

FIRST[®] Tech Challenge

PushBot Build Guide

Part V: Wiring the Robot



Revision History

Revision	Date	Description
1	8/15/2014	Initial Release – by FTC Team #003 Australia, The Southport School
2	9/1/2014	Replaced MATRIX with TETRIX content by former FTC Team #2843, Under the Son
3	8/6/2015	Updated using the new kit of parts and new programming environment.

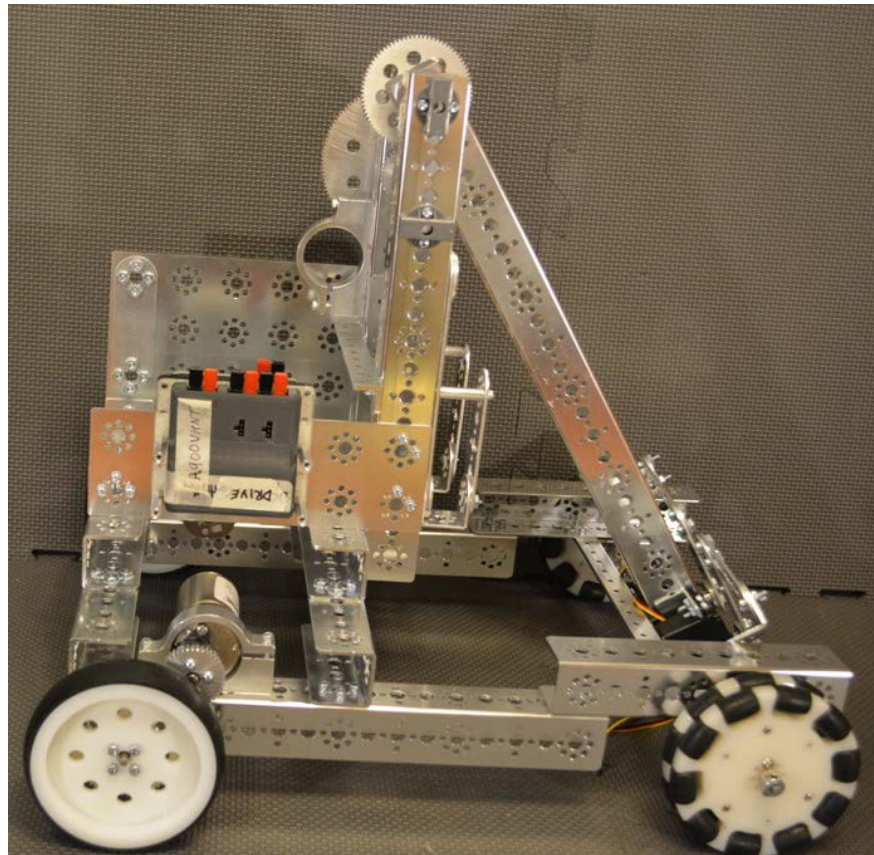
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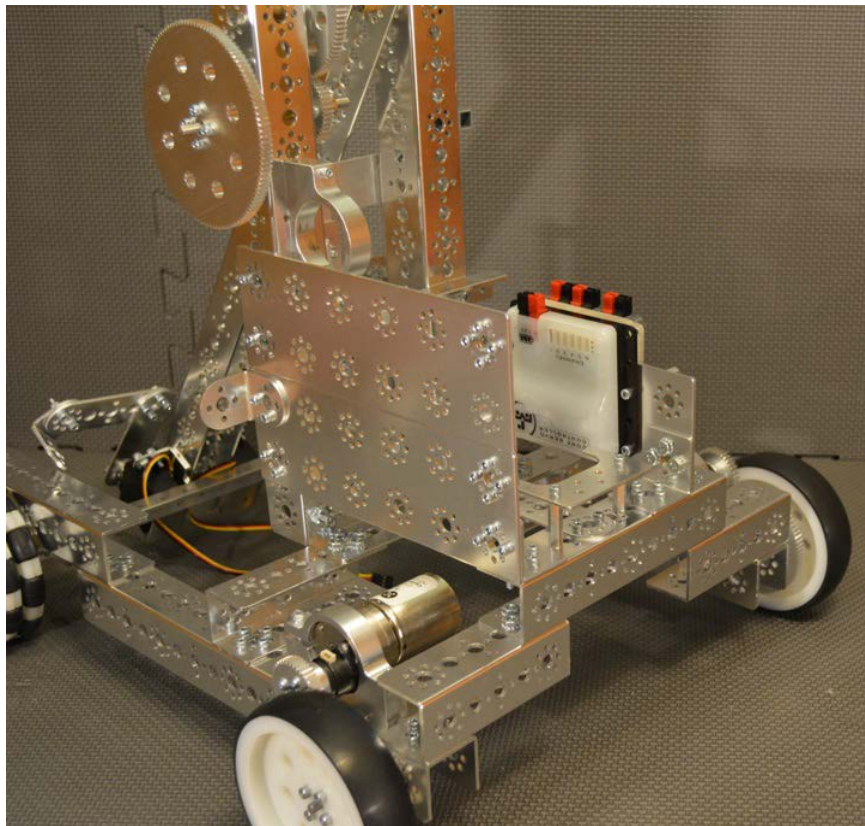
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Wiring the Robot

