

#3705 ~~4-10~~ 4-9-11 ~~12:00pm~~ - 4:00pm  
10:00am Science Potpourri  
@ UAF U  
Community Outreach

We drove to Potpourri after packing up the field elements & batons & Rohan, Aven, babybot, and the Cube.

Peter & I set up in the room on the first floor.

I managed to connect to Bluetooth and Peter set up the stop-motion video and the Field overview movie.

We let tons of little kids drive the robots and people recognized us as the winners of the Inspire Award.

We brought big tubs of LEGOs to entertain the littlest kids.

I spoke to a Channel 13 newswoman who asked about robotics. Hopefully that interview will play on the news somewhere.

Aven saved the day by setting up a secure wireless Samantha network on his iPhone. That way we could run all the robots simultaneously. It went well and little kids crashed the spare robots all over the place.

And we got to eat liquid-nitrogen icecream!!

Channel 13 News (Amy Chausse) will be doing a news story on our team and community outreach! U



University of Alaska Fairbanks Natural sciences building...

*[Signature]*  
4-9-11

#3705 4-11-11 2:15pm - 7:30pm Autonomous SAMUX Robot Rehabilitation (Rohan/Aven's)

### Rehabilitation! U

I took apart my old robot and started rebuilding it. I rebuilt it into an omni-wheel robot. Also, when the building is done I will also program it. It will be my first robotC experience, as bad as that sounds. It won't be too bad since I have programmed a lot with Javascript and other text-based languages U

I took off all the very loose parts on Aven's robot and replaced them tighter... I am revising Aven's base and removed all the servo's. This new and improved tank tread robot will be indestructible to any little kids that ram it into stuff! U (at Sentry Hardware and Science Potpourri).

### Upcoming Demonstration (Community Awareness)

Sentry Hardware in North Pole 8:00am - 12:00pm U

We will be holding a robot scrimmage/demonstration at Sentry Hardware in North Pole/Alaska to raise community awareness about robotics. The Tanana Robotics FLL team who will be traveling to nationals are going to join us. (our former assistant coach and teammate are on this team! U). This event will take place on Saturday April 16, 2011! U

### Major Set Back Problem!

ESMUK BATTERY MUST BE FULL!!! (9 volts!)

This problem caused our color sensors to stop reading the white lines and the sensor to not work at all! U



#3705 4-16-11 7:30 am - 7:30 pm North Pole  
 4-15-11 2:15 pm - 4:30 pm Demonstration  
 11:00 pm - 1:00 am 6 hrs. Aren's B-day! Party!

On 4-16-11 we travelled to the North Pole, Alaska and gave a robotics demonstration in the Sundry Hardware, Mail of the town. The owner of the Gavora Mall in Fairbanks, Alaska came by and offered for us to come and give a demonstration there after our St. Louis, Missouri Worlds trip.



This monitor shows the time lapse of our work in the shop.

Aven's party was SO FUN!!! We got rootbear floats before and then went up and ate a bunch more great taco food, and hamburgers and hot dogs! We jumped on the trampoline and flew each other in the air while heather jumped off 17 times! And Aven's sledding hill is AMAZING! It never ended! I can't wait to go on it with powder next year! !!!1!!1!!

The funnest part was definitely jumping on the trampoline. It was really nice because it started getting warm enough to go outside without jackets. After eating dinner we played Slanwich (which Aven hates) and went sledding. It was a great day!

#3705 4-17-11 8:00 pm - 11:00 pm Fine Tuning Building Robot

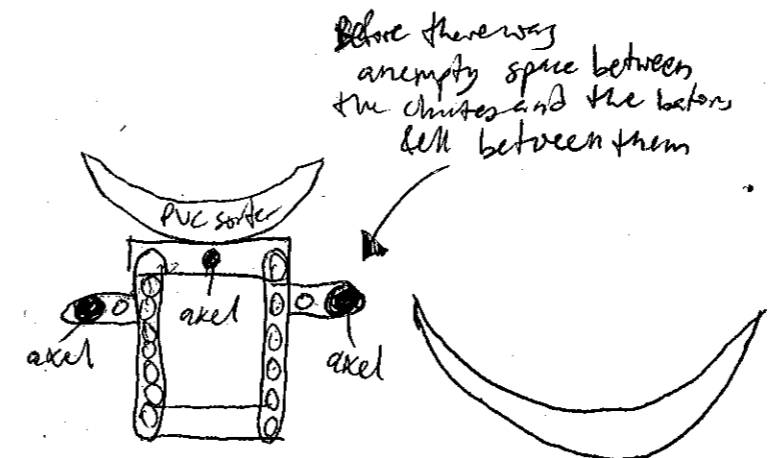
Dispenser Work

New Flaps,  
 Flattened Axel hubs  
 Set Screw Holes! !!

