmer.

As the robot is on its route, the judge will place a green sticker every time the robot "drops off mail". Failure to deliver mail at one of the single lines or an accidental drop off of mail will result in ten seconds added to the run time. This will aid in the judging to show that all of the mail has been delivered. Also, if during the run the robot fails to make a stop after it crosses double lines, a red sticker will be placed and ten seconds will be added to the run time. After the robot's run the stickers will be pulled off. Once again, your robot will be competing against another robot on another field, in a double elimination forum. Therefore, the best overall run time wins.

Challenge Three

The third challenge is called **"Mail Route Delivery"**. The objective of this challenge is for the robot to leave its home base and go to the pickup station where the robot must pick up the "mail" (a business card). The pickup station will hold the card so that one inch will be on the block and two and a half inches will overhang the block. See the Appendix. The robot must then read the mail's address and then deliver it to the correct mailbox. The "address" will be acquired by reading the card with its sensors. The code is a follows:

TOP OF CARD

TOP OF CARD

Address 0: Judge – Dennis Cecic, P.Eng

Address 1: Judge – Dave Lunn, B.E.Sc

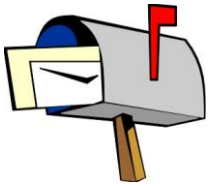
Address 2: Judge – Ryan Pepper, Professor

Address 3: Judge - Jeff Calder,

The mail that the robot must deliver is chosen by a draw. There will be 12 cards, three business cards from each of our four judges. The card will be drawn and placed at the pickup area by the judge once the robot has started towards the pickup area. The card will be placed so that the name is showing and the left hand side will be under the paperclip. See the image to the right.

Once the mail has been delivered the robot will go back to its home base. Again, the first robot back that has completed the challenge gets their time recorded without penalties. However, if the delivery results in the mail missing the box, there is a penalty of 30 seconds. As well, if the mail is leaning against the box, there is a 15 second penalty.

If a judge is required to make a determination, the judge's decision is final.



Design Restraints and Equipment

In order for the competition to remain equitable and to foster an environment of ingenuity and creativity rather than a brawny solution, the following restrictions are in place.

1. The voltage source will consist of four AA batteries. An optional 9V battery can be used to operate the microcontroller.

2. The wheels and drive train will come from Solarbotics http://www.solarbotics.com/main.php and the drive train must have a ratio of 143:1.

3. The footprint (base and wheels) of the robot base may not go over 6½" wide x6½" long. However the end effectors can extend beyond the 6½".

4. There are no weight restrictions.

5. There are no restrictions on the microcontroller that is used on your robot.

6. The choice of any additional motors will be left up to the robot team. However, the microcontroller must be mounted on the robot (not tethered by a cable or wireless).

7. The number and type of sensors used is up to the robotic team. The sensors should be able to detect a black line on a white background.

   The black lines are generated by laying down black electrical tape. The white board is a ⅛" x 48" x 48" white hard board. It is made by Cutler Forest Products and can be purchased at the Home Depot under the product number 0621973. However, other methods may be used at the time of the competition.

8. Support material provided by robot team is:

    - Robot
    - Computer
    - Tools
    - Extension Cord
    - Power Bar

    Support material provided by the organizers is:

    - Table and Chairs
    - Nearby Receptacle

10. Any unforeseen changes by the organizing committee will be emailed to the teams as they are made.

Day of the Competition

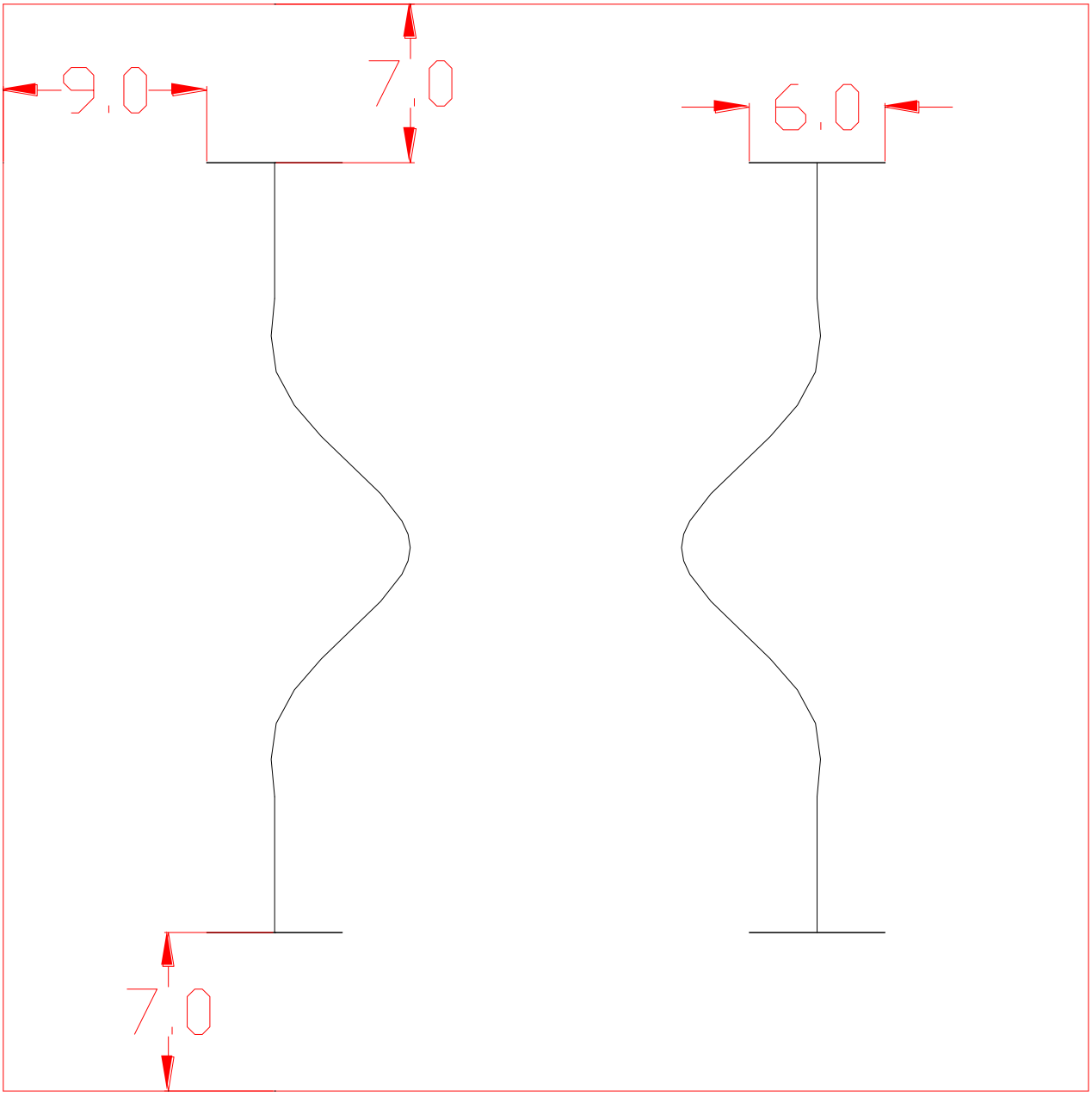
On the morning of the competition there several things that you must do to help make things run smoothly. They are as follows:

1. Go up to the registration desk as a team and sign in.
2. Bring your robot so that the dimensions can be checked. As you know the robot must be no larger than 6½ x 6½, with the exception of your end effector.
3. Make sure you take your ticket for food. No ticket – no food.
4. Put your name tag on. No one likes to be called "Hey you!"
5. Set up your table and prepare for the first challenge.
6. Assign someone to keep an ear out for your competition. You don't want to miss out because you didn't hear it.
7. Lastly, have fun!

