Team Member Profile

Edwin Smith:

My name is Edwin Smith. this is my first time participating in the Robotics club. I am from the International School in Bellevue, WA. My positions on the team include notetaker, mechanic, and photographer. I am 13 years old and in 8th grade. On of my favourite sports is badmitton, and I really like table tennis. I was born in Brisborne, Queensland, Austrailia and moved to America just before I turned two. I have been to many schools in the past, but one of my favourites is International. It has been a real bonding experience, and I have made many friends. This has been a learning experience for me and has opened up a knowledge of engineering. This will help me in my future carreer of Architect.

Amelia Mcdermott:

I had a lot of fun because this team has oneof my friends, Julia, on it, meaning that it was not an all guys team. I learned a bunch about friction and feel lucky to be a part of this team!

Julia Pyke:

I am in 7th grade at the International School of Bellevue. During the FTC season, I helped out a little with programming and creating the team's engineering notebook. From this experience, I learned that even though it seems like there is a lot of time to create a robot, there reially isn't. This did not really effect what I would want to do for a career, but it was still a cool experience.

Anthony Kao:

I am currently a nineth grader at the International School of Bellevue. This is my first year doing FTC, and I will be one of the drivers at the competition. I am more of a sports person, especially when it comes to playing tennis, but I thought it would be a fun and great learning experience if I joined this club. Playing tennis is more of an individualistic sport, and the trophies you win are because of your hard work. FTC, however, is about teamwork and the awards you win are because of the group's success. I am hoping that this year will be a great year!

Andrew Nelson:

About a week ago, one of the girls on my FTC team made clay penguin necklaces for everyone on our team. Everyone knows that Penguins are black with a white belly but mine was white with a black belly. The girl who made my penguin said I was just that special. I must say, throughout my life I've been known as the sour potato. Ever since the first time I saw Yu-Gi-Oh and saw Kaiba in his basement talking to his super-computer, I wanted to work for Microsoft. Since then I've learned C++, HTML/PHP/Javascript, C#, basic, bash, python, and am fairly experienced with a lot of the popular linux apps like apache2 and ssh. My experience for software engineering centers around web development. I've spent the most time out of any language in PHP. Because of this, I have been the main team programmer for this year's competition.

Christian Gebhart:

Kenneth Kao:

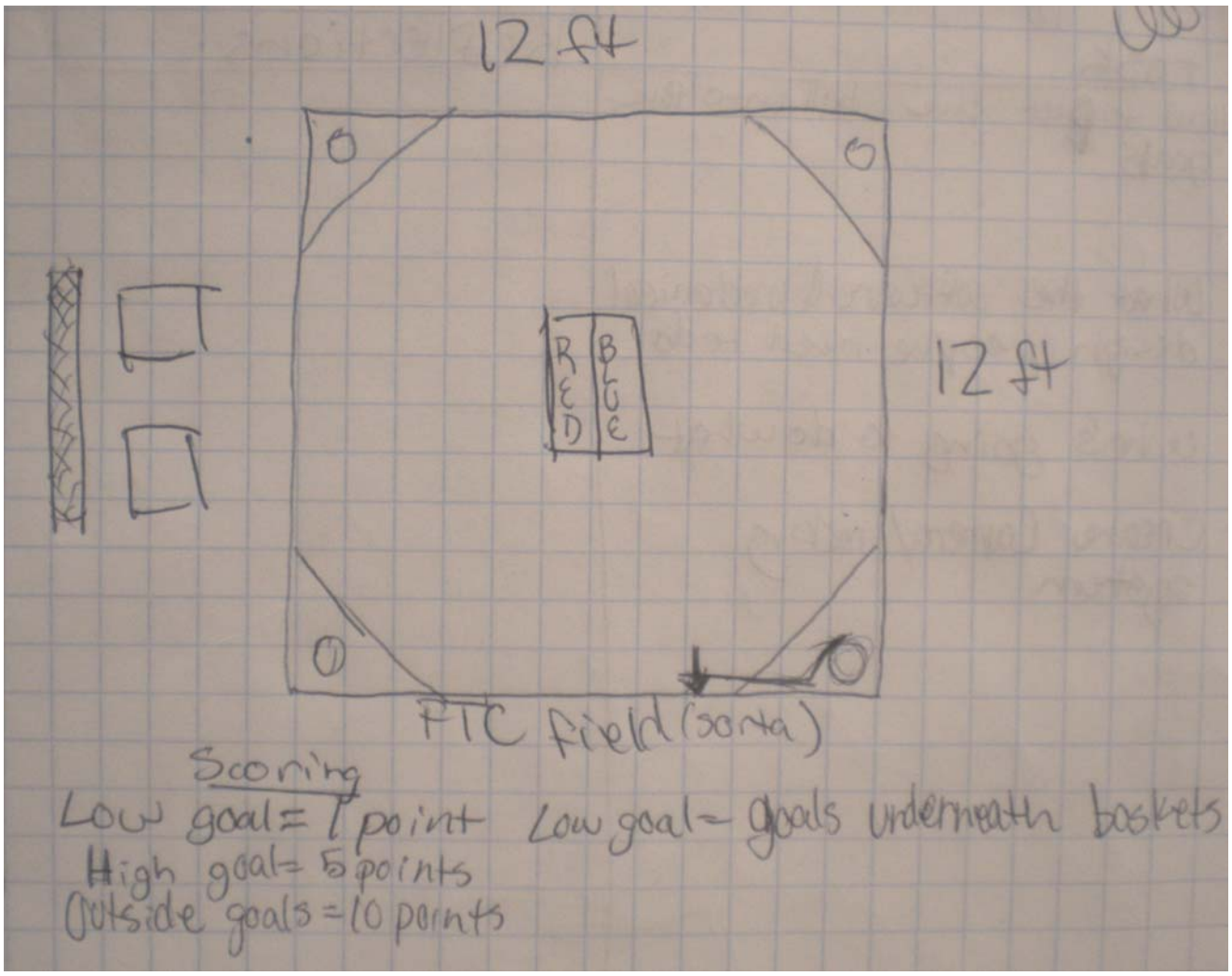
William Nathman:
William is 13 years old and a 7th grader in his first year of FTC. Last year he competed in the FLL program and this year has locked in stone the idea that started then. Most of the year is spent thinking of good ideas, but closer examination of the rules shows that many are not allowed. Also, after digging through the parts a few times, most of the remaining ideas are discarded. Much of his time this season has been spent making models of the few that remain, but most are then discarded after testing begins. By the end of the season, the team is still outmatched by the more veteran teams who are more familiar with the kit of parts. It is important to start early on the robot to build experience with designs, and for this reason William will be a part of the FTC program next year.

Kevin Lee:

Brian Tsang:
This is my first year participating in the FTC program. I am 14 years old and took part in the construction, t-shirt design, and propaganda. I am in the 8th grade, but am currently taking 10th grade math and 9th grade science. My interests include construction, programming, and artwork. I designed the t-shirts.

17 September, 2009

These are my notes on the field from our strategy discussion. This is really important to know because when you write a program for the robot, you need to know the features of the field and the distances. The triangles on each corner are the ball deposite ramps with the ball holders on top. The Box labled “BLUE” and “RED” in the center of the field are the low goals. The two boxes outside of the field are the outside goals with a mesh net placed behind them so that the balls can be contained. The high goals are not depicted in this drawing.



Julia Pyke, Sept 2009: _____

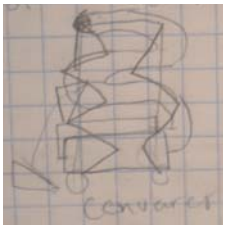
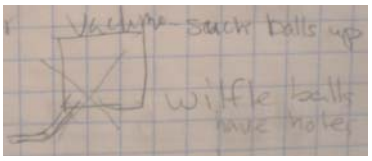
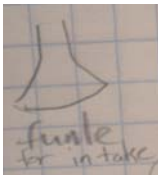
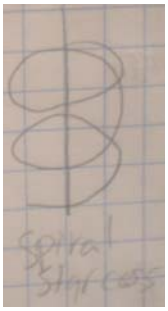
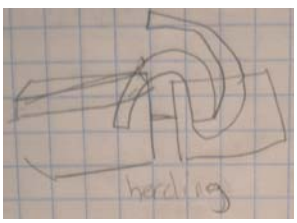
September 19, 2009: 5:00-8:00pm

First Team Meeting After Kick-Off

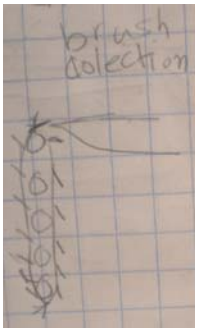
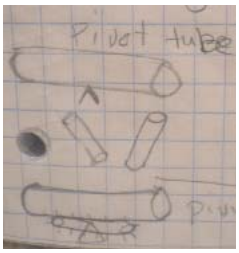
Need To:
-Pick Up Balls
-Store Balls
-Release/Fire Balls

Should:
-Get Yellow Ball out

We discussed pick-up, score, and shooting mechanisms. Balls are 2.85" in diameter.

Drawings:	**Explanation of Design:**
	-Has to have a certain amount of balls to work -Serpentine Belt carries balls up to the top to be shot off
	-Vaccum can pick balls up off the ground -PROBLEM: Wiffle balls have holes, so the vaccum will suck air from the holes in the ball, not creating a seal.
	-Placed in the front of the robot -Channel the balls into a single path so they can be handled better by the shooter
	-Wheels spin in opposite directions to bring the balls in because spinning them in the same direction would push them out -Place in front to collect balls inward, or could maybe use for uptake
	-Would operate like a circular escalator to spin the balls upward -PROBLEM: Didn't have the matierials to make the system
	-Would use a vaccum system to transfer the balls from one holding tank to another -Would shoot balls back out through an undefined system -PROBLEM: see vaccum system

Amelia McDermott, Sep 19 2009 _____

Drawings:	**Explanation of Design:**
	-Would be a conveyor with some sort of rod sticking out at an angle to pick up balls -Rods sticking out of the belts would carry balls up and drop them into a holding tank above the belt where they could be collected and shot out of the robot -PROBLEM: rods could not be attached to the conveyor and the matierials we had could break easily.
	-Used to collect the ball when slanted -Stored when flat -Shot out from either position -This tube can be positioned at different angles so that the balls can be shot in any direction. This tube will be made of 3” PVC to direct the balls.

Amelia McDermott, Sep 19 2009 _____

September 19, 2009 Amelia, Edwin, William, Brian, Kenneth, Anthony, Timmy, Andre, Julia

Tali operated
- dump balls in low goal & shoot balls in high goal

End game
- collect/dump/shoot balls
- try to pick up yellow ball, in maybe different track to make it come out before other balls
- shoot @ lower goal - high spinning goal is a waste of time
- Picking up balls: scooping up, herding, conveyor belt, blades, arm/grabber to pick up, vacum, baseball shooter-type-thing, rotating brush, lifting mechanism

- ball storge
- ball dump
- ball shooting

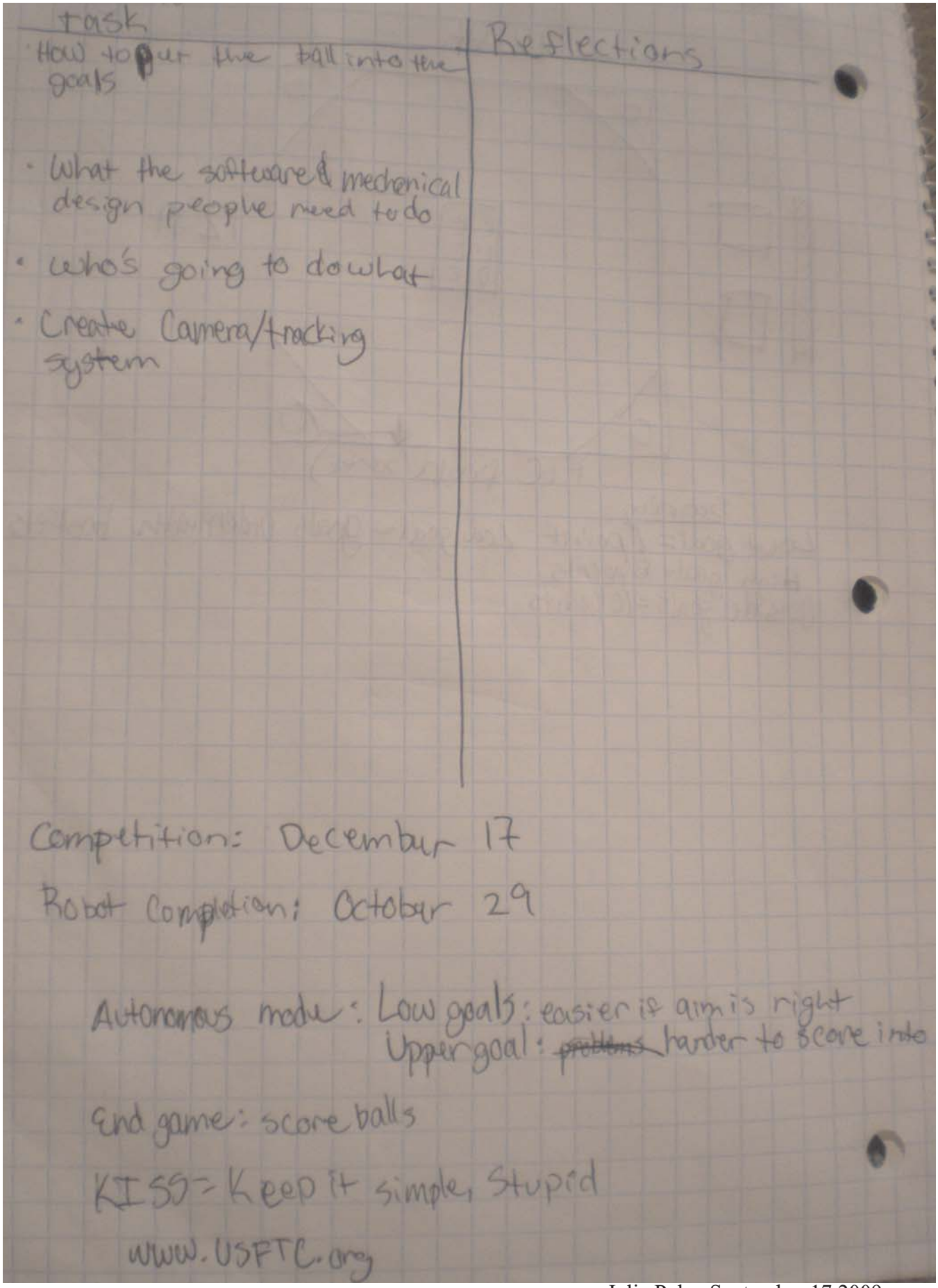
My idea of a robot

Storage
Light sensor 2 recognize yellow ball

~~Dumping balls into lower goal:~~

17 September 2009

Strategy Notes from a group discussion.