The lexan middle dispenser kept breaking off! so I replaced the set screws in the axel hub with a longer screw! and made the set screw the elongation that holds the batons out of the mid dispenser! !!



Unjammer Baton Sorter



Before there was an empty space between the chutes and the batons left between them

Now there are legs angled pieces holding axels that run the length of the pipes and keep the batons from jamming... Once we get the color sensor working again we can test them! !! I had an idea for the color sensor but the servo was plugged in !! false alarm...

St. Louis Trip!

The demonstrations have prepared us for the things we need to take on the trip and presenting in front of people (judges... we need to bring:

- The two Projector
- Inspire burner
- PVC pipe display
- 9 volt batteries!
- Portal outfits! !!
- Portal 2! !!
- servos
- buttons
- checklist
- notebook
- the boxes!

I am very excited for this trip but the stress and pressure from school and homework is building! The robot is never finished! ... !! !!

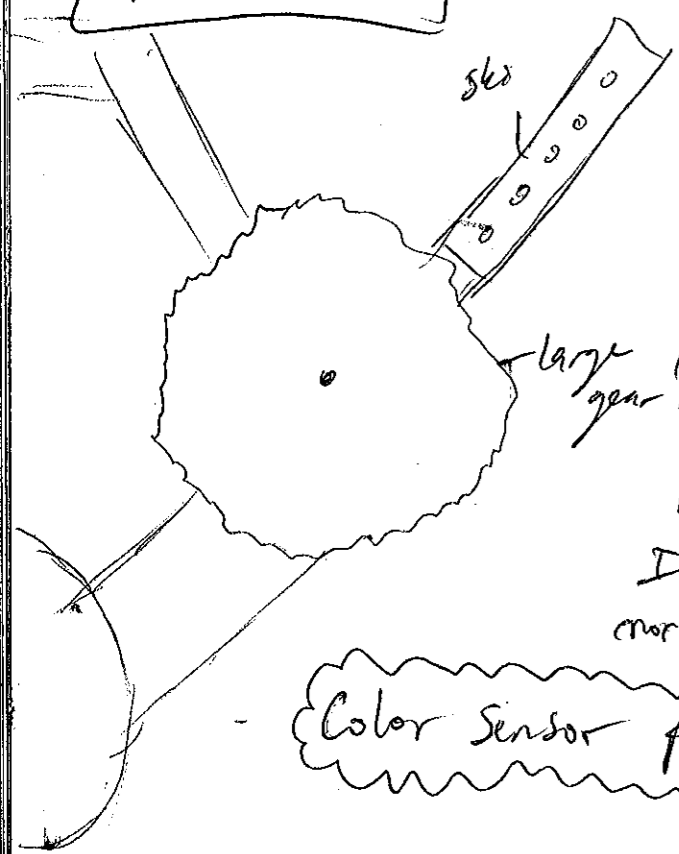
Autonomous Strategy!

Due to the 500 lined autonomous programs... Aren was only able to fit 6 of them on the robot... Blue highs left out but that's okay because it's <sup>closest to our</sup> ~~on the~~ ramp ~~closest to~~ and we want to dispense the ones closest to our ramp so we don't accidentally bump the other team's ramp in the end game and we will be closer to balance.

Include files are too complicated to be used at the last minute but all of the programs are on the robot and ready for competition except for the sorter which still doesn't work. I went to St Louis !!

Portal 2!!!