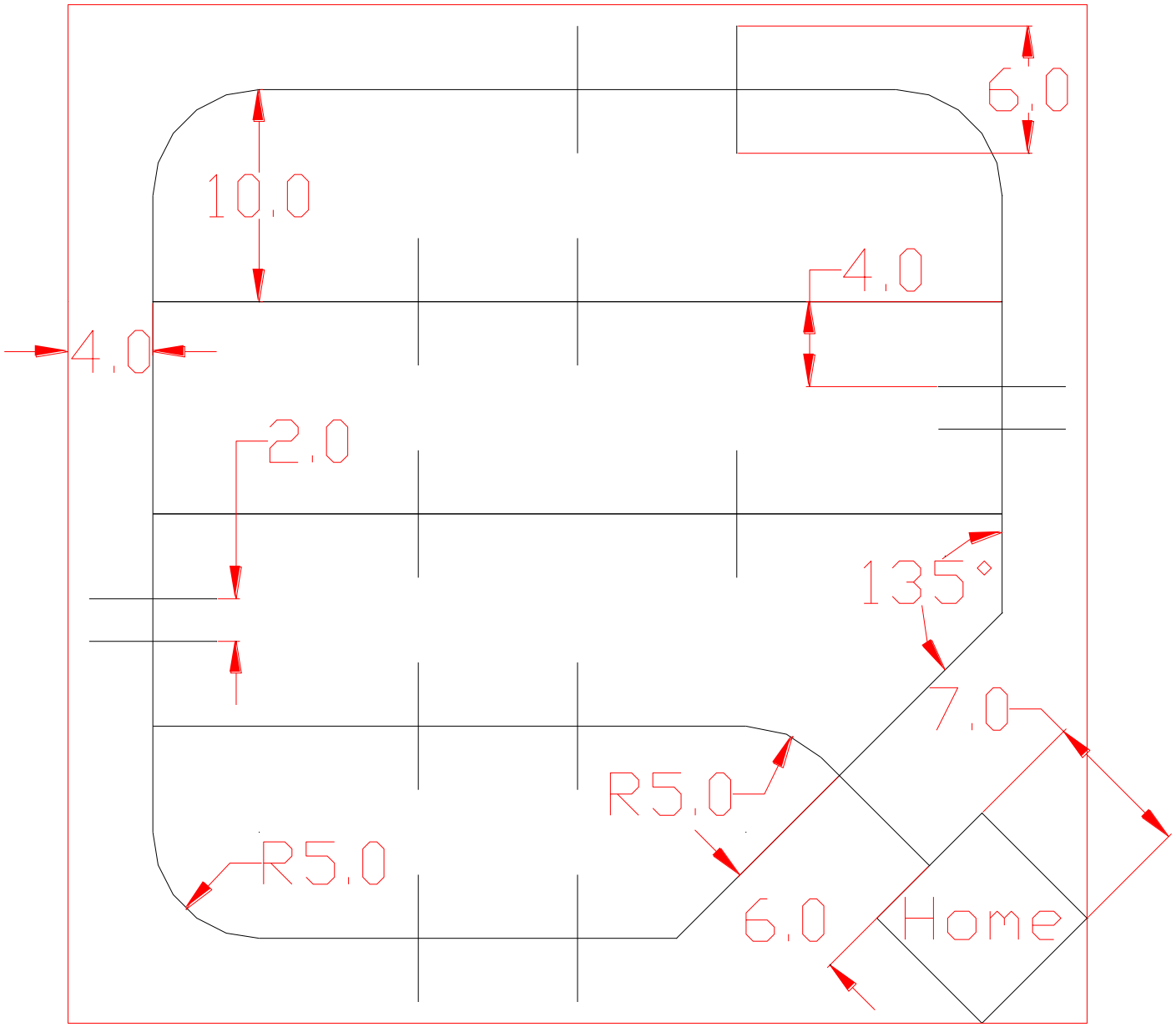
Appendix

The following pages show the layout of all the boards used in this competition.