Task

How to put the ball into the goals

- What the software & mechanical design people need to do
- Who's going to do what
- Create Camera/tracking system

Reflections

Competition: December 17

Robot Completion: October 29

Autonomous mode: Low goals: easier if aim is right
Upper goal: ~~problems~~ harder to score into

End game: score balls

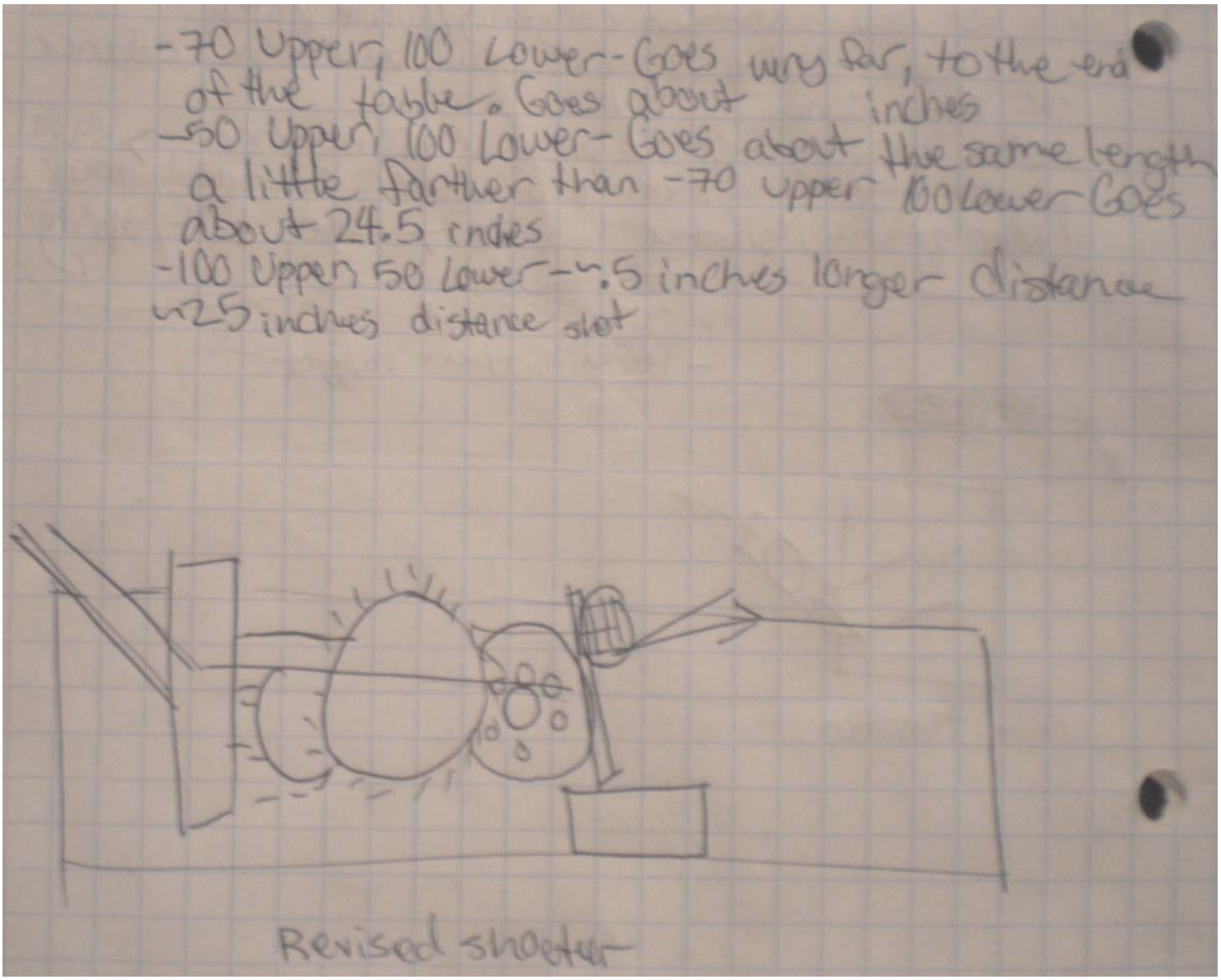
KISS = Keep it simple, Stupid

www.USFTC.org

Julia Pyke, September 17 2009: _____

October 8, 2009: General Meeting 5:00-7:00pm

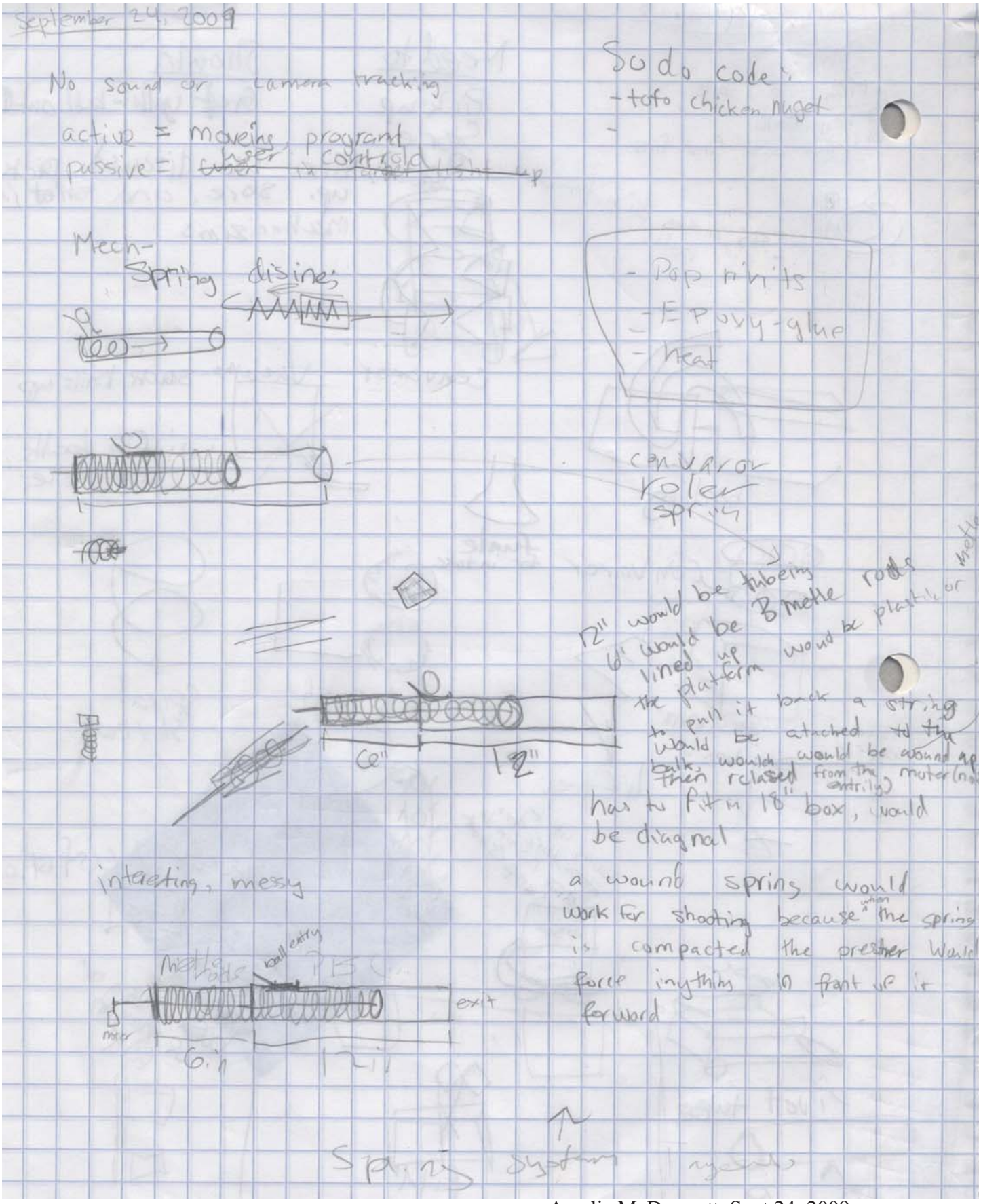
This is a drawing and notes on the shooting system that we are currently using on the robot.



Julia Pyke, October 8 2009: _____

24 September 2009

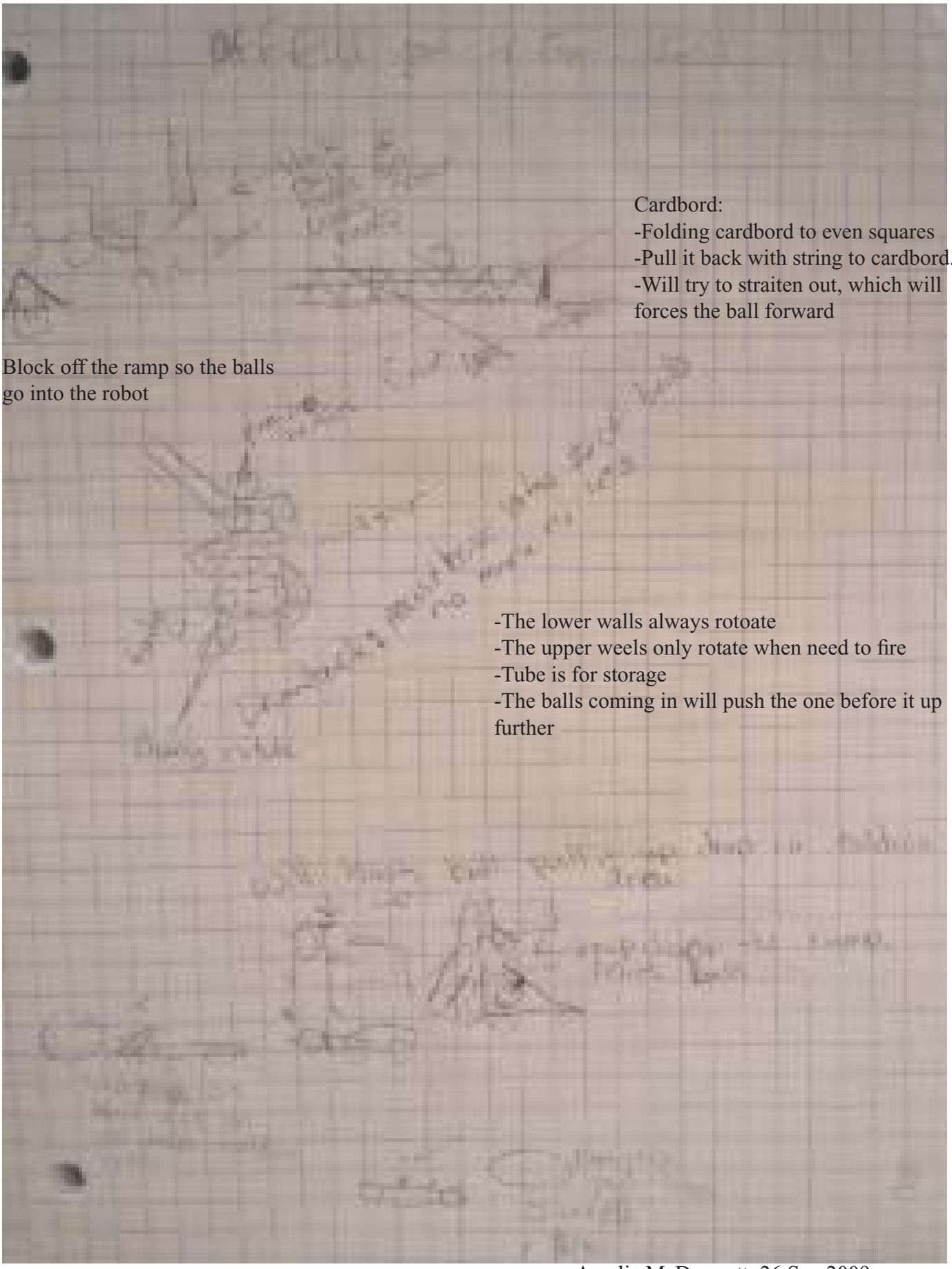
Today we split up into groups and explored different systems of shooting a ball using any materials. I worked with William to build a spring-gun mechanism. Unfortunately, we later realized that this design would not work because we were not given a spring and the re-loading mechanism would be too complicated.



Amelia McDermott, Sept 24, 2009_____

26 September 2009:

These are notes on my conceptual designs for shooting mechanisms from my prototyping.