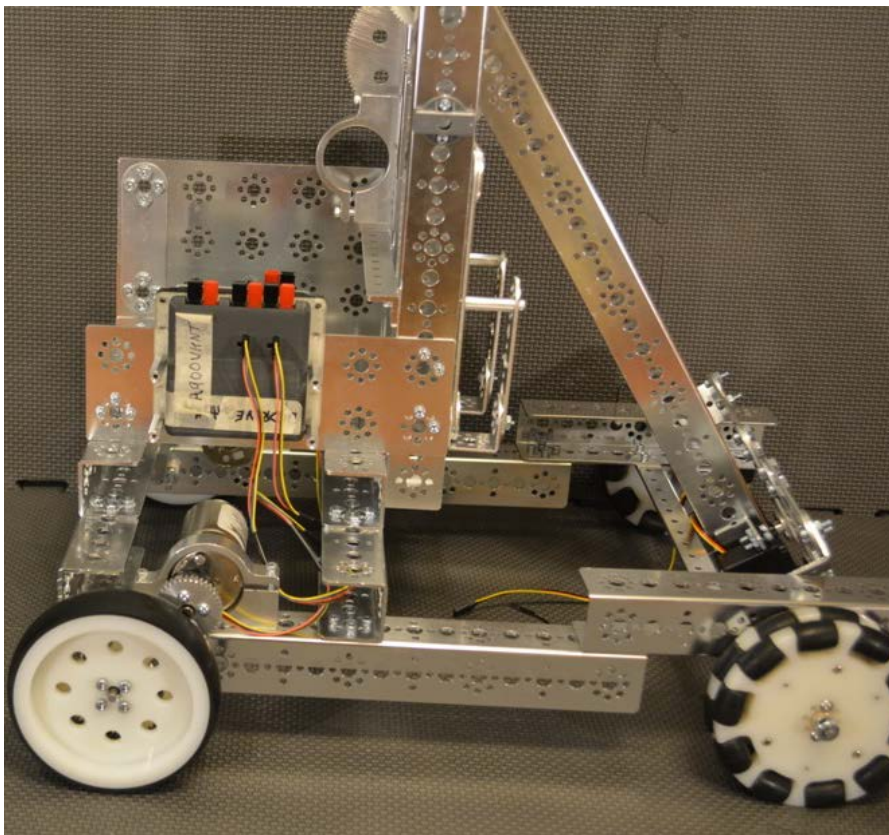
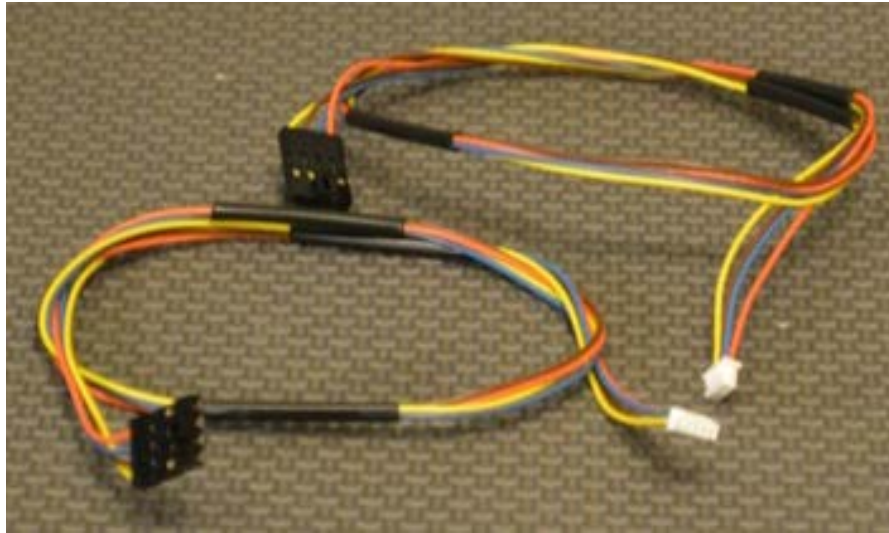
This section will outline the installation of the electronics on the Robot. It will also include finishing the last motor and gear assembly and installing it on the Robot.

Step 1: Core motor controller for the drive (1), core servo controller (1), 32mm stand-off (4), and 1/2" socket head cap screw (4). The second and third photos show the parts installed.