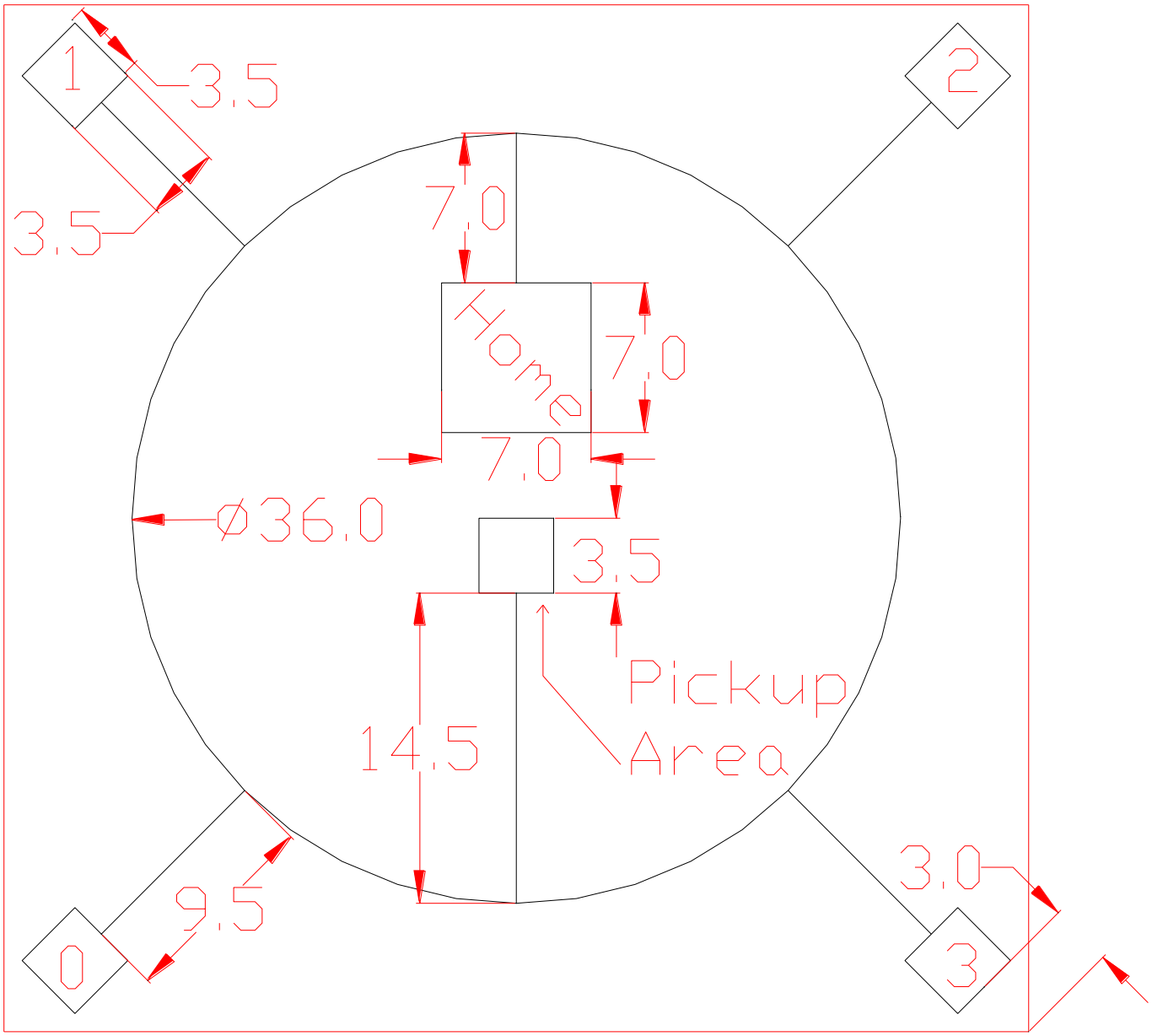
Competition 1: • Postal Dog Run



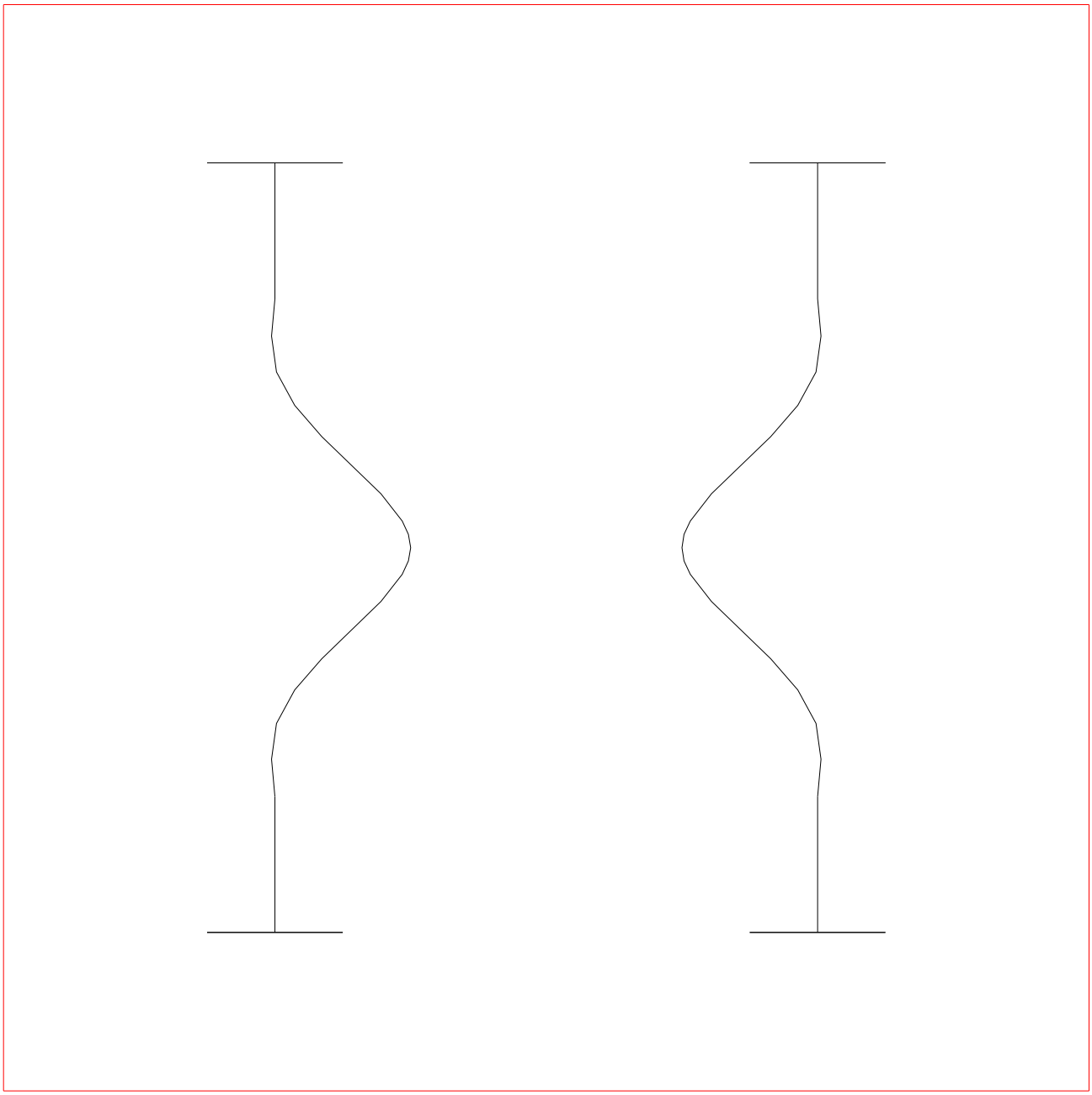
Competition 2: • Mailman Marathon