Cardbord:
-Folding cardbord to even squares
-Pull it back with string to cardbord.
-Will try to straiten out, which will forces the ball forward

Block off the ramp so the balls go into the robot

-The lower walls always rotoate
-The upper weels only rotate when need to fire
-Tube is for storage
-The balls coming in will push the one before it up further

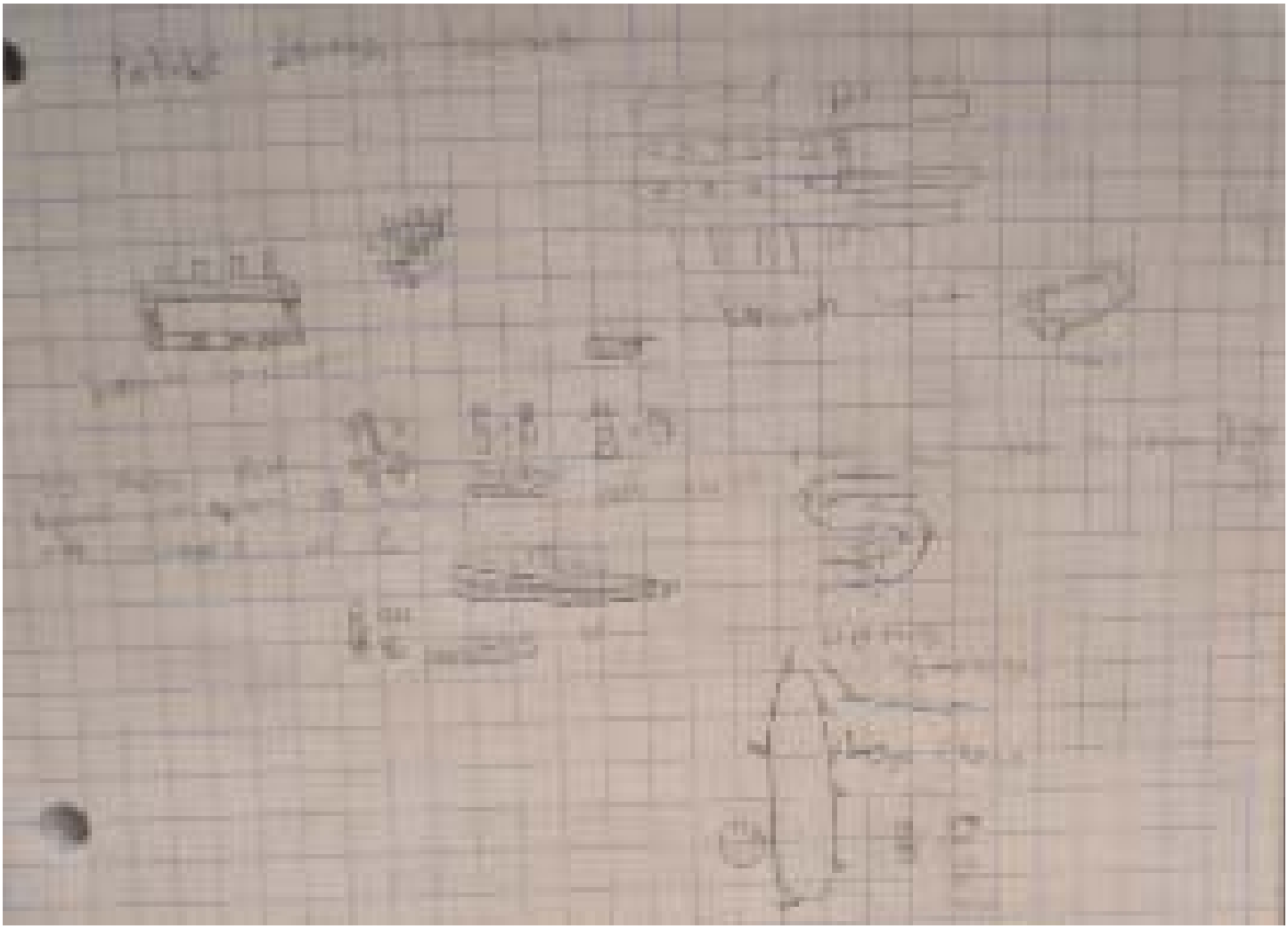
Amelia McDermott, 26 Sep 2009:_____

Oct 3, 2009

Notes on how to build a roller and uptake system.

William and I built a roller system to bring balls into the robot so they can be channeled and shot out of the shooter. The roller is made of Legos and has spikes along the sides to grab the holes in the balls. We need to actually run the roller and decide which one to use

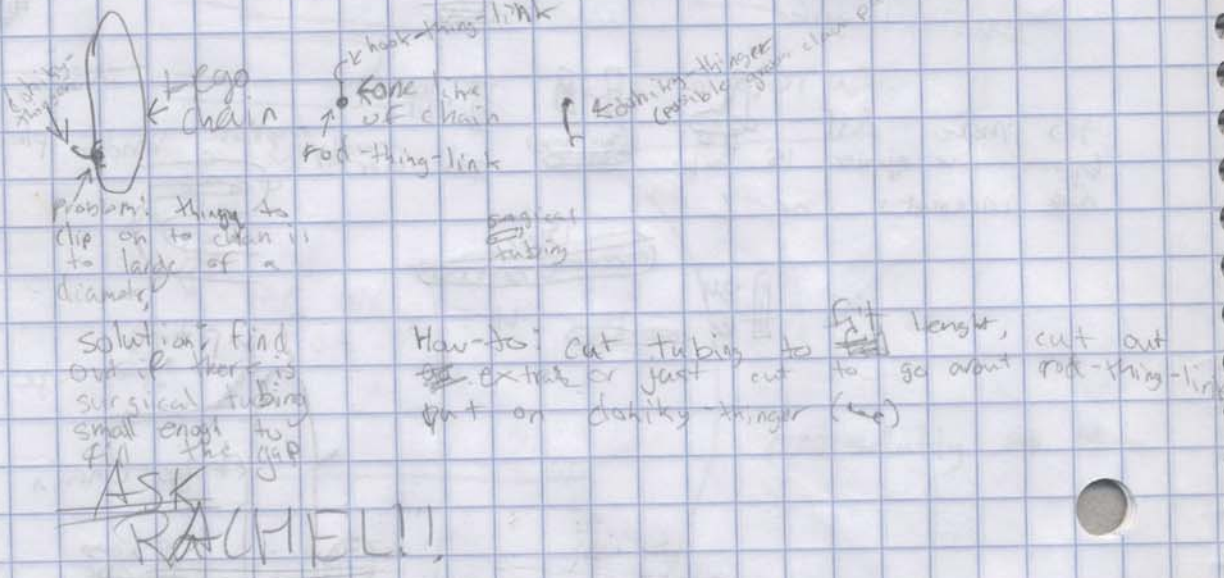
I am also playing the idea of using Lego chain to create the uptake system. This system is identical to the one I explored earlier which would have lego spikes positioned at an angle so that we could grab the balls and pull them up to the shooter. Unfortunately, there is not enough chain in our kit to do this, and we are not sure if we are allowed to use Lego chain. Also, none of the lego pieces would fit into the small spaces in between the chain links.



Amelia McDermott 3 Oct 2009:_____

Oct. 15 2009

Random: kidnap distraught created "lego" child, somhow shrink them to 18" by 18", and make them do what we tell them Not. :)



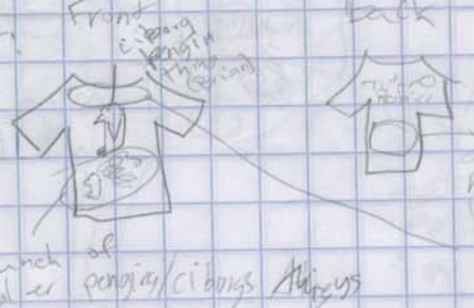
Solution: find out if there is surgical tubing small enough to fit the gap

How-to: cut tubing to fit length, cut out extra or just cut to go about rod-thing-link put on dobby-thinger

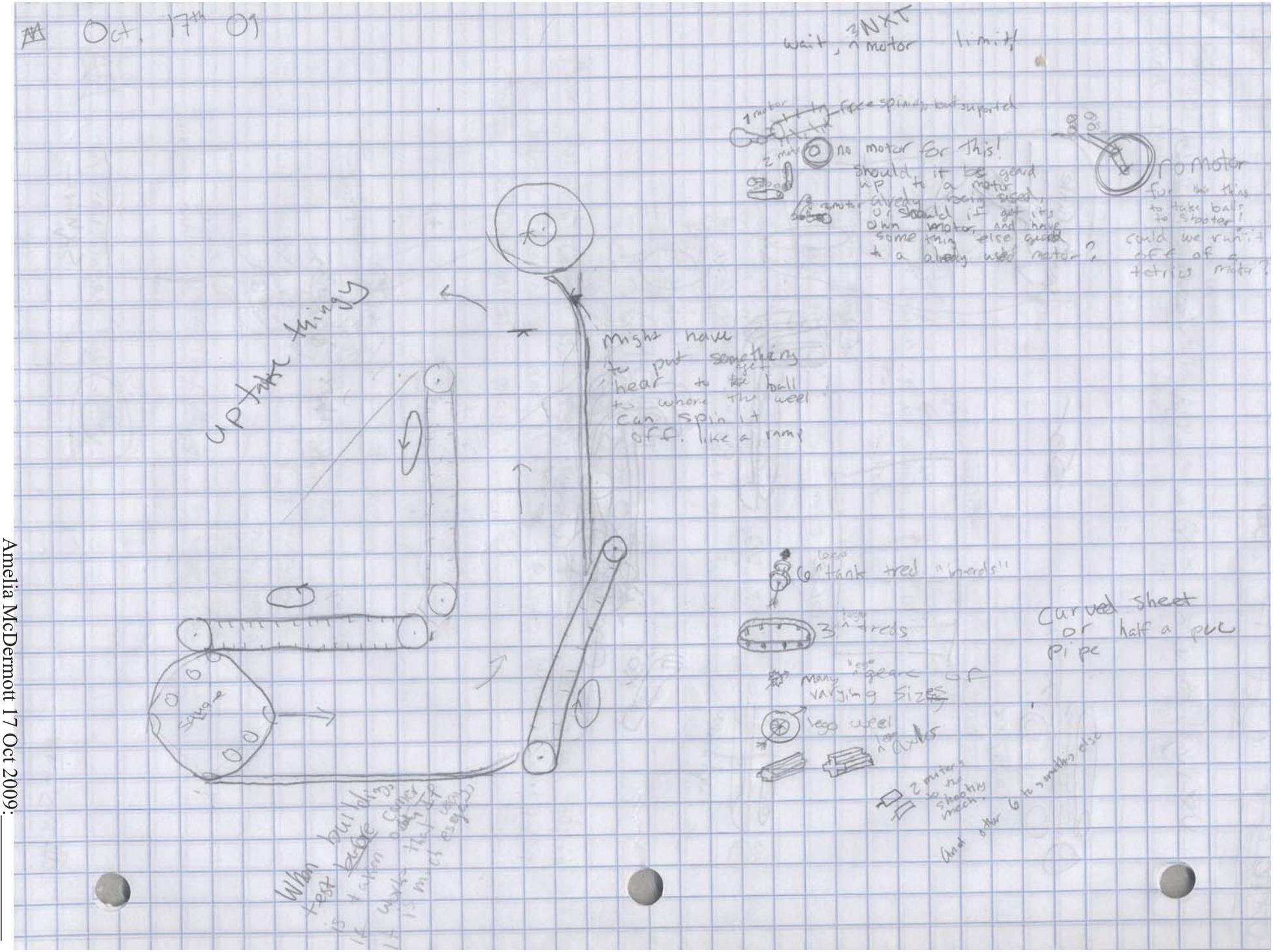
ASK RACHEL!!

More Random: Put lego ipod speaker and hide ipod in legos / take apart and hide in wires. Wala- instant annoying noise that will confuse propel.