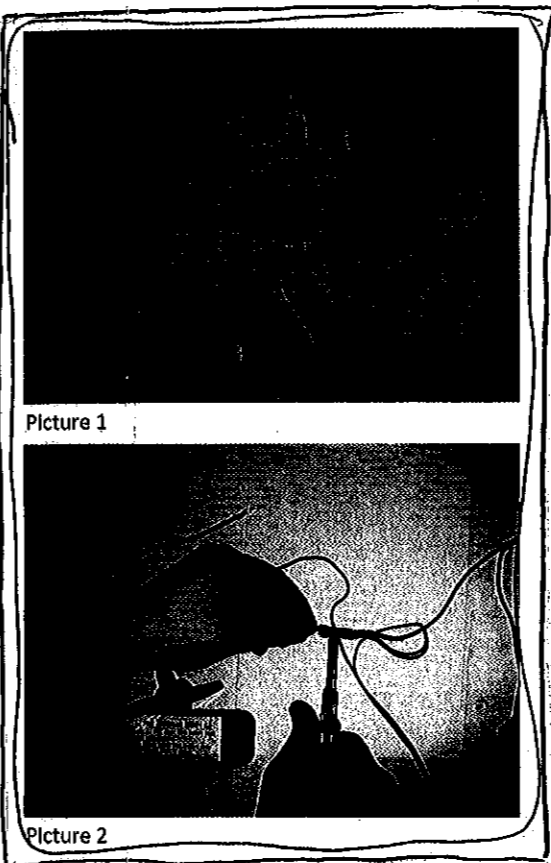
45 wheels!



I am tired of 45 wheel servos burning out! so we put a gear on and a skid to help from crushing the servos... The gear helped but we stopped a servo in our second autonomous run! I have been thinking about switching them to a MOTOR on a feedback loop system with touch sensors but we need one more motor controller or maybe we can string it with the conveyor! !! It will work! I will do that tomorrow morning! :)

Color Sensor problems still! :-(

NO BARRIERS! SAMANTHA WIRING CONFIGURATION



In order to make the power to the Samantha module more direct and unbroken, I soldered the Samantha wires to the battery wires... I think this will improve the power connection, but I am also wondering about the actual white battery connection part... When I tug on the battery the Samantha disconnects, this is due to a poor design in order to switch out batteries... If this were more secure the Samantha would disconnect as often.

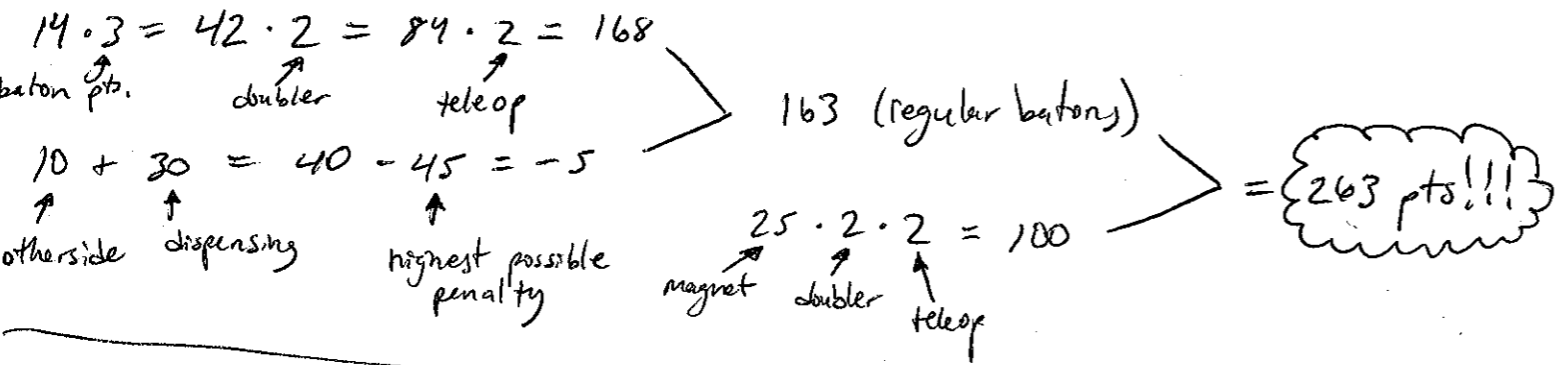
Color Sensor Fix

For some unknown reason the color sensor has stopped returning a green color value. To fix this we simply switched to using the red value instead and now everything works again. :)

Middle Dispenser Swirl!

Best run  
So far! !!

15 batons in roller goal at end of autonomous  
1 baton is the doubler baton



"If we consistently score this perfect autonomous... we will do great at Worlds!!!" (But there is always one thing that goes wrong)

However, there are many inconsistencies with the hardware and software aspects of the robot. The crushers are not as accurate as I have hoped, but they will have to do.