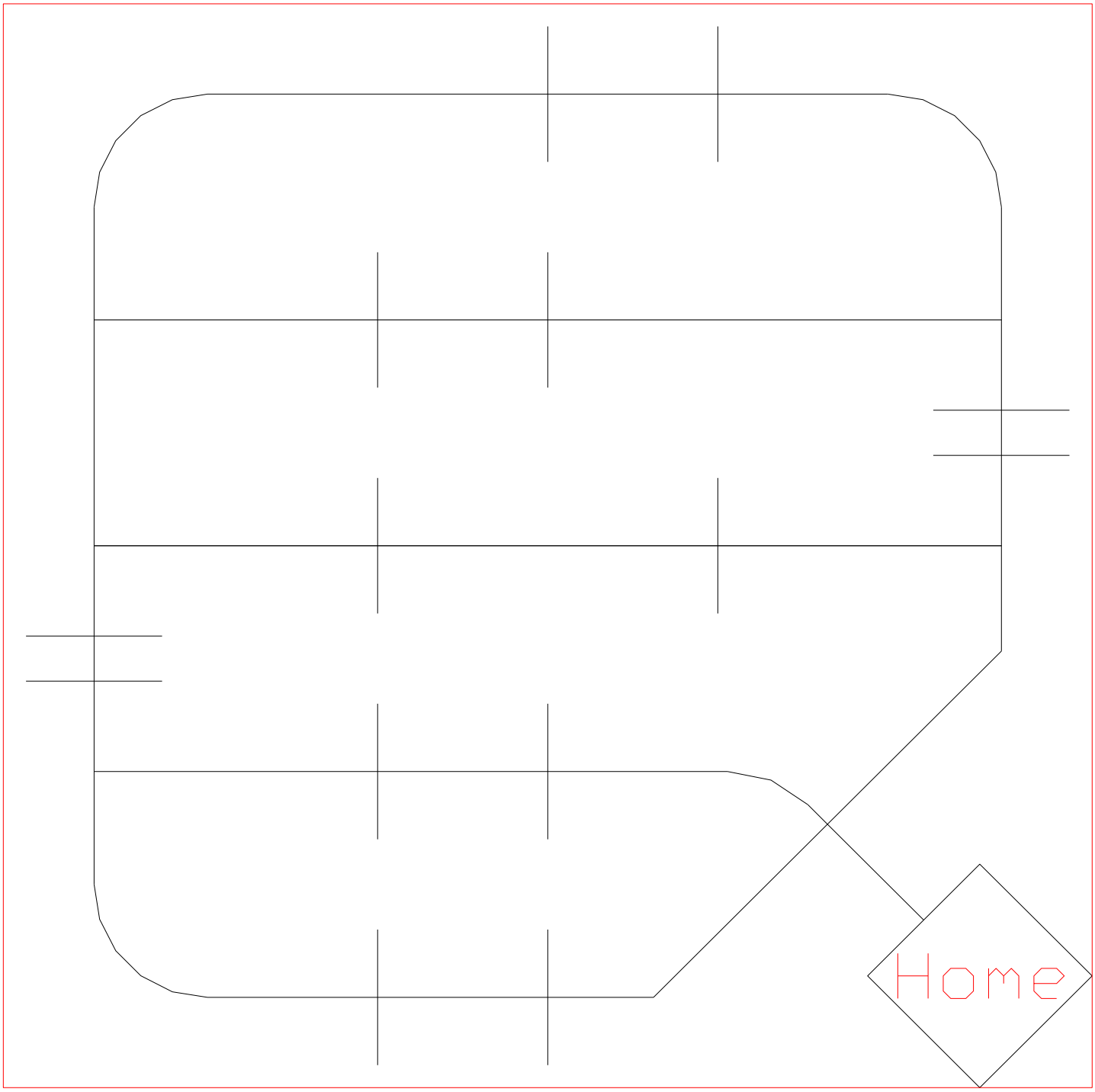
Competition 3: • Mail Route Delivery



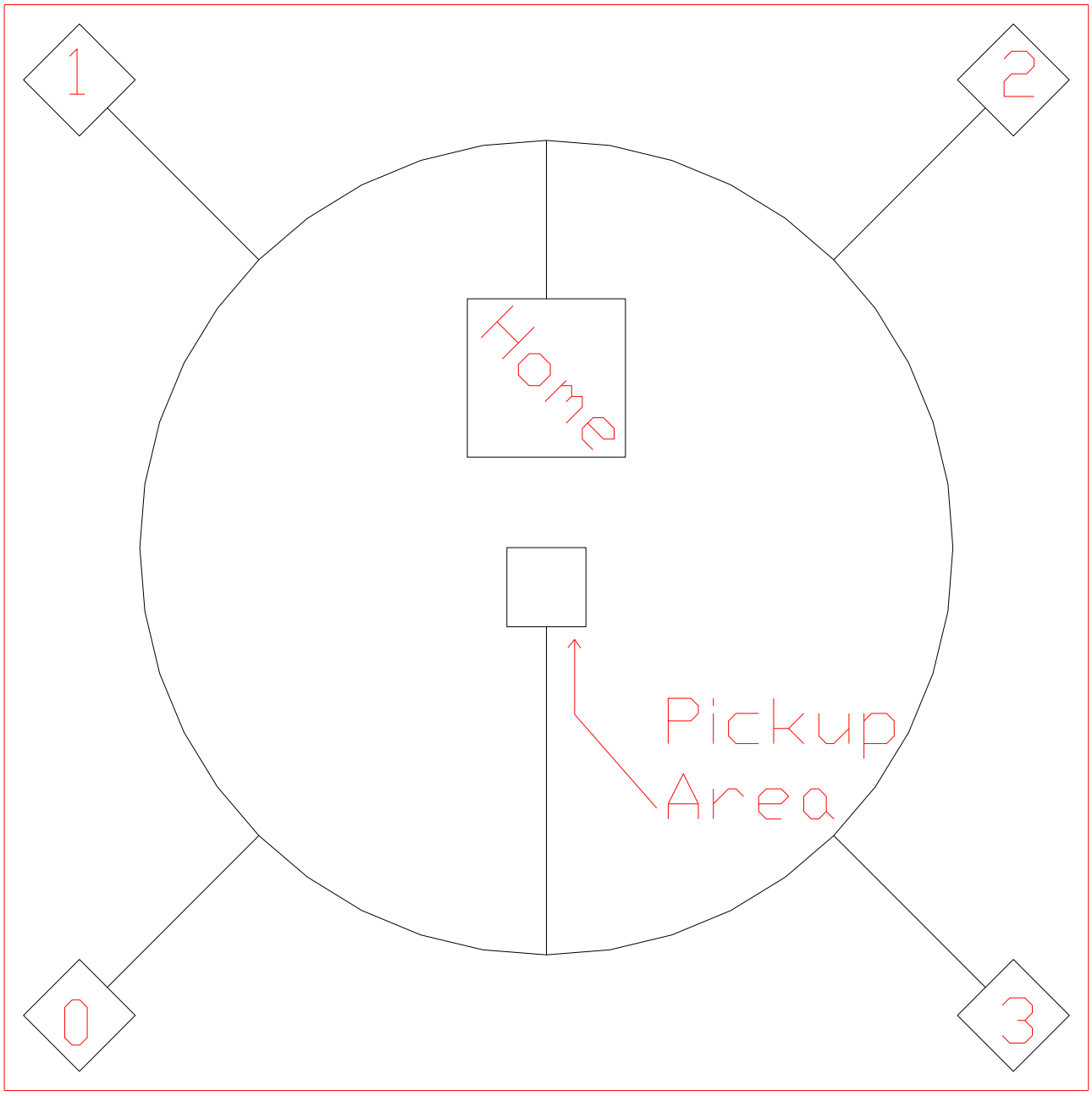
Layout Overheads
Postal Dog Run



Layout Overheads
Mailman Marathon