T-shirt:



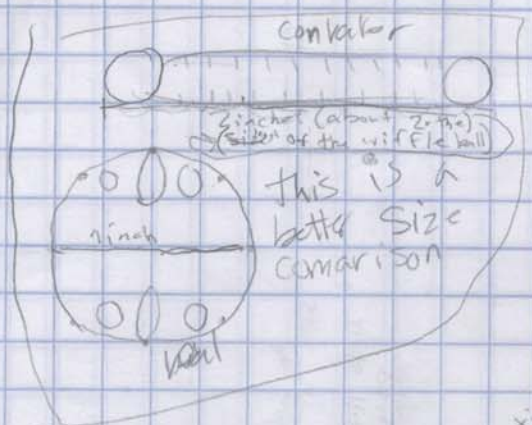
on a sugar high



Amelia McDermott 17 Oct 2009:

Oct. 17th, 09

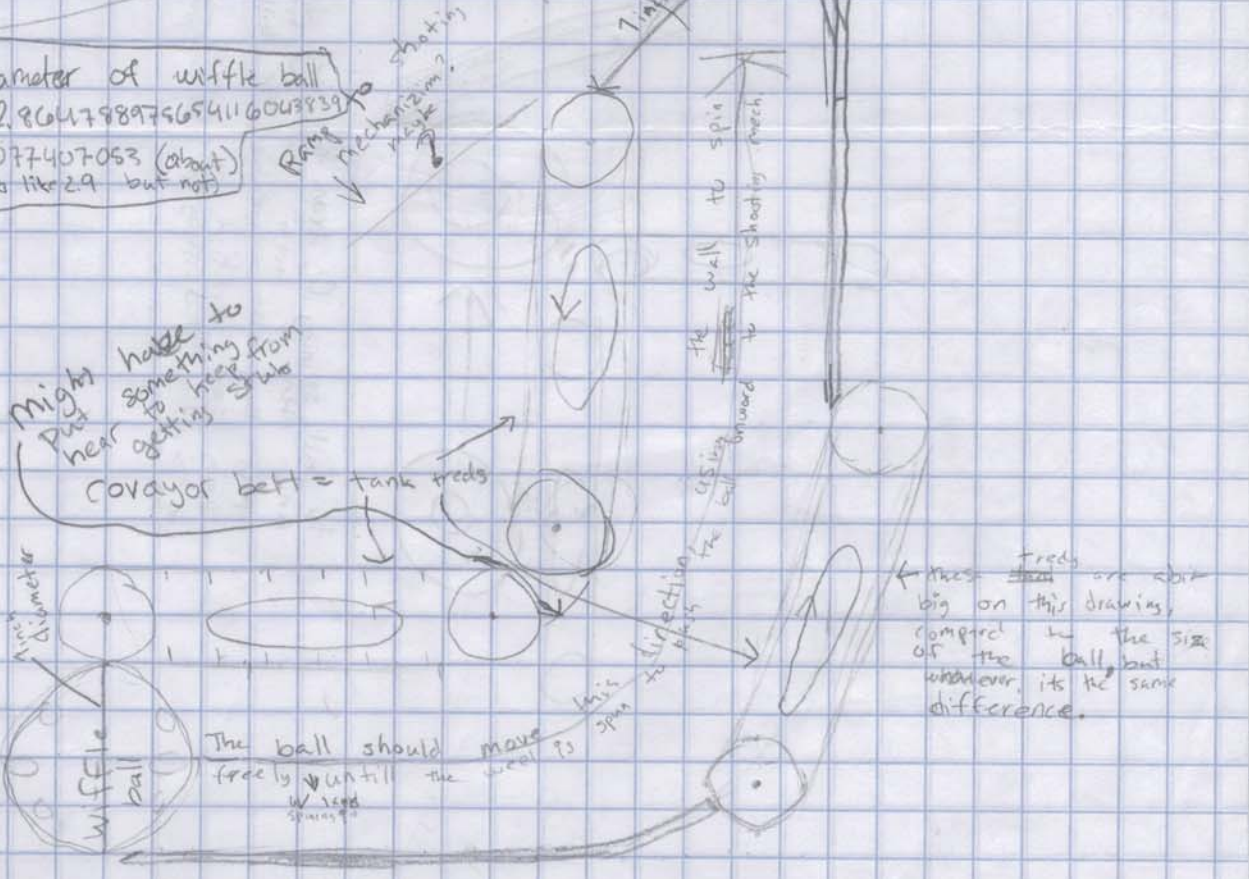
The total ~~length~~ area or ~~pvc pipe/sheet-thing~~ cannot be longer than 24" and if it is a sheet, can't have an area larger than



mech. = mechanism

diameter of wiffle ball
= 2.864788975654116043839
9077407053 (about)
(so like 2.9 but not)

Range shooting mechanism might change



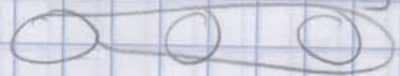
After going through the intake (brush thing) and coming to the up-shooting mechanism it will go or not / probably not.

Amelia McDermott 17 Oct 2009:_____

Nov 5, 2009

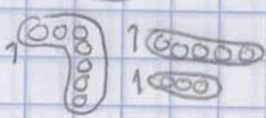
2 blets total
6 rollers total

3 rollers per belt



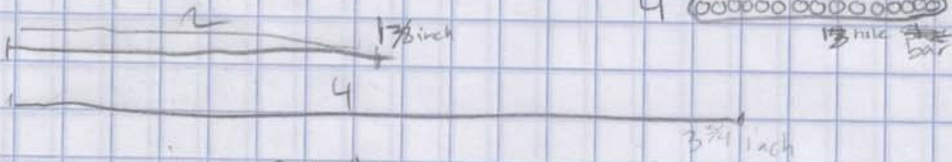
longer axils

11 gears
4 gears
7 round to "x" dohiky
"x" = thinge



1
1
1

III a bunch of thick spacers
a bunch of small spacers
4 — 13 hole bar



draw it out
righ out discution
- fictio
- ✓ poly car vs cardbort
- strigh vs. curved

15
- 4

11
- 9

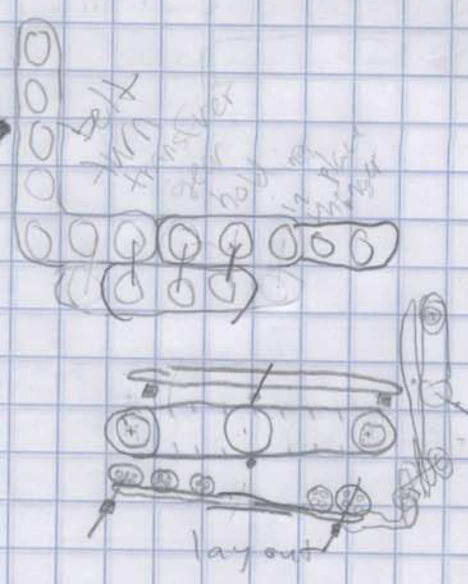
2

or more here

Cardbord vs Poly carbonate

Poly carbonate has less friction which could be good or bad. With more friction, the ball will not slide down the upword slide, but with more friction, the ball may not move up the tube as esaly. The cardbord has more fritition, but is esyer to test a mokup, and isn't alowed in comatition, as is masking tape.

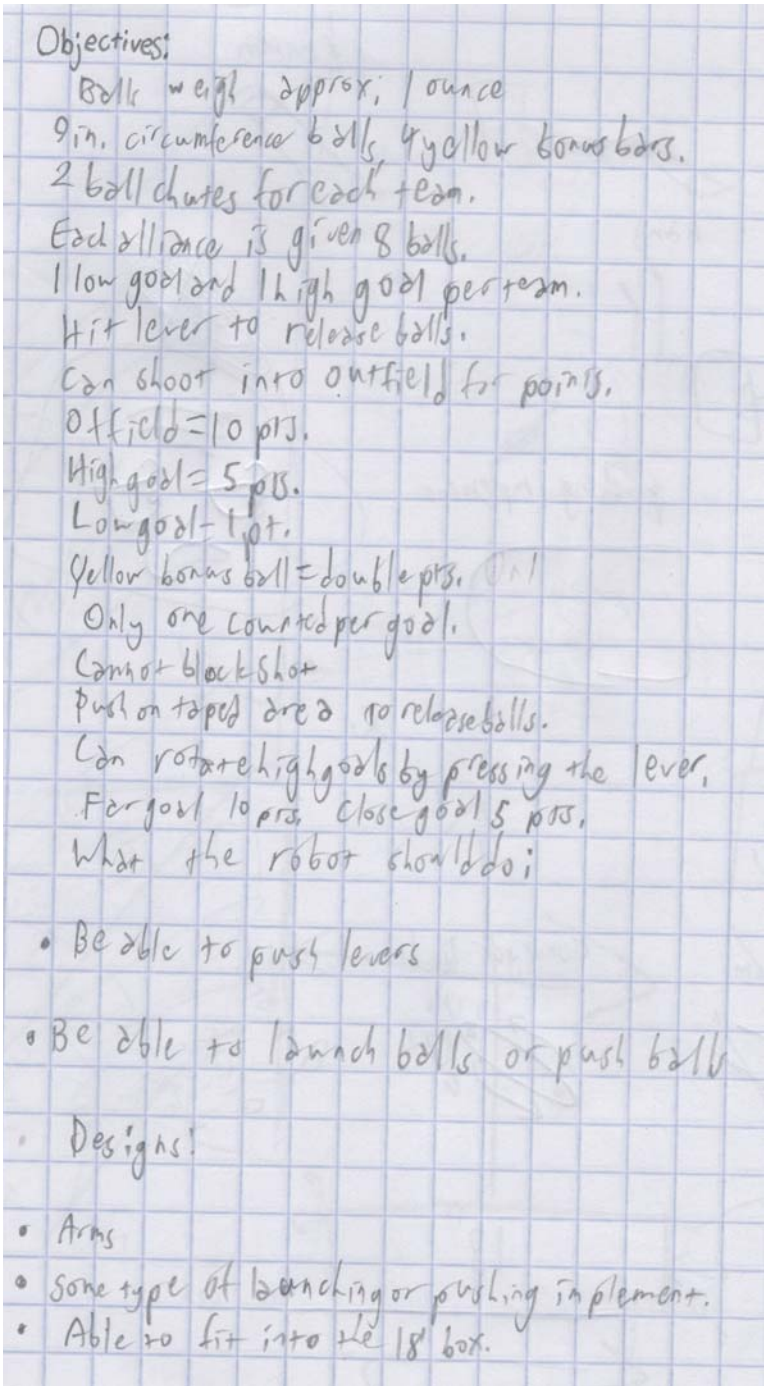
The point turn looks somthing like this



Amelia McDermott 7 Nov 2009:_______

12 September 2009

These are my notes on the challenge while watching the Kick-Off video about scoring, rules, and potential directions to take our robot's design.



Objectives:

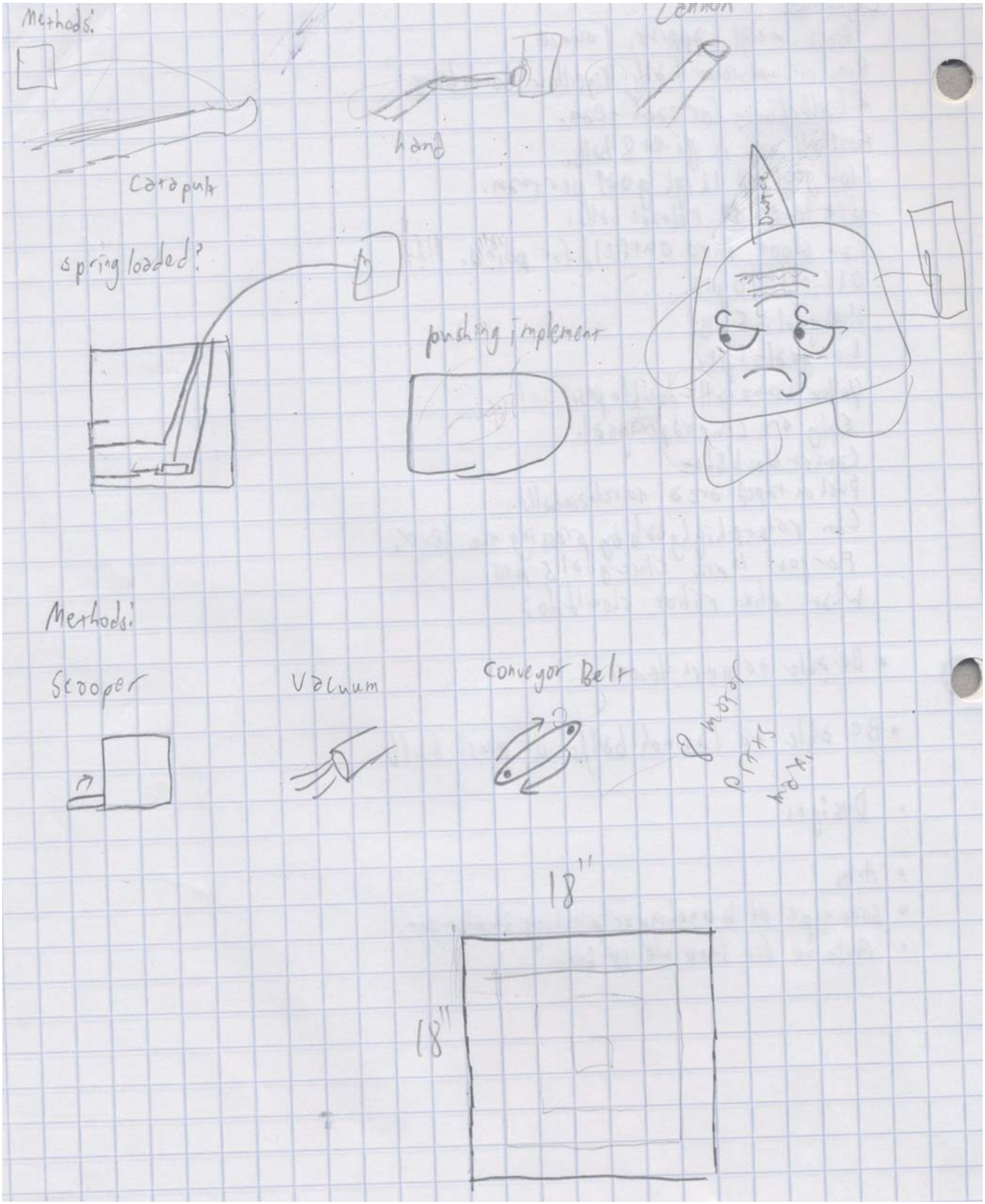
Ball weigh approx. 1 ounce
9 in. circumference balls, 4 yellow bonus balls.
2 ball chutes for each team.
Each alliance is given 8 balls.
1 low goal and 1 high goal per team.
Hit lever to release balls.
Can shoot into outfield for points.
Offield = 10 pts.
High goal = 5 pts.
Low goal = 1 pt.
Yellow bonus ball = double pts.
Only one counted per goal.
Cannot block shot
Push on taped area to release balls.
Can rotate high goals by pressing the lever.
Far goal 10 pts, close goal 5 pts.
What the robot should do:

- Be able to push levers
- Be able to launch balls or push balls
- Designs:
- Arms
- Some type of launching or pushing implement.
- Able to fit into the 18" box.