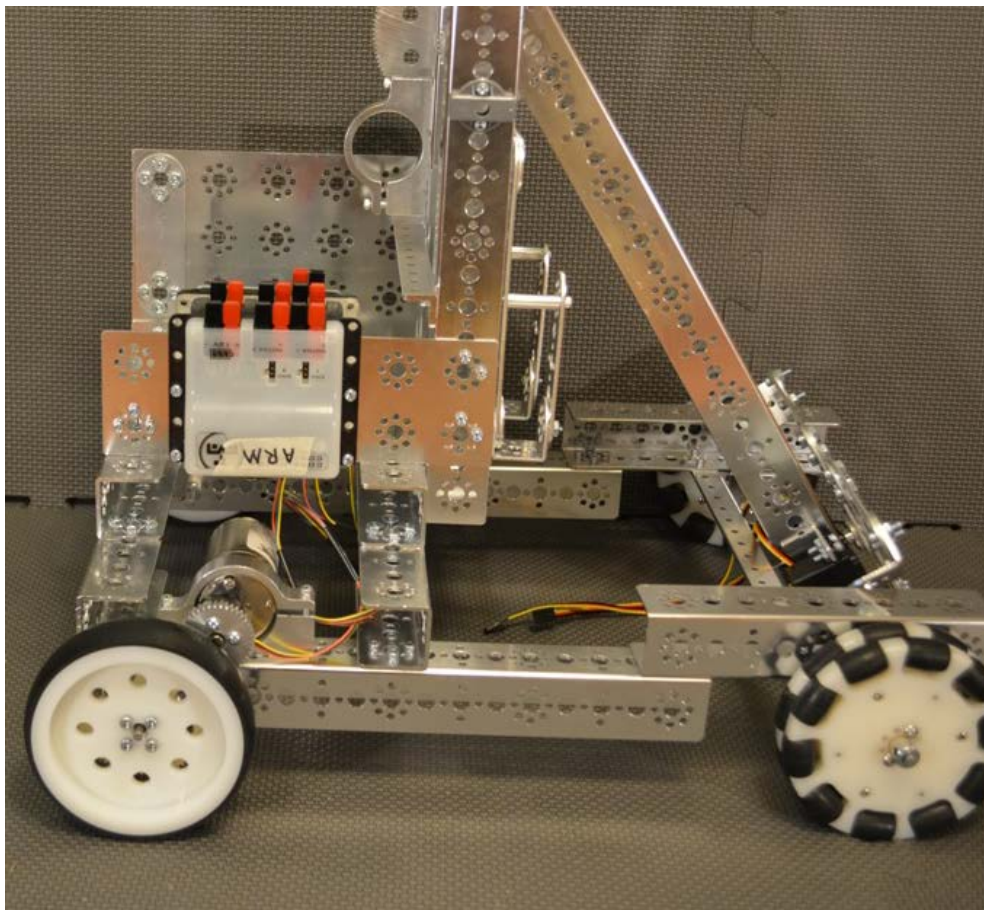




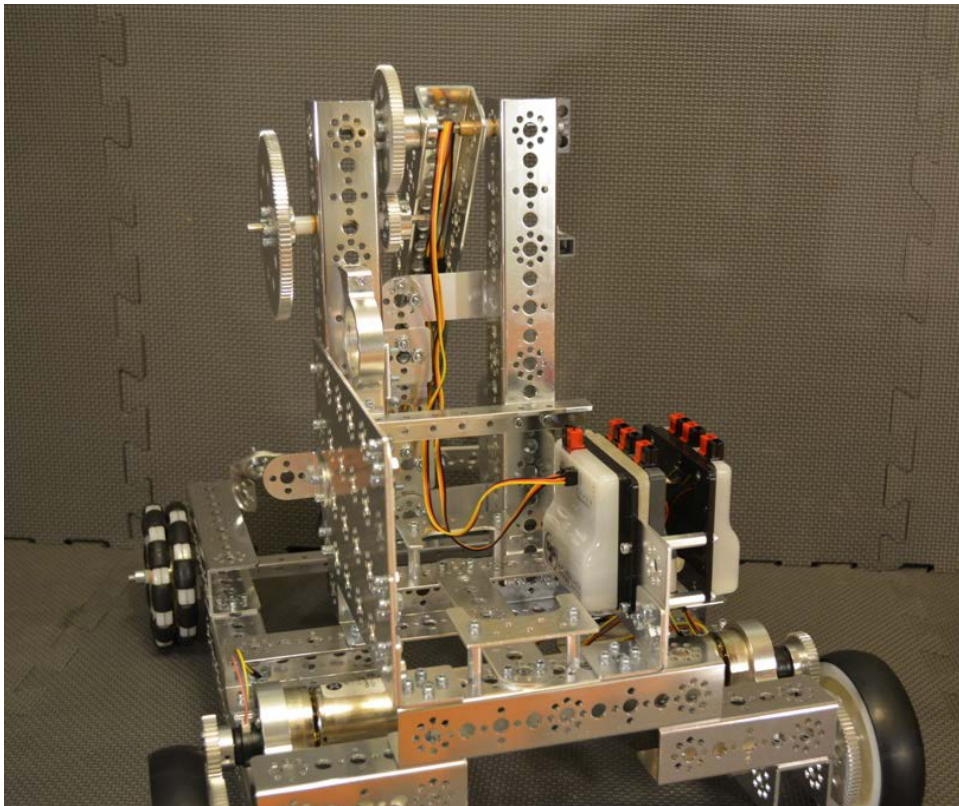
Step 2: Motor encoder wires (2). Plug the end of one wire into the encoder port for motor port 1. Plug the other end into the encoder on the left drive motor. Plug the end of the other wire into the encoder port for motor port 2. Plug the other end into the encoder on the right drive motor. The second photo shows the wires installed.