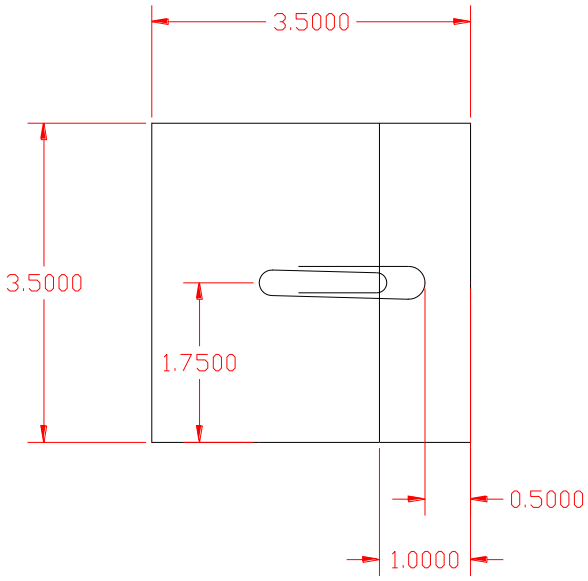
Layout Overheads
Mail Route Delivery



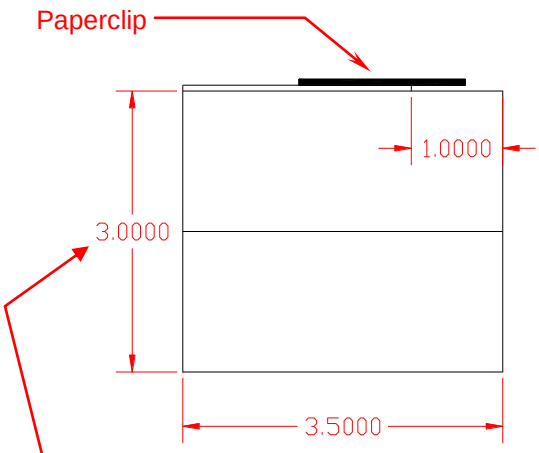
Pickup Block

Mail Route Delivery