Brian Tsang Sept 12 2009: _____

12 September 2009

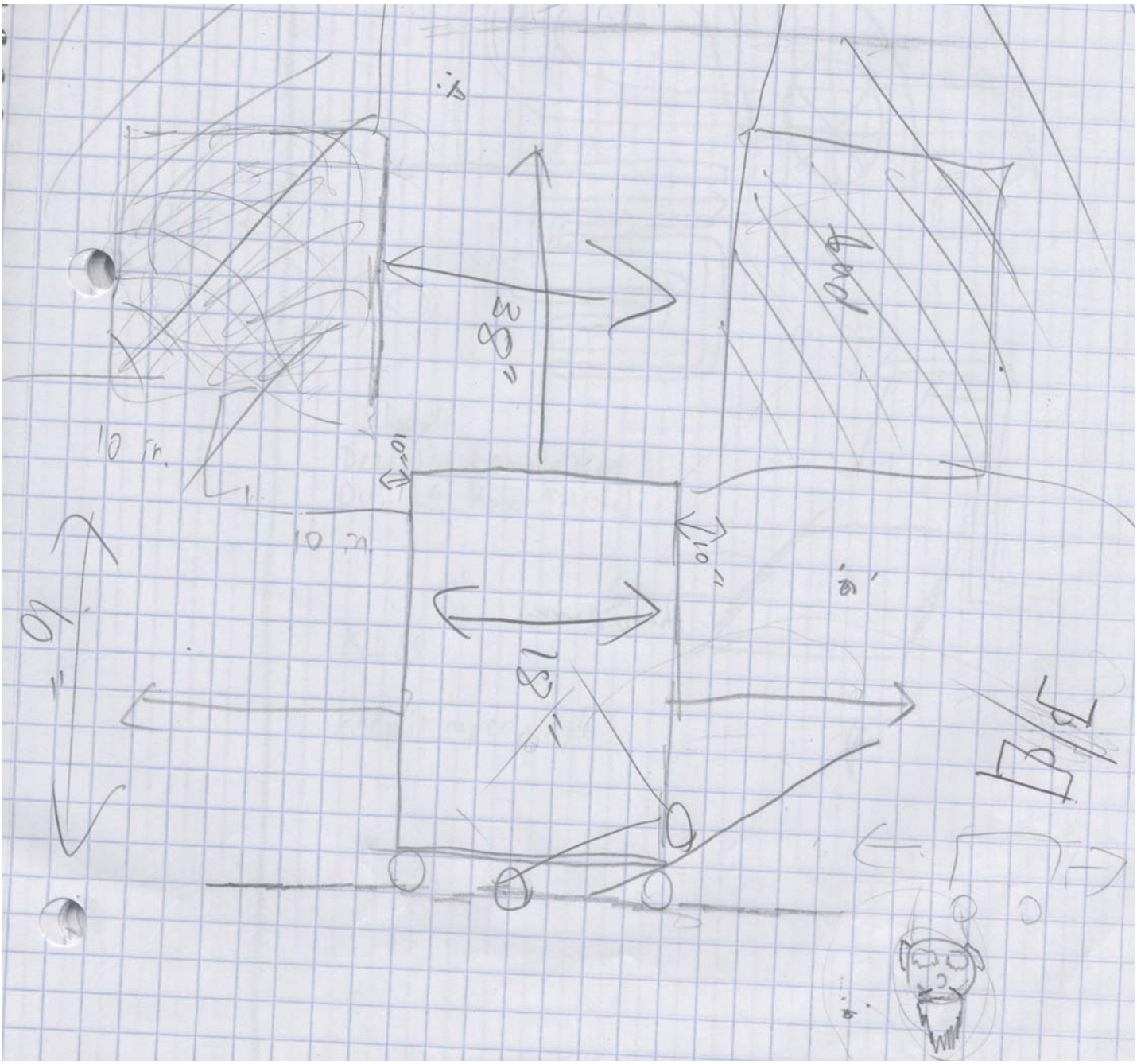
These are my notes from Kick-Off while watching the video. All of these strategies were used in the video, and could be used on our robot this year. Potential firing mechanisms as drawn below include catapults, arms, cannons, and pushing methods. Gathering methods include a scooper, vaccum's, and conveyor belts. Our robot will need to fit within an eighteen inch cube at the begining of the match.



Brian Tsang 12 Sept 2009: _____

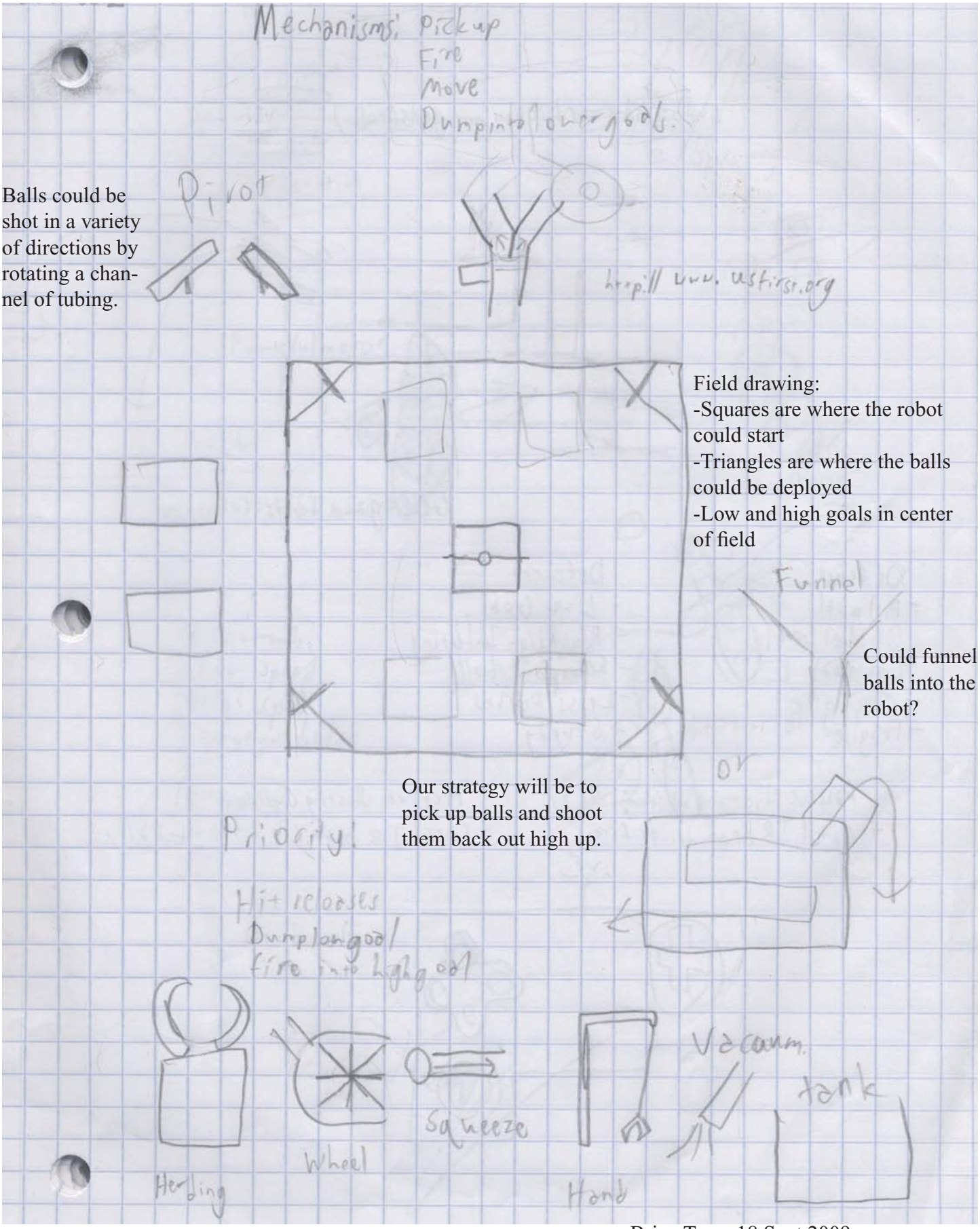
12 September 2009

The robot is required to start in an eighteen inch cube before the match starts, but after that it can expand directly vertically and horizontally as long as no appendages can reach over the wall (side extentions need to be less than ten inches tall).



18 September 2009

These are my general notes on mechanisms that we could possibly use for each of the categories listed.



Balls could be shot in a variety of directions by rotating a channel of tubing.

Field drawing:
-Squares are where the robot could start
-Triangles are where the balls could be deployed
-Low and high goals in center of field

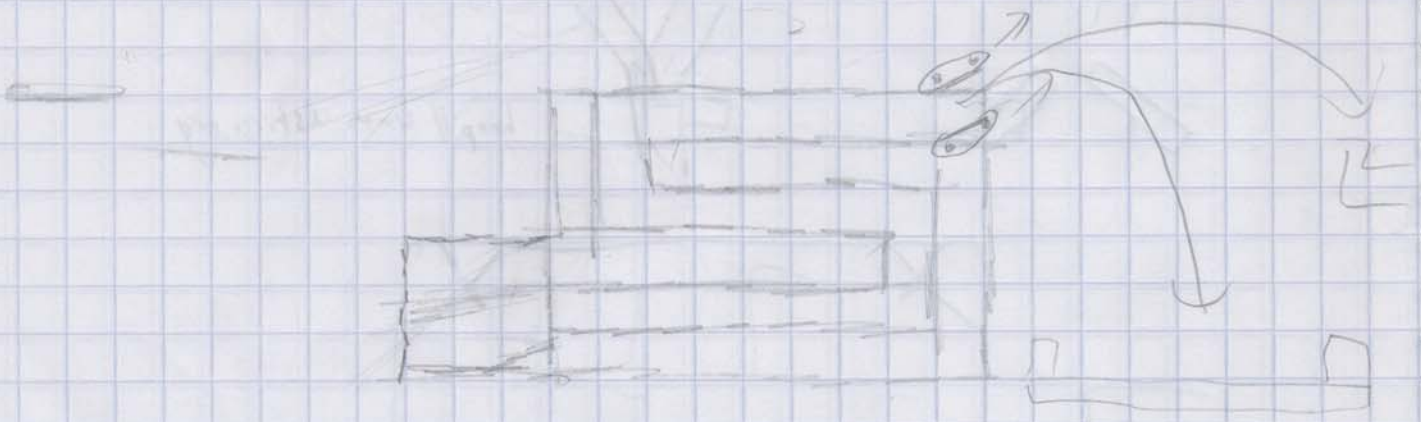
Could funnel balls into the robot?

Our strategy will be to pick up balls and shoot them back out high up.

Brian Tsang18 Sept 2009: _____

24 Sept. 2009

sudo code = chicken nuggets (tofu)



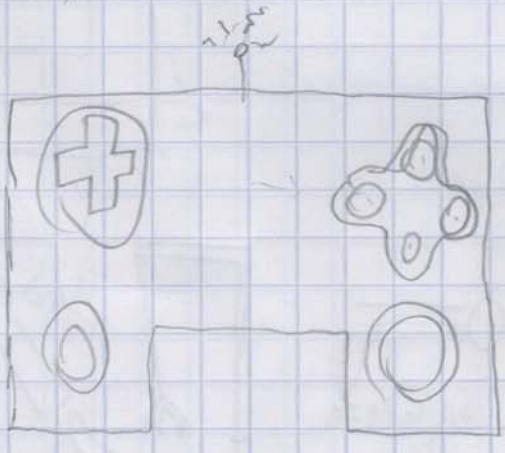
GDC = game design committee

Offense:
- High goal
- Bucket Goal
- Low goal
- More points
- Fragile

Defence:
- Low Goal
- Blocking - Inhibiting
- Scoopout balls
- Less Ports
- Sturdy

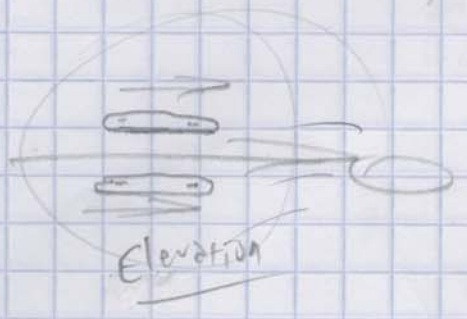
Passive Shooting System:
- Catch IR beam, driver fires

Active Shooting System:
- Catch IR beam, fire automatically



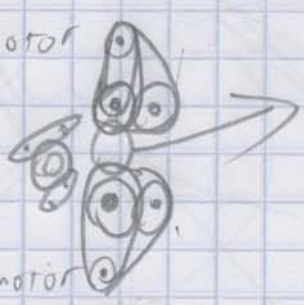
Brian Tsang 24 Sept 2009: _____

diameter ≈ 2.98,

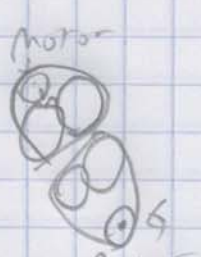


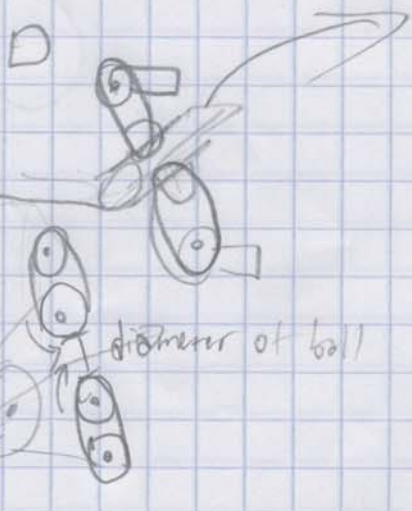
Elevation

Powerful motor



Powerful motor





3 Commands:
Low speed
High speed
Conveyor belt

(extra.)