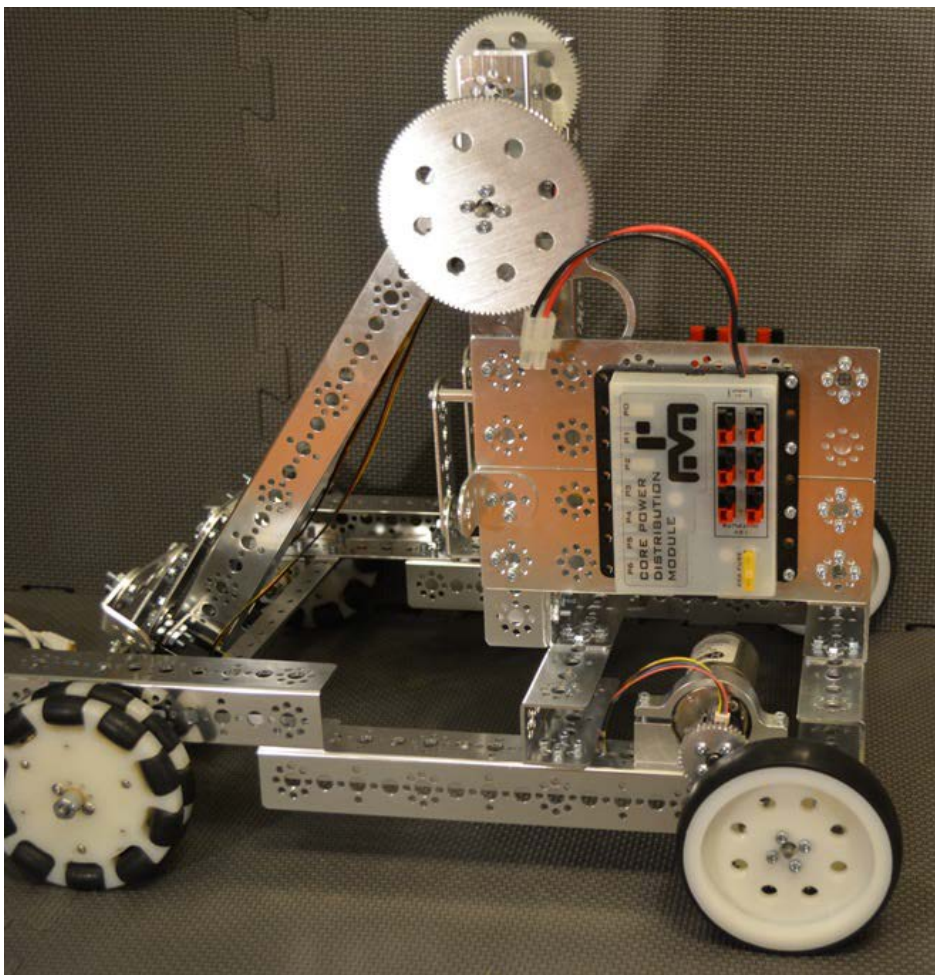
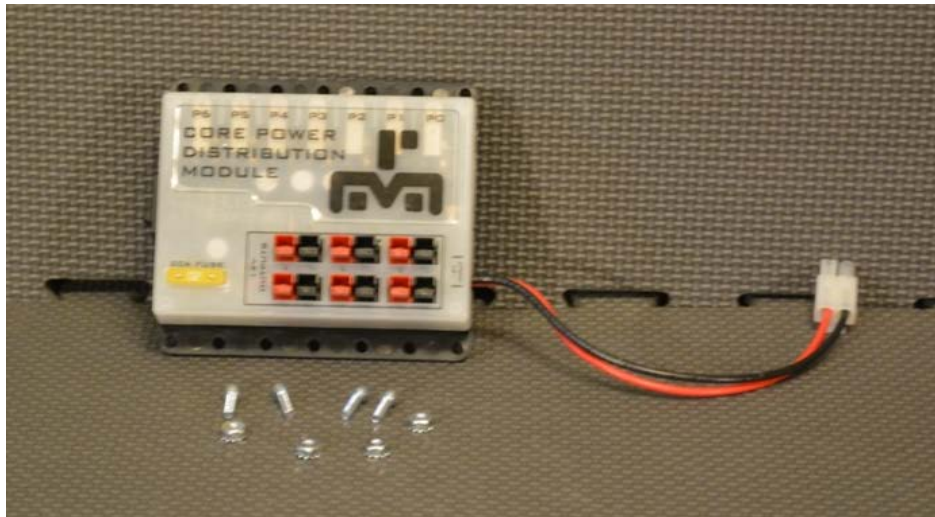
Step 3: Core motor controller for the arm (1) and 1/2" socket head cap screw (4). The second photo shows the parts installed.