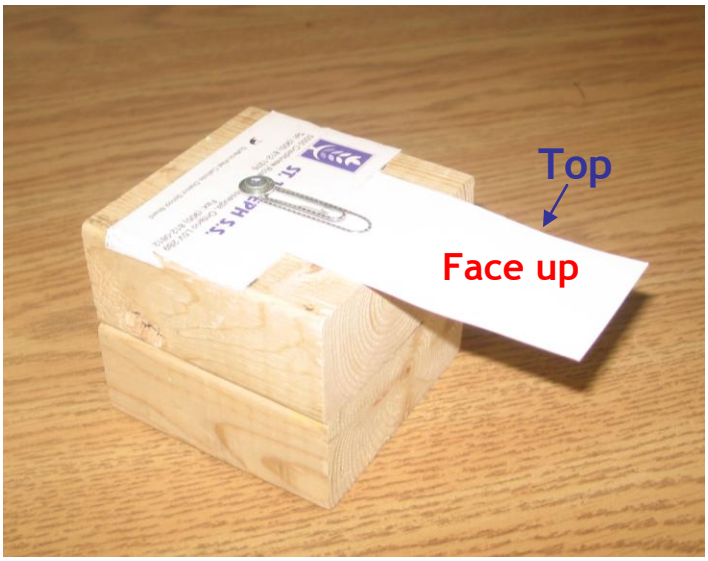
Top View



Side View



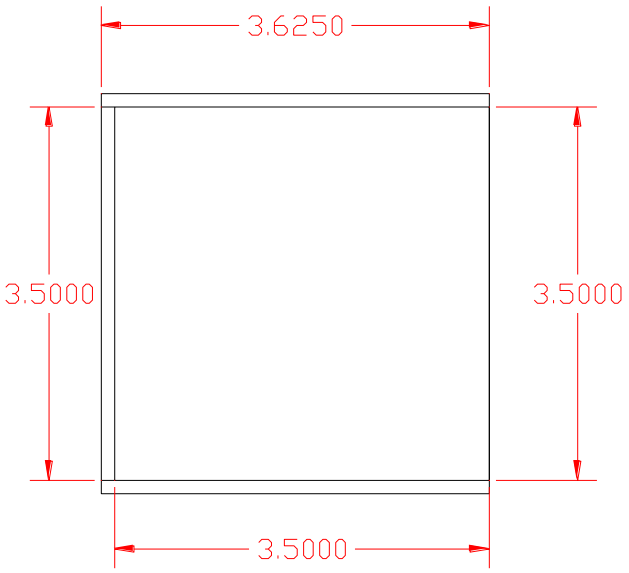
Block will be slightly higher because of the Velcro attaching it.