Brian Tsang

Brian Tsang 24 Sept 2009: _____

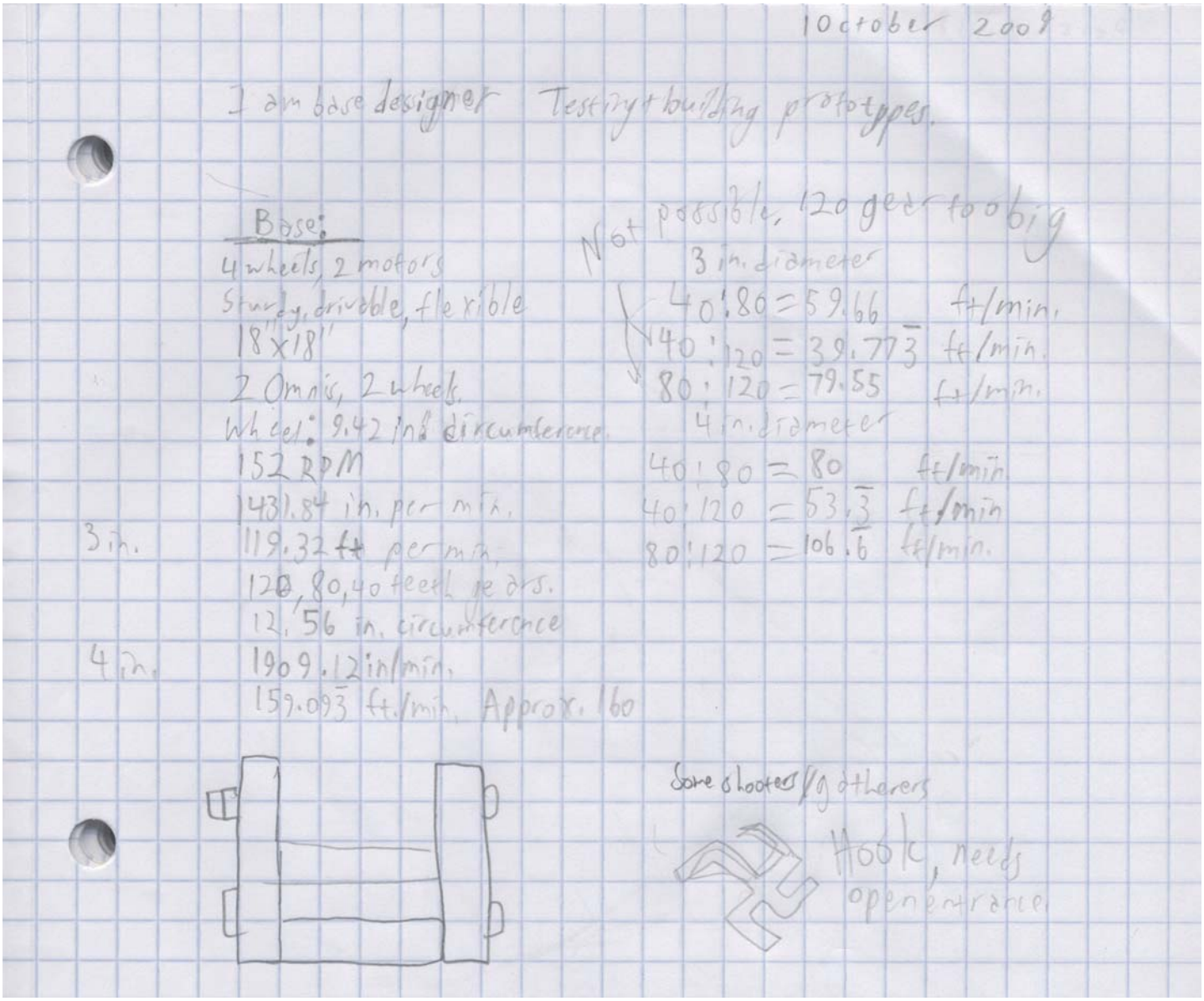
1 October 2009

These are my notes from designing the base. My big challenges are:

-How many wheels and what type of wheels to use? What are their strengths and weaknesses? The rubber wheels are very good for gaining traction but are not that great for manuverablility. Conversely, Mechanum wheels are highly versetile, but do not translate much torque and will therefore be pushed around easily if the robot is hit. We decided that it was more important not to be pushed than to be overly maneuverable.

-What speed to go at? If we go to fast the drivers will not be able to control the robot and we will not have a lot of torque, but if we go too slow we will not be competitive.

-What gear ratio? This depends on what speed we want to go at, but it is good to know what our options are.



Brian Tsang 10 Oct 2009: _____

Who's here?

Amelia ✓
Edwin ✓
Kenneth ✓
Andrew ✓
Christian ✓
William ✓
Anthony
Brian ✓ 3rd
Tim
Julia ✓
Kevin ✓

What happened?
Intake Prototype Finished

Goal:
Test prototype
Channel the balls
Finish shooting, driving, autonomous algorithms

Discussion:
What we should do involving driving the robot?
Strategy?
Autonomous? How do we distinguish colors?

Options?
3 different buttons,
1 large system
3 buttons, human factor
1 system, power drain

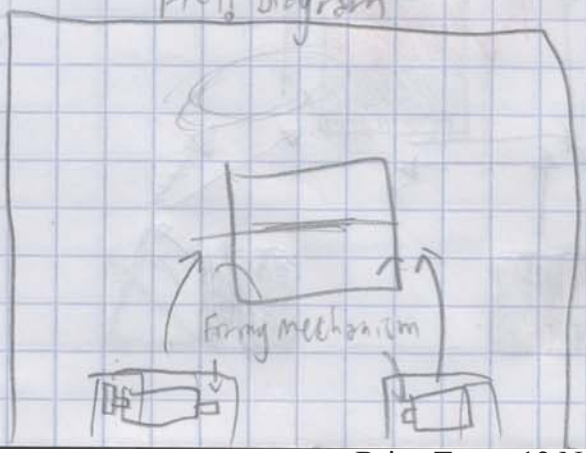
Evil Eye

You wishes work!

Autonomous / Strategy:
Go for low goal,
hit goal posts (Handles)
Code for autonomous? Study code
Don't hit spra bar, -4opts.
Don't hit goal bar (not blackstaped).
Follow Wall touch sensor?
Color sensor?
Ultrasound to find other robots.
Follow White line

Robot:
Speed bump, for funneling balls, last part of bringing balls to shooter?
Shoot fast and slow
Drive, bringing balls?
Start facing closest bar, turn 45° left + right, color sensor, hit is red/blue, go back, turn 45° if other, go 8ft, turn 90°, move forward, hit bar

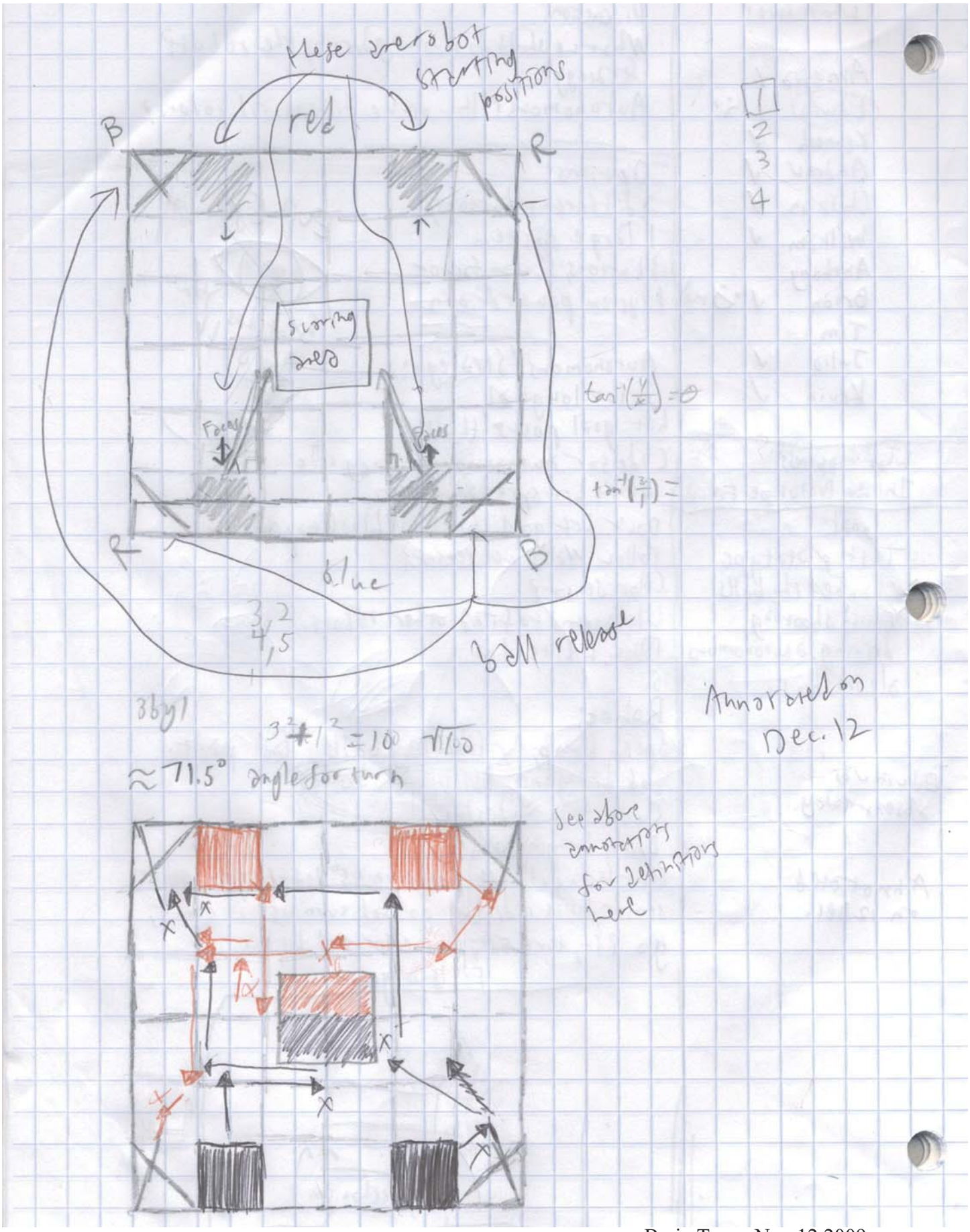
Field Diagram



Brian Tsang 12 Nov 2009: _____

12 November 2009

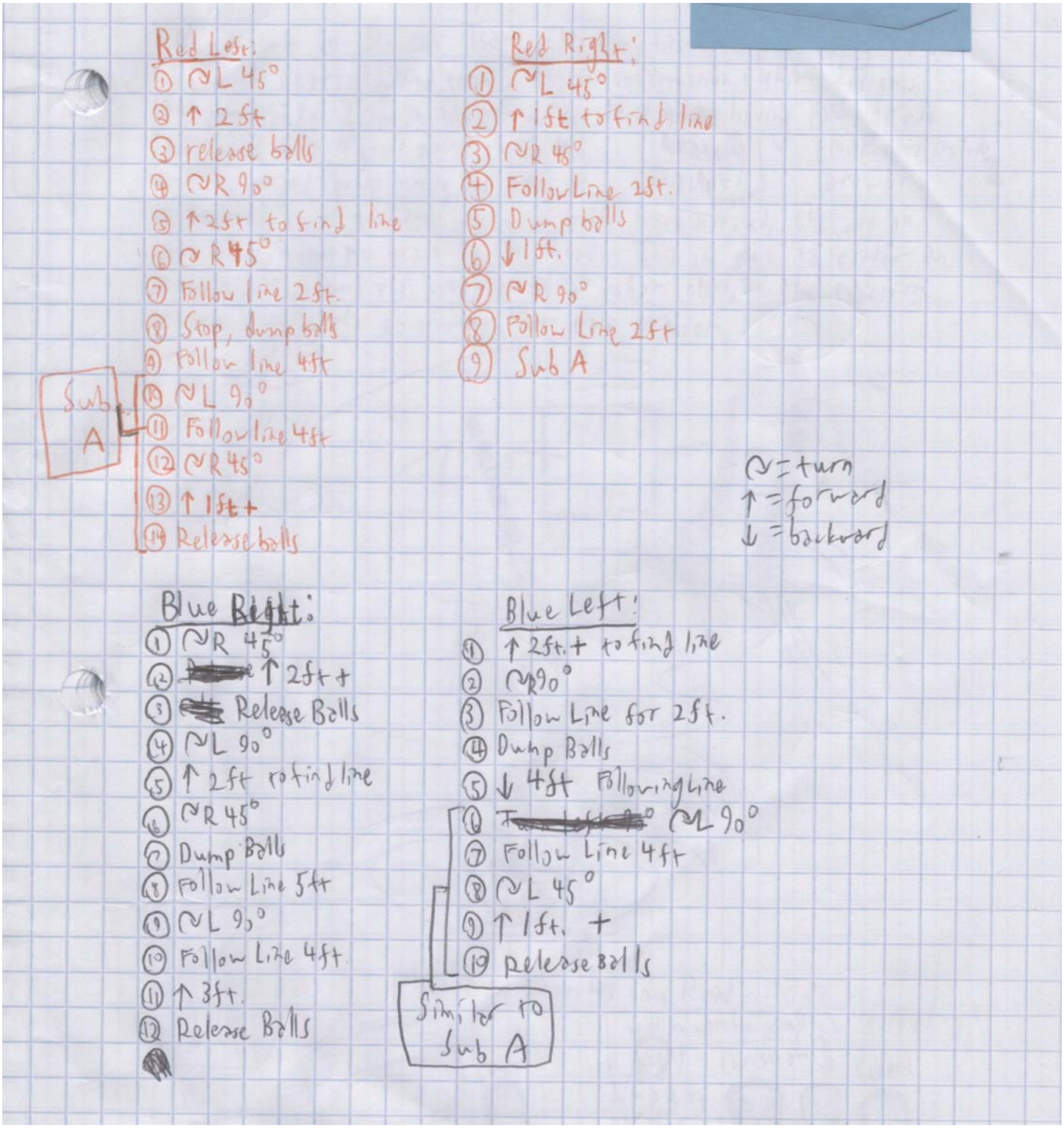
These are my notes on field strategy.