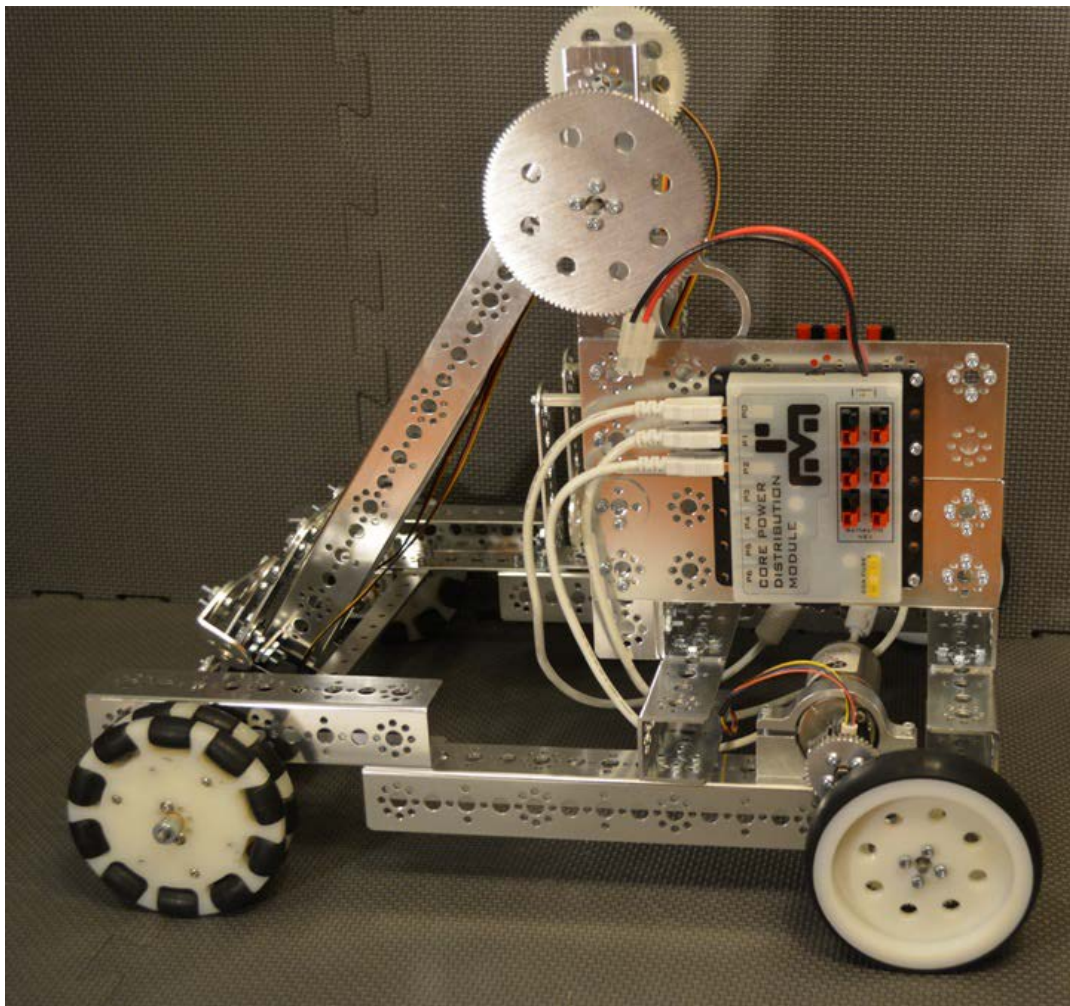
Step 4: Servo extension wire (2). Make sure that when you connect these to the servo wires that you match the colors. Also observe the orientation when installing in the core servo controller (black - b, red - r, yellow - w). The wires will be less likely to get damaged if they are run down the center of the arm channel and over the axel. The second photo shows the wires installed.



