Robot Design Executive Summary- Fantastic Five #618

Mica: Durability
We believe our robot has sound construction due to the accidental drop tests we have had. No repairs were needed after these "tests". BUT we did experienced one major design flaw. We originally threaded the wires internal, under the brick and the wires rubbed against the motors. 3 weeks ago we discovered we had worn a hole into the wires- YIKES! We corrected this flaw by threading the wires outside.

(Show wires to judges!!)

Jack: Mechanical Efficiency
Compared to previous years, we used fewer Lego pieces but still use 2 color sensors for line squaring, 2 drive motors, 1 medium motor and 1 EV3 brick. We designed a frame to support our tires on both sides and to have an easy place for attachments.

Joe: Mechanization
We have different levels of speed and strength throughout our missions. Our solo demo mission has high speed and strength. We use this if there is not enough time left to run our animal program. The speed goes down in other programs if we are dragging a prize. We have very good accuracy because our frame has a square front and back. We square to a wall at least once in every mission.

Thomas: Programming Efficiency
Our program files are more organized this year since we named our programs with a version number at the end. For example: truck_v4 was the 4th version of how we solved the truck mission. We kept our initial programs short and specific to one task. But we combined tasks starting 4 weeks ago, so our programs are now a little longer.

Our most consistent program is the Truck program. I will run this for you, while Luke talks about the great automation and navigation.

(Thomas Runs Truck Program.)

Luke: Describing what the truck is doing while it is running
Squaring to the north & west wall so the latitude, longitude and direction are known. Robot maintains an exact path using our wall runner. It keeps our robot a specific distance from the wall, the speed of the south tire is slightly higher than the north tire to force the robot to rub STRAIGHT along the wall.

Joe: Design Process

The great thing about our robot's attachments is that we have figured out a way to simplify. Salvage, careers, animals and the plastic bag in the sorter all started with a motorized arm, but we figured out how to combine those 4 attachments into one kinetic attachment. You can see in this binder (show binder).

Laura: Mission Strategy

(Flip binder to strategy sheet) For our Team's strategy, we started with a sheet in which we analyzed how far the mission was from base, if we needed an attachment, if it was easy or hard and how many points it was. These things helped us decide how important the mission was. Then, we each choose one of the important missions and accomplished it with a partner.

Jack: Innovation

We want to give credit to BuilderDude for his inverted drive motor idea. This allowed us to keep our robot low to the ground and small. The newest innovative idea for our team this year is tagging in and out. We have 4 team members participating in every game. This allows the team members to share the pressure and responsibility.

One more innovation we get to use if we advance is our "corner back". It's used for a diagonal start in base. If we advance to the next tournament level, we are hopeful that we can use our "corner back" of the robot to align our robot for the purchasing decisions mission.