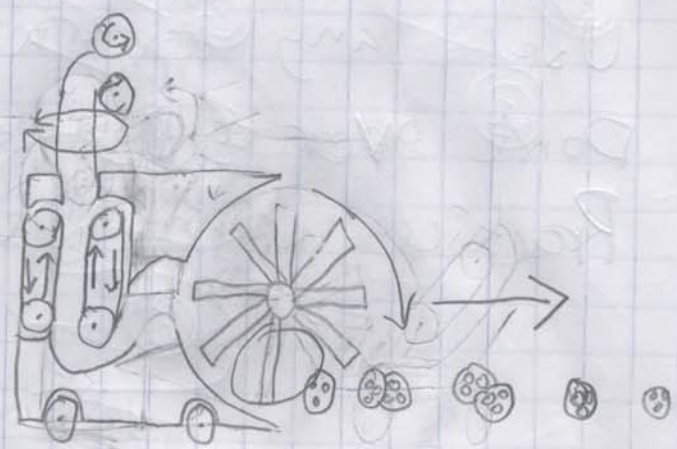
Brain Tsang Nov 12 2009: _____

12 November 2009

More notes on my field strategy from both alliances. These are possible autonomous modes from either alliance side.



Brian Tsang Nov 12 2009: _____



Bring tools, spare parts
Bring a laptop, controller
to competition.
Wear safety glasses
3 drivers, 1 coach
Doesn't have to be same
5-x robot
to passes 3 people each time
No-one Be nice to alliance
three times partner, reach
a decision together
Is top 4 alliance selection
Send out scouts to
help pick alliance
Bribe judges, maybe w/sugar, trinkets

William Nathman 12 Sept 2009: _____

Skill + experience more important than robot ability

Batteries help E.05 G.

Use any extra pares I can

Dont over tighten screws

Practice driving with LEGOs

William Nathman 12 Sept 2009: _____

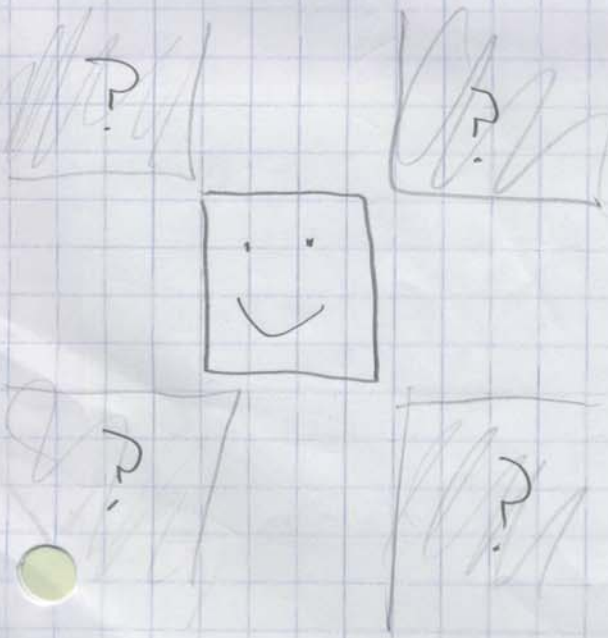
9/17

Task

Reflections

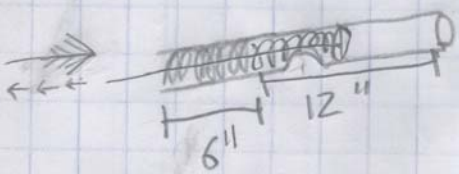
General design
What do we have to do? How will we do it?
competition 12/13
Robot built by 10/29?

Score: 1 low
5 high
10 off-field
Score counted after autonomous @ end of match also
5 pts releasing, near goal
10 pts releasing, far goal



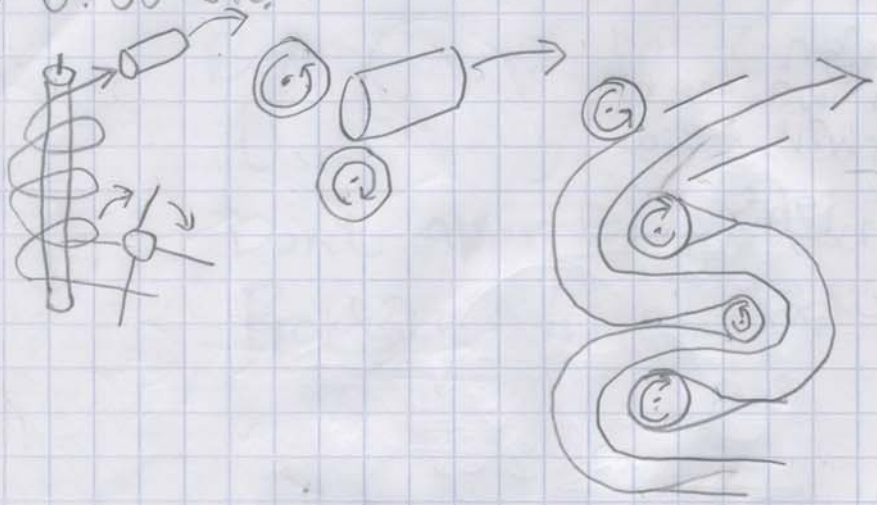
Ball input:
brush
conveyor belt
herding
catapult
air pressure tube

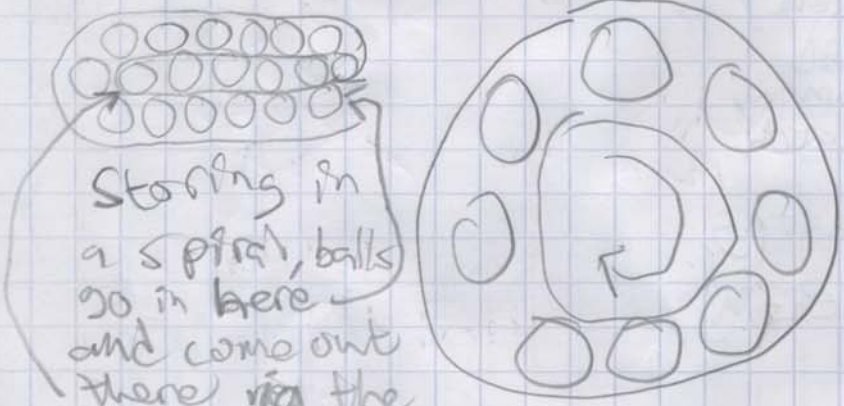
BANNER

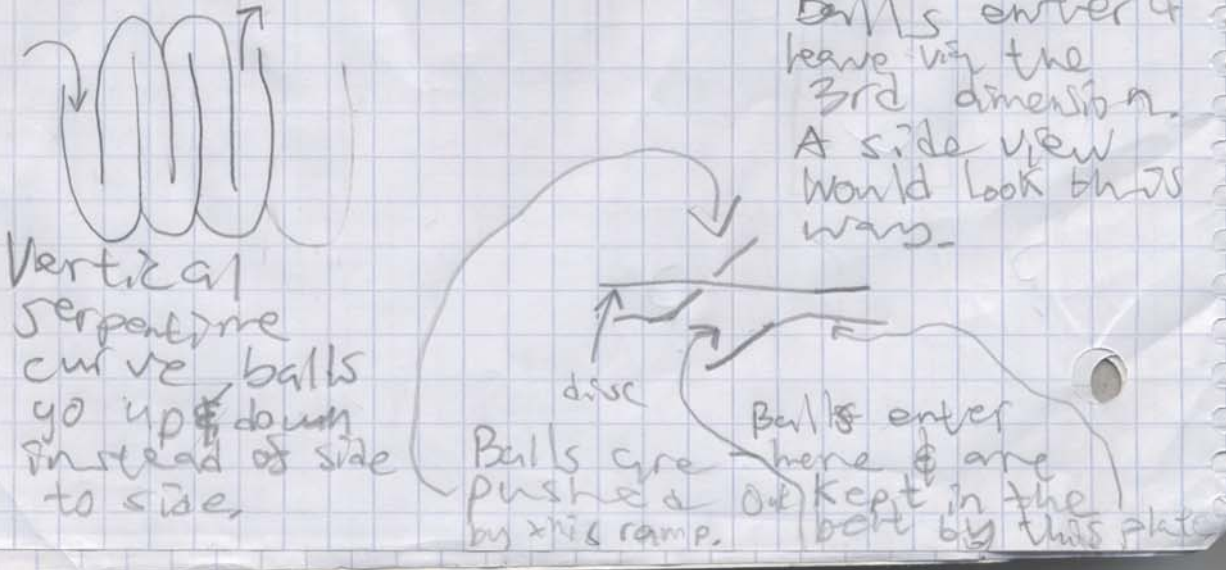


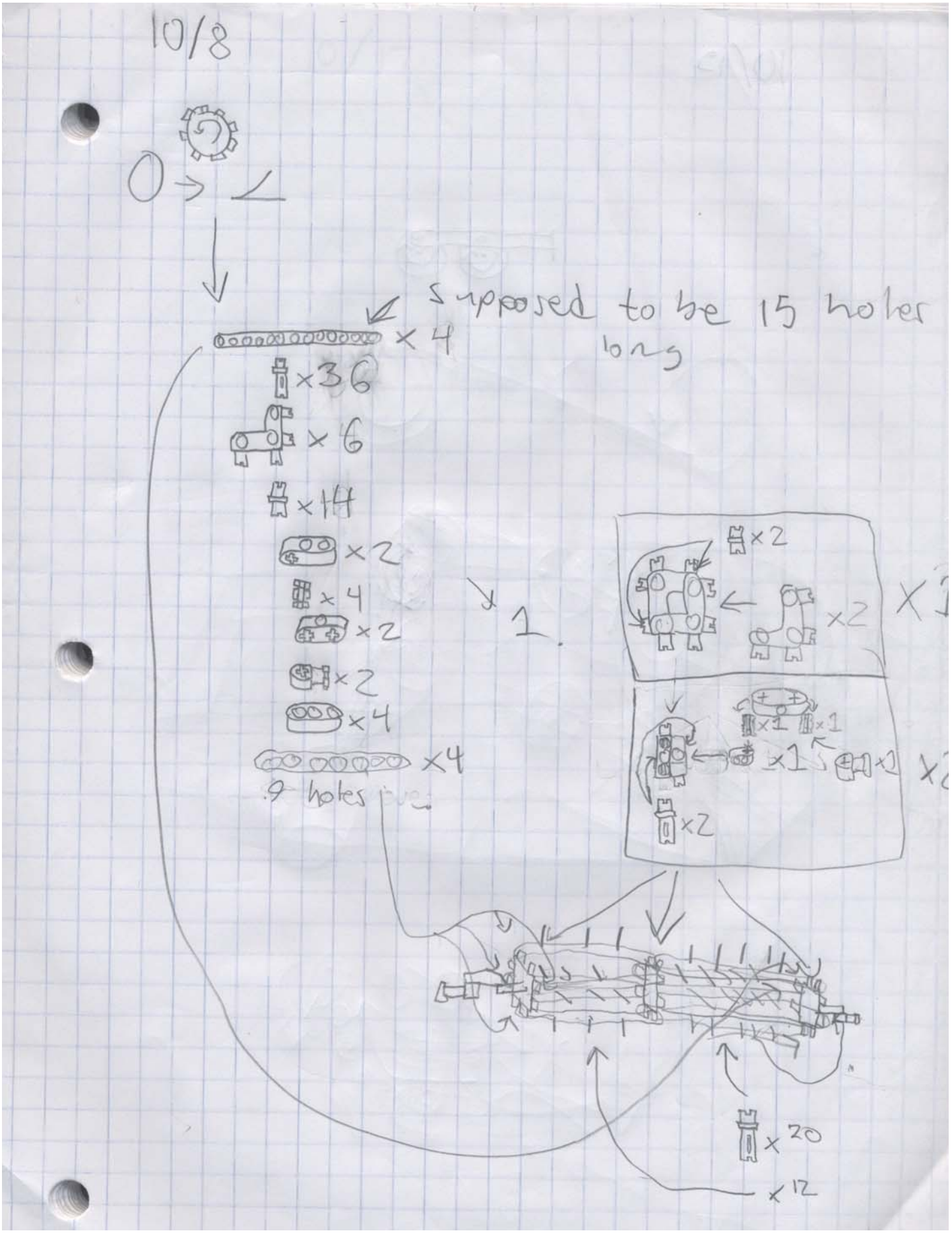
We should decide what technique to use.
We need more design details, not just general requirements.

KISS
3 in. PVC pipe
www.usfirst.org
5-8:00 sat.