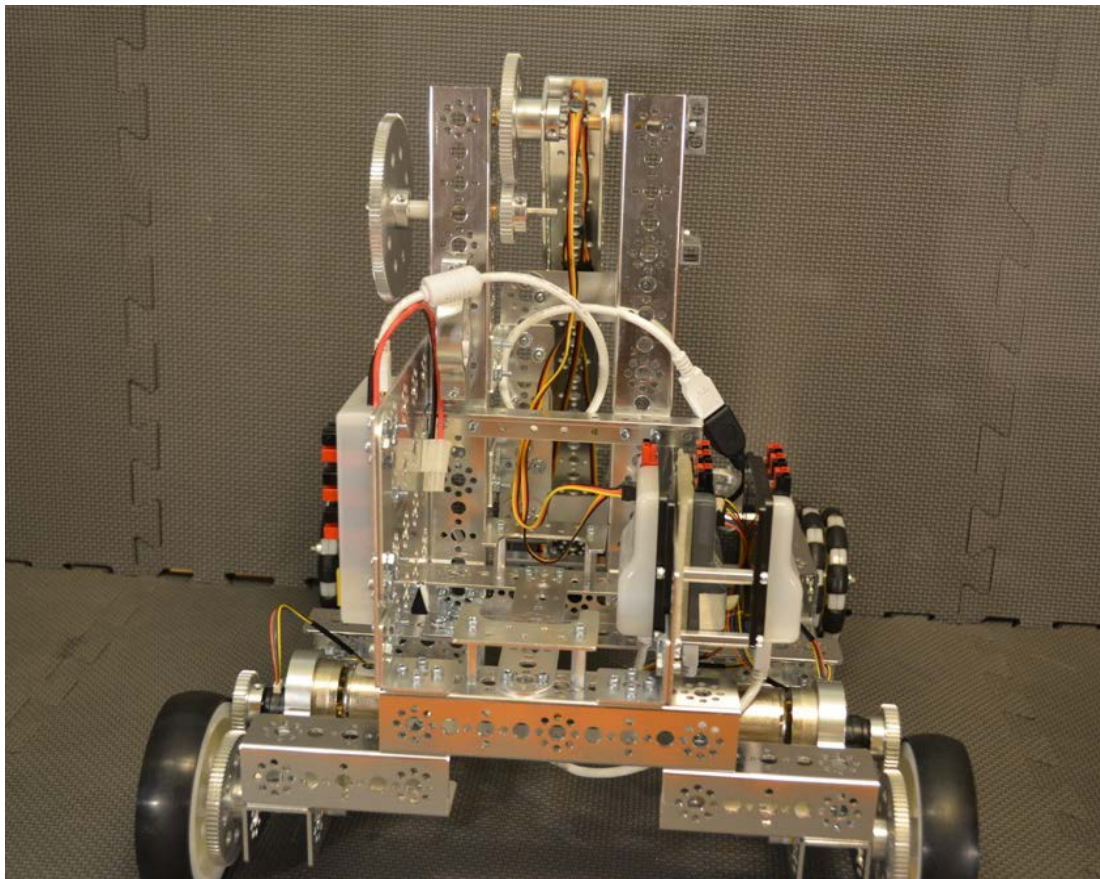
Step 5: Core power distribution module (1), 1/2" socket head cap screw (4), and keps nut (4). The second photo shows the parts installed.



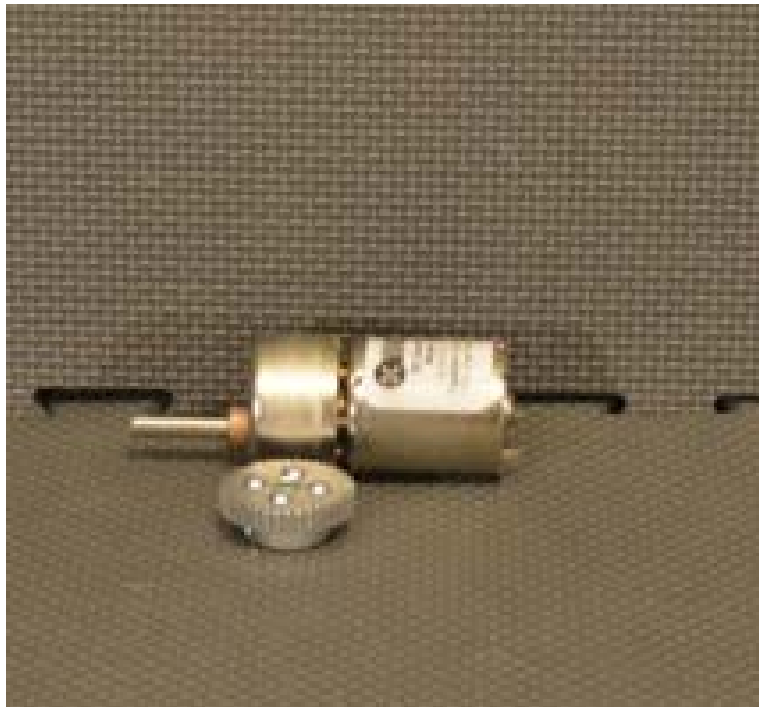
Step 6: USB A male to mini-B USB cable (3). Connect one wire each between the core power distribution module and each of the two core motor controllers and the core servo controller. The second photo shows the cables installed.