Conditions (Problems)

When Magnet is being sensed

- Collector stops
- Dispenser Mid/High runs continuously (no touch stop).

After Magnet sensed

- collector runs backwards (bringing batons up from ground).
- Dispenser functions normally

When sensing regular baton

- Collector is confused (back and forward)
- Dispenser skips touch stop

#3705 4-22-11 2:00pm - 10:45 TeleOp Strategy

When we go to the MIDDLE & get the DOUBLER in Autonomous we want to use the "same rolling goal, turn it and use the 2 unused tubes. That way the doubler doubles more points.

If we go to a SIDE rack then we can choose to use the same goal or grab a new one.

W/ DOUBLER put goal in a corner, in endgame dispenser corner the rack closest to OUR BRIDGE.

Go to untouched dispenser, search for magnet, grab 5. Then return to endgame corner & dispense, endgame rack, then balance.

Strategy w/ a Partner: ???

Check List!

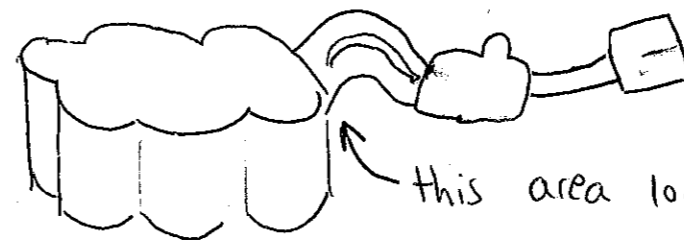
Make sure autonomous is running!  
Make sure screen sees EAT Battery  
SMUX on

battery plugged in  
power switch on  
NXT on

Port 1 wire plugged in  
wiggle battery wires, see if Samantha goes off  
ALASKA sign plugged in/on  
Samantha lights on  
Servo wires plugged in  
conveyor flap not on ground

#3705 4-22-11 TeleOp Results

The battery (12v) is what appears to be the loose connection that makes Samantha bug out.



## Dispenser Skipping Fix

Whenever a baton was sensed during autonomous the dispenser would skip its stop & step. To get around this we added the following lines of code:

```
if (scoreType != 1)
{
    disWait++;
}
```

- This stops the dispenser from moving if it finishes a rotation while a baton is being sorted. The small amount of slowdown this causes is barely noticeable.

The code previously just always increased disWait every iteration no matter what.

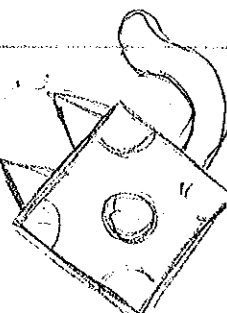
Apr 22 4-22-11

#3705

4-23-11

4:00pm 12:00am  
Mid goal program

# Battery Test

Battery #	Initial Power (Vp)	1st encoder (turn to bridge)		2nd encoder (turn to disp.)		100 power? skip? manual stop?	Successful?
		program	actual	program	actual		
4 	14.773 Vp 13.583 V 13.6	1450	~	1440	~	yes skipped forward 45 wheels yes skipped	no First turn V First turn X
	13.6	1450	too much left	N/A	N/A	skipped, left	First turn X
	13.5	1450	good	1440	too much left	dispenser conveyor belt	2nd turn X
	13.3 V	1450	left	∅	∅		X
	13.3	1450	✓	1440	X	backup 3 Right hit the bridge	~
	13.2	1450	✓	1440	✓	changed backup CANT SENSE DOUBLER	✓~
1	14.747 Vp	1450	X	∅	∅		X
↓ 1	14.5	X 1450	X	∅	∅	missed line, 45 wheel down, turned too much left	X
new color sensor works >	14.4	1450	✓	1440	left (left)	☺	✓
	13.6	1450	✓	1440	~X	~X	~✓
	13.5	1450	X			1st turn left	X
	13.5	1450	✓	1440	little left		~✓
Battery 2	14.364 Vp	1450	✓	<b>1400</b>	little left	missed roll goal	X
Battery 2	14.00	X	X	1400			
	14.00	1450	left a little	1400	tiny left		~