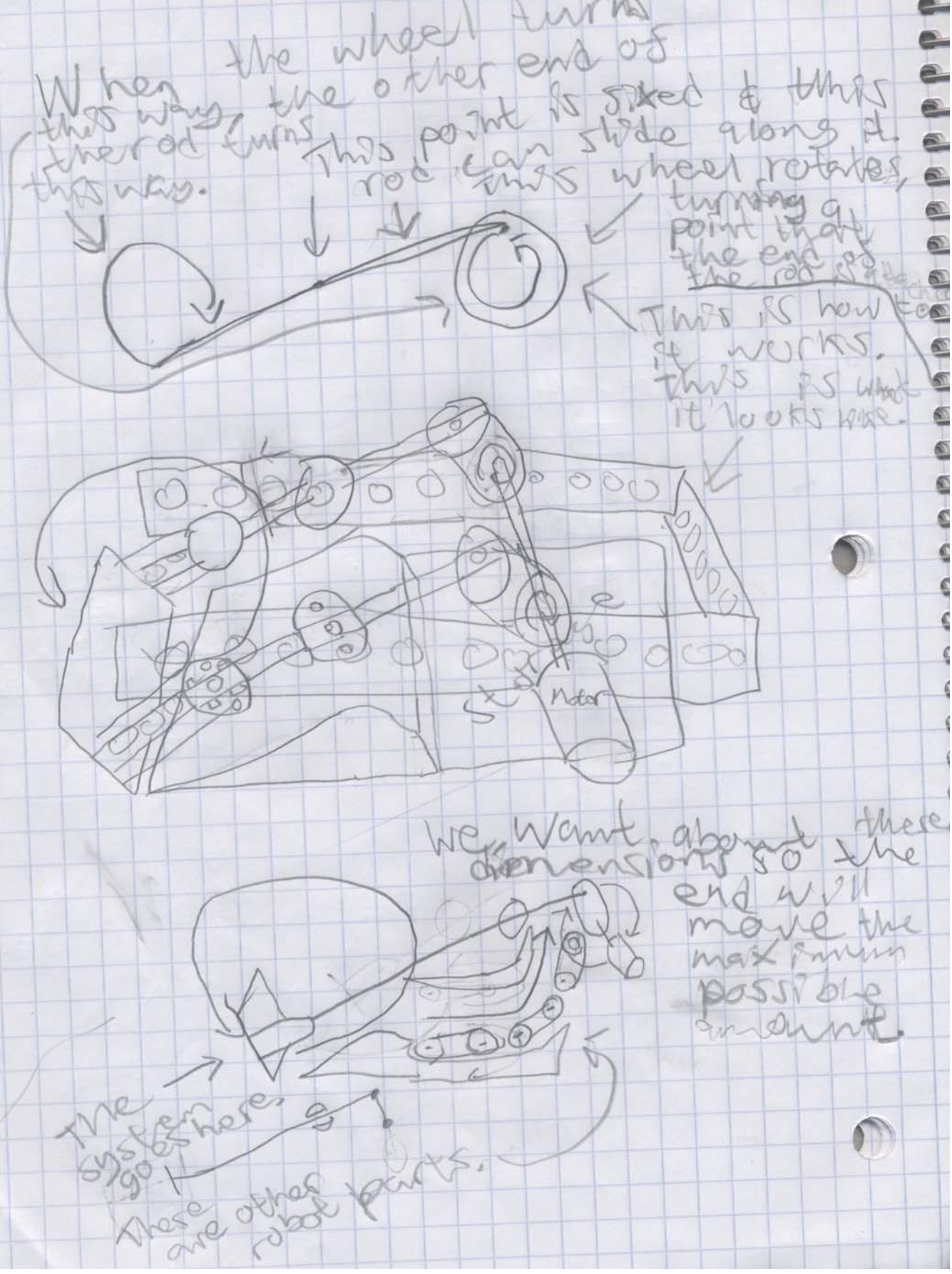






William Nathman 8 Oct 2009: _____

10/22


When the wheel turns this way the other end of the rod turns this way.
This point is fixed & this rod can slide along it.
This wheel rotates, turning a point that the end of the rod is
This is how it works.
This is what it looks like.
Motor
We want about these dimensions so the end will move the maximum possible amount.
The system goes here
These are other robot parts.

12/3

Problem: The ball can't make it past this point

Possible solution: sand down these edges

That wasn't the major problem. The ball can't make it past the 3rd tread

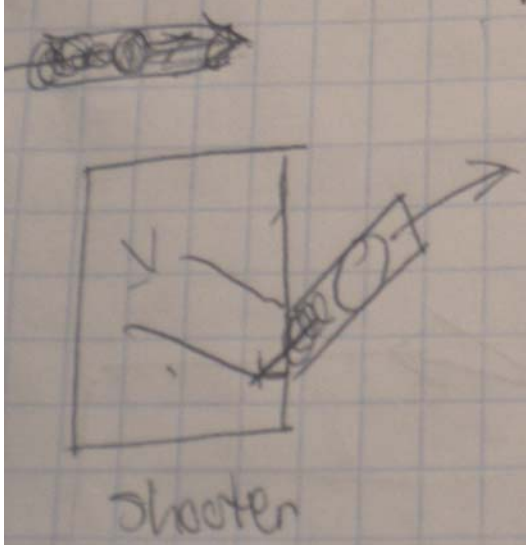
September 24, 2009

- Go for low goals for everything / whole match
- Low goal is defence: high goals & buckets are offence
- No ~~[illegible]~~ sensor or camera tracking.

active targeting system = programmed movement > equal 2
passive targeting system = passive-user controlled mechanics

- Roller system, shooter ~~system~~, ~~rollers~~ belt, spring

Sudo code
- tofu chicken nugget



Design Notebooks

November 28, 2009

- Can be made by 1 or more members of the team
- Entries must reflect thoughts of all members and mentors of the team
- Includes lots of pictures, tables, graphs,
- ~~Needs table of contents~~ Table of contents would be good
- 5-10 journal entries
- Entries include - what the team experienced during the engineering design process, Drawings & descriptions of the robot during different stages of design, Experiences of teamwork & communication during building of robot
- Interesting moments, obstacles & ~~communication during building of robot~~ 'A-ha!' revelations
- Lessons learned from entire 'experience'
- Do not have to appear perfect
- Not a team scrapbook but still shows teams personality & spirit reflecting an ongoing work in process
- Spelling mistakes, ripped out pages, scratches, blemishes, and crossed out things will not be counted against the notebook score as long as they are not excessive

Julia Pyke 28 Nov 2009: _____

9/17/09

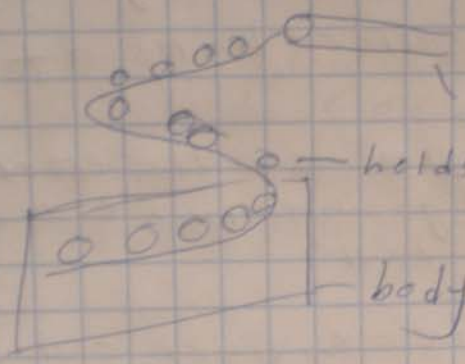
www.usfirst.org

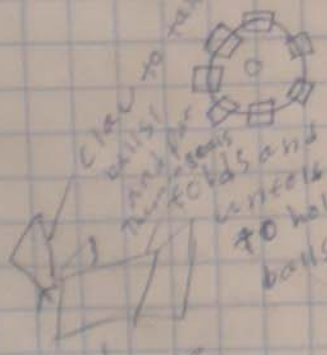
make it simple but can do a good like 90% well

Highest point would probly be to open top goal dumping the balls in to the bottom scoring position

The top defending you can turn the high scoring goals providing there is someone trying to score

during atomineus period or not we can just collect balls and fire it into the outside goal





If we use this wheel we can follow the goal without skitering around but if we get hit we would go sailing but by using the wheel we lose alot of traction and it might not work because of the sticky surface

opening to get balls

We are curently thinking of using a conveyor belt to pick up and store balls

pick up balls

Kenneth Kao

Kenneth Kao 17 Sep 2009: _____

9/19/09

Want to have at least two different programs for each starting position to confuse opponent and maybe even more programs.

No need to have any real mechanism for autonomous period except to pen the balls and maybe collect the balls.

Telli-operated: need mechanism to gather balls, shoot balls, and collect balls at least,

The mentor can look at the clock and tell the drivers to go in front of the balls and when to get the yellow ball.

For a strategy we can just collect balls and get the yellow ball and shoot all of them in to the outer scoring goal.

For dumping balls we can just use the pick up ball mechanism and reverse it and tilt it a little bit but it might make the ball roll back in so its pending.

Need a way to release the balls and close it while the robot is still in front.

Need to find a spot to shoot into the goals or your aim will be wrong.

Rubbery blades to scoop up balls into the conveyer belt.

Something to lift up balls and throw them use a vacuum to suck up the balls.

Kenneth Kao 19 Sep 2009: _____

use a similar mechanism to the golf cart that picks up balls to pick up balls

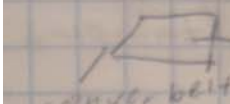
vacume to suck up balls

FUnnel sepentine designg to store balls.

IF we have alot of speed then we can use velocity to run into the balls and pick them up.

For a herding idea if you stop suddenly you can have a flap that is hingjed so the balls can go one way but not another

Another way is to have a conver belt keep on going one way so that balls keep going back



For herding you can have a door then have a moving platform that goes up to load the launcher

we can use the power of the cannon on the lower goal to lift up the ramp letting you dump balls

a good idea to use is to put your picking ball mechanism in reverse and can be used for many different designs

you can use a tube to shoot and put a tilting mechanism to dump or shoot into goals

9/24/2009 24 sept. 2009 6PC

Alternative game design creator

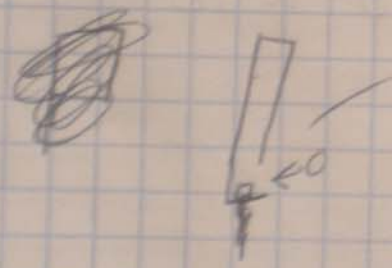
row goal are defensive high goal and out side goals are offensive and yellow balls are offense

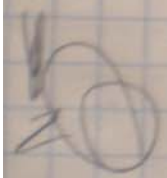
Don't want
Sound
Camera tracking

active targeting is when a motor turns and lets you fire and passive targeting sensor is when the shooter recives the IR beam then you fire

Mechanics
- conveyor belt shooter
- spring
- roller
- Rubberband

Subo code
How to write a code completly theoretical





use one motor for both wheels
low speed fire as well as conveyor belt
high speed fire as well as conveyor

group 2 will figure out how to bend the surgical tubing

Next meeting I need to think about how to make my design better

Kenneth Kao

If the other team doesn't have a good shooting mechanism Then we can make a mechanism to take out the yellow ball in the lower goal,

www.usfirst.org Kenneth Kao

9/25/09

? can we build a mini robot and attach it to the main one like the mini black bird?

Need a list of all parts used needs to be detailed enough so that the a replica can be built from the list alone.

need receipt or something to prove it is a tetrix part

Name NXT official number 4 digets
Electrical components may not be tampered with.
motor wire and power wire may be extended by splicing additional length of wire

welding, soldering, brazing, gluing, melting or attaching in any way not provided within the ~~kit~~ tetrix will not be allowed

Soldering is only allowed on the high technic NXT sensor proto board splicing wires 12 v DC motor connections tinning ends of replacement power wires

9/26/09

? will the flag be counted ~~does~~ Hight measurement?

Robots must display team number from at least 2 sides of the robot

~~Numbers~~ #'s must be at least 3 in high and .5" stroke width contrasting color from back ground

NXT battery must be easily removed. with minimal dissasembly

NXT usb port must be readily accessible

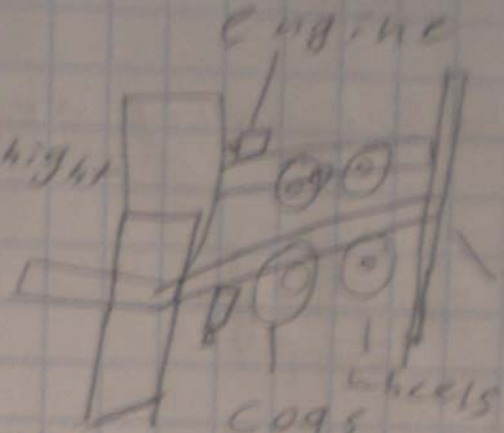
NXT LCD display must be visible

need mounting device to securly hold a flag through the entire match

tube dimensions are .250" OD x .200" ID x 8.250" length with triangular flag 4.000" high x 6.000" wide

Kenneth Kao 26 Sep 2009: _____

10/8/09



100 super motor
100 super motor

70 top motor
100 bottom motor

25 ~ 24.5 inch +3 inch higher

50 on top

100 on bottom +3 inch higher

100 on top

50 on the bottom

25

100 on top

100 on the bottom

25 inch

Kenneth Kao 8 Oct 2009: _____

10/17/09

4" Rim Wheels

2 motors 2 DC motors

2 motor mounts

DC motor connector

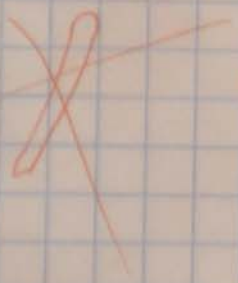
2 12 flower pattern plates

6 of [ ] about this size

~~2 smaller ones of~~

P = parts

escape key = taking off the parts



boxes you move around

tool → line [ ] allows you to

worked on CAD but most of the bigger things in for shooter just need smaller things and to put it together

Names of parts on cad confusing from other names parts were given

Design Notebook 2009
International School of Bellevue

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Julia Pyke
William Nathman
Kenneth Kao
19 September 2009: 5:00pm-8:00pm
Amelia McDermott
Edwin Smith
Brian Tsang
Julia Pyke
William Nathman
Kenneth Kao
24 September 2009: 5:00-7:00pm
Amelia McDermott
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Amelia McDermott

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- Edwin Smith
- Amelia McDermott
- Kenneth Kao

22 October 2009: 5:00-7:00pm
- William Nathman

24 October 2009: 5:00-8:00pm
- Edwin Smith

29 October 2009: 5:00-7:00pm
- Edwin Smith

7 November 2009: 5:00-8:00pm
- Edwin Smith
- Amelia McDermott

12 November 2009: 5:00-7:00pm
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- Edwin Smith

28 November 2009: 5:00-8:00pm
- Edwin Smith

3 December 2009: 5:00-7:00pm
- Edwin Smith
- William Nathman

Programming Notes
- General Programming Notes
- State Machine