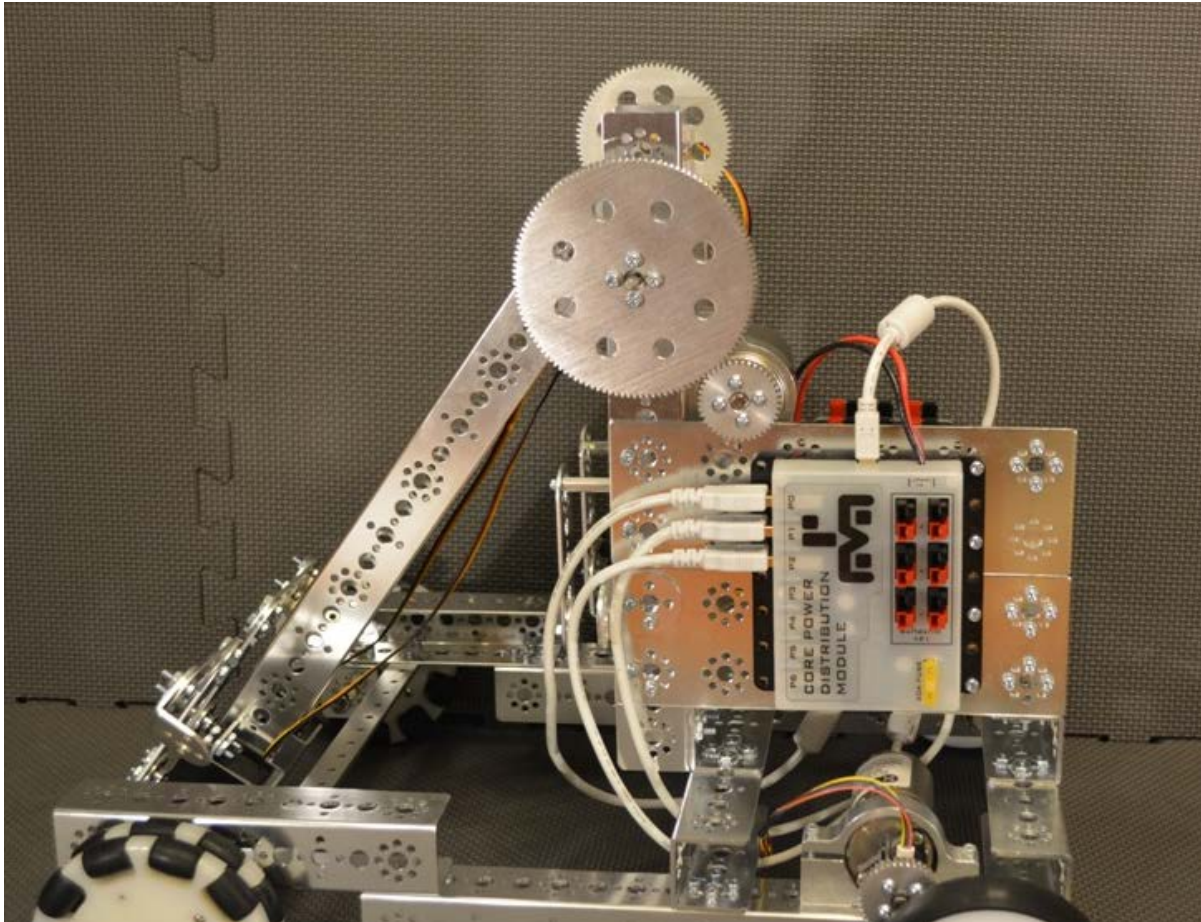
Step 7: USB OTG cable (1), USB A male to mini-B USB cable (1). Connect the min-B end of the cable to the core power distribution module. Connect the other end to the USB OTG cable. Route the other end of the USB OTG cable to the right side of the phone holder assembly. The second photo shows the cables installed.