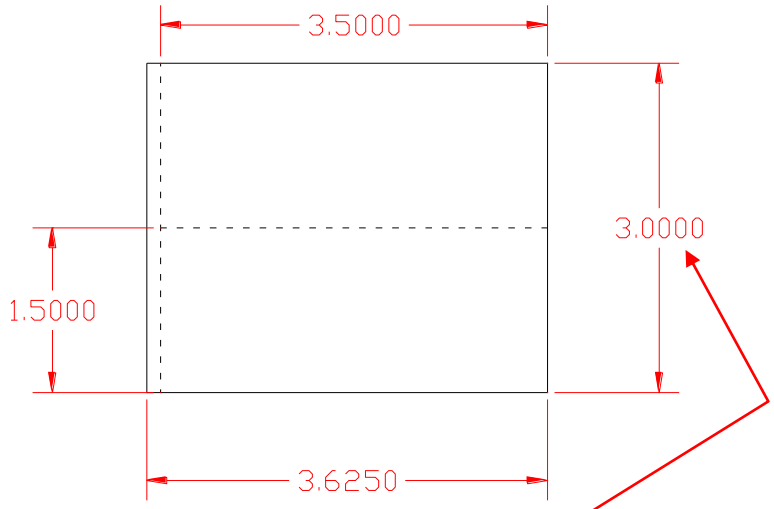
Drop Off Blocks

Mail Route Delivery

Top View



Side View



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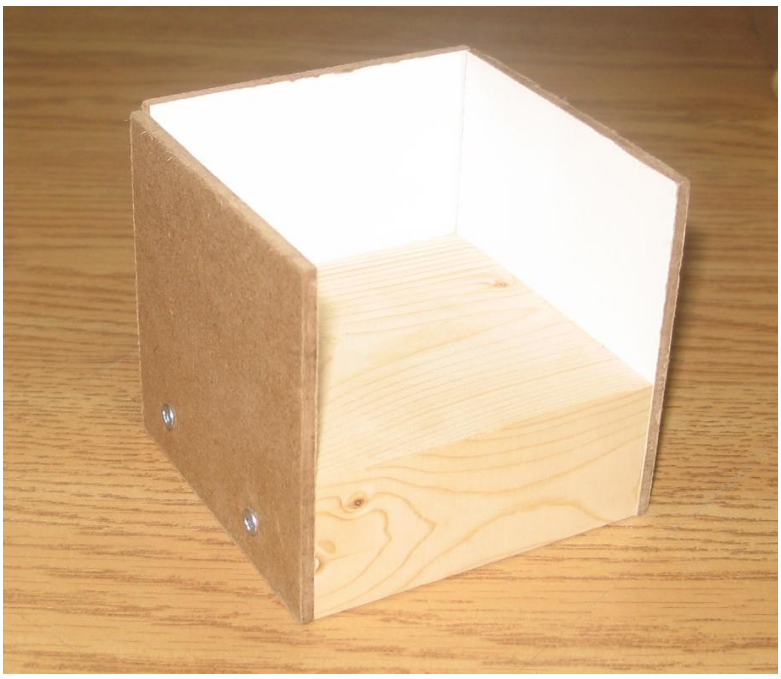

5th Annual Dufferin-Peel/Peel Regional Robotics Competition
Friday, May 27, 2011

Application Deadline: Thursday, May 12, 2011

Fax to: Paul Lewis, St. Francis Xavier S.S. 905-568-1026

☺PLEASE PRINT NEATLY☺

School:	**Coach:**
School Board: □ **Peel** □ **Dufferin Peel**	**Coach's email:**

Team 1

Robot's Name:_____

Name(1):_____ **Dietary Requests:**_____

Name(1):_____ **Dietary Requests:**_____

Team 2

Robot's Name:_____

Name(1):_____ **Dietary Requests:**_____

Name(1):_____ **Dietary Requests:**_____

Alternate Team
(ENTRANCE DETERMINED BY DRAW)

Robot's Name:_____

Name(1):_____ **Dietary Requests:**_____

Name(1):_____ **Dietary Requests:**_____

Observers
(MAX OF TWO)

Name(1):_____ **Dietary Requests:**_____

Name(1):_____ **Dietary Requests:**_____

Comments:

Consent/Waiver

Date: Monday, May 2, 2011

Dear Parent/Guardian and Student

Your son or daughter will be involved in an exciting event taking place at John Fraser S.S., and we would like to capture this exciting event on camera.

We require student and parent permission to use a person's photograph, voice, work and/or name for media videos to promote the competition.

The following event will be held on __May 27, 2011__:

Peel Board/Dufferin-Peel Board Regional Robotics Competitions at John Fraser S.S.

Please review the consent form below and, if satisfactory, please complete and Return it to the robotics coach/teacher at your school before May 20th.

Authorization & Release

I hereby consent to the activity/event, as described above. I understand that photographs, films, written work, video or audio recordings, may be used, edited and released to newspapers, radio, television and internet providers and may be used by newspapers, and on the radio, television and internet.

I hereby release the Peel District School Board and Dufferin-Peel Catholic District School Board and its employees and assignees from all claims resulting from the use, editing and release of any photographs, films, written work, videos or audio recordings with respect to this event/activity. This consent shall be continuing with no limitations or reservations, except those stated above.

Date: _____

Student Name: _____

(If student is 18 years of age or older)
I am at least 18 years of age, and I consent to this authorization and release.

Signature: _____

Address: _____

I am the parent or guardian of _____and I consent to this authorization and release.

Parent/Guardian signature: _____