#3705

4-23-11

Continued

# Battery Test

Battery #	Initial Power (Vp)	1st Encoder (turn bridge)		2nd encoder turn to disp		100 power? skip? manual stop?	successful?
		program	actual	program	actual		
B	13.77 Vp	1450	✓	1400	✓	started dispensing before reaching	✓
	13.4	1450	✓	1400	✓	missed magnet	✓
	13.2	1450	X left				X
!! 4 * ♥	14.6 Vp	1450	✓	1400	✓	missed magnet QUAPLAH!!	✓
	13.8	1450	X left				X
	14.1	1450	X left				X
	13.9	1450	RIGHT X			"This battery is interesting"	X
	14	1450	left X				X
	13.9	1450	✓	1400	left	??	X
	13.6	1450	✓	1350	left		~✓
		1350	right	1350	X right	would've hit roll goal	X

#3705

4-24-11

4:30pm - 9:00pm  
47.25 hrs...

Packing Party!

#3705

4-25-11

6:00 pm - competition!

Flying Judges Recap  
Community Reach  
Fundraising

Last Minute Antennas

FINAL TOTAL = 1049.55 HOURS!

Aven added to our existing "goal roller goal and dispense onto roller goal directly program" He made it possible for an identical program but with out the roller goal behind causing a max 45 int. deduction penalty! This is great and will be very helpful in competitions choices are always good! They all have a wait for start and have been tested in SAMANTHA and don't run 100 power!

Autonomous Names on NXT

High Yes; High No  
Low Yes; Low No  
Midnight Yes; Midnight No  
ST Teleop

This is our display pre portable pit that we are taking to St. Louis. In order to prevent another Montana experience... we had a packing party the day before we left!

Jim Hill 4-24-11

Packing Party



# AUSTIN E. LATHROP HIGH SCHOOL

901 Airport Way Fairbanks, Alaska 99701 (907) 456-7794 Fax (907) 452-6735

January 18, 2011

I am writing on behalf of the Lathrop High School Robotics Club to warn you that they are trying to take over the world. Last year the Lathrop Robotics Club qualified two teams for the World Robotics Championship held in Atlanta, Georgia. Only 100 teams out of 1500 teams world-wide were selected to compete. Both Lathrop teams performed well in the competition. This year they want to win.

For the 50+ kids in the club, I want to personally invite you to be a part of this challenging experience. The theme this year is **Robots are COOL!** After demonstrating the robots, describing the competition experience and showing how kids enjoy learning about math and engineering through building robots, people often reply "I see why!". I am sure you will see how exciting learning can be and how the Lathrop Robotics Club wants to take over the world. With your support, I think they can.

There are many ways you can help support the Lathrop Robotics Club. If you have an expertise or manage resources in any of the following areas, you can be a part of a winning team:

- Hardware - sheet metal, plexi-glass, screws, bolts, small hand tools, hex wrenches, tape, rubber bands, zippy ties, pens/markers, tape measures, etc.
- Engineers/Programmers/Architects/Craftsmen - the kids are building a robot that will fit inside an 18" cube. They are small, compact, complex engineering marvels.
- Airline Miles/Car Rental/Hotel - competition winners will compete in St. Louis Missouri this year at the FIRST World Championship Tournament in April.
- Food - brain energy burns lots of calories. The Club meets after school on Wednesdays and the kids make more progress with some brain fuel.
- Financial donations - tournament fees and miscellaneous expenses always pop up. Any amount is greatly appreciated.

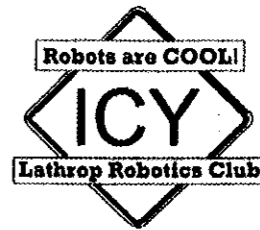
The Lathrop Robotics Club is also looking for opportunities to demonstrate their craft. They are interested in bringing their robots to you to show off their talents. These demonstrations can be for select groups or as a way to draw crowds. We have hands on activities for you including a few robots that you can practice operating.

Please contact one of us to discuss this in more detail or to schedule a time for a demonstration.

Thank you,

Peter Kristeller, Lathrop Robotics Club, 457-1564

Larry Ehnert, Industrial Arts Teacher  
456-7794 Ext. 17169  
larry.ehnert@k12northstar.org



Lathrop High School  
Fairbanks Alaska

FAIRBANKS NORTH STAR BOROUGH SCHOOL DISTRICT

Jim Hill 4-25-11