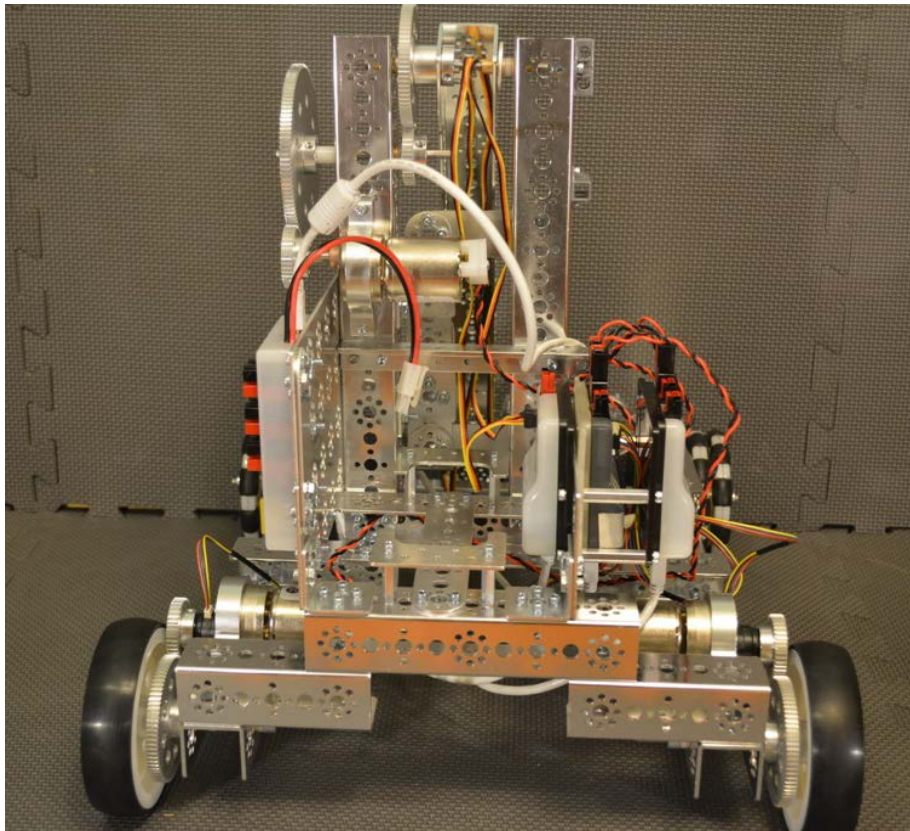
Step 8: Motor hub and gear assembly (1) (made in the Robot construction section, TETRIX DC gear motor (1). The second photo shows the parts assembled.



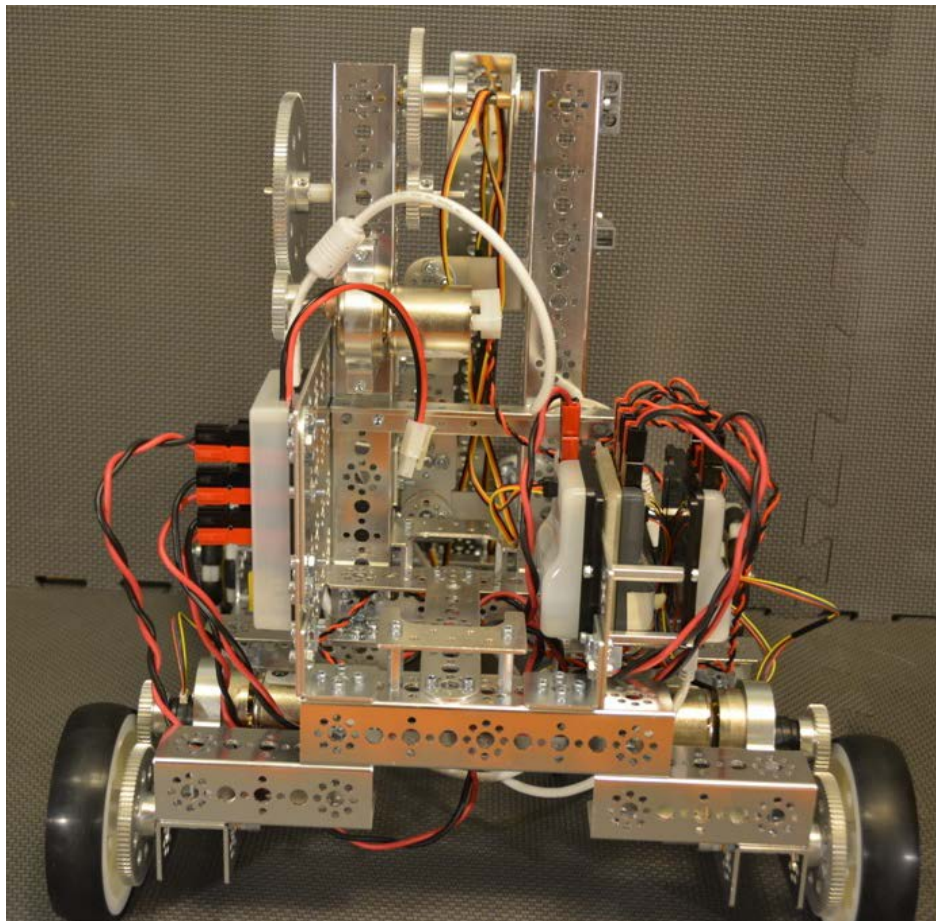
Step 9: Install the motor in the motor mount on the Robot tower. Rotate the motor in the mount to mesh the gears. Do not mesh the gear too tight or the motor will bind. Do not mesh the gears too loose or the teeth will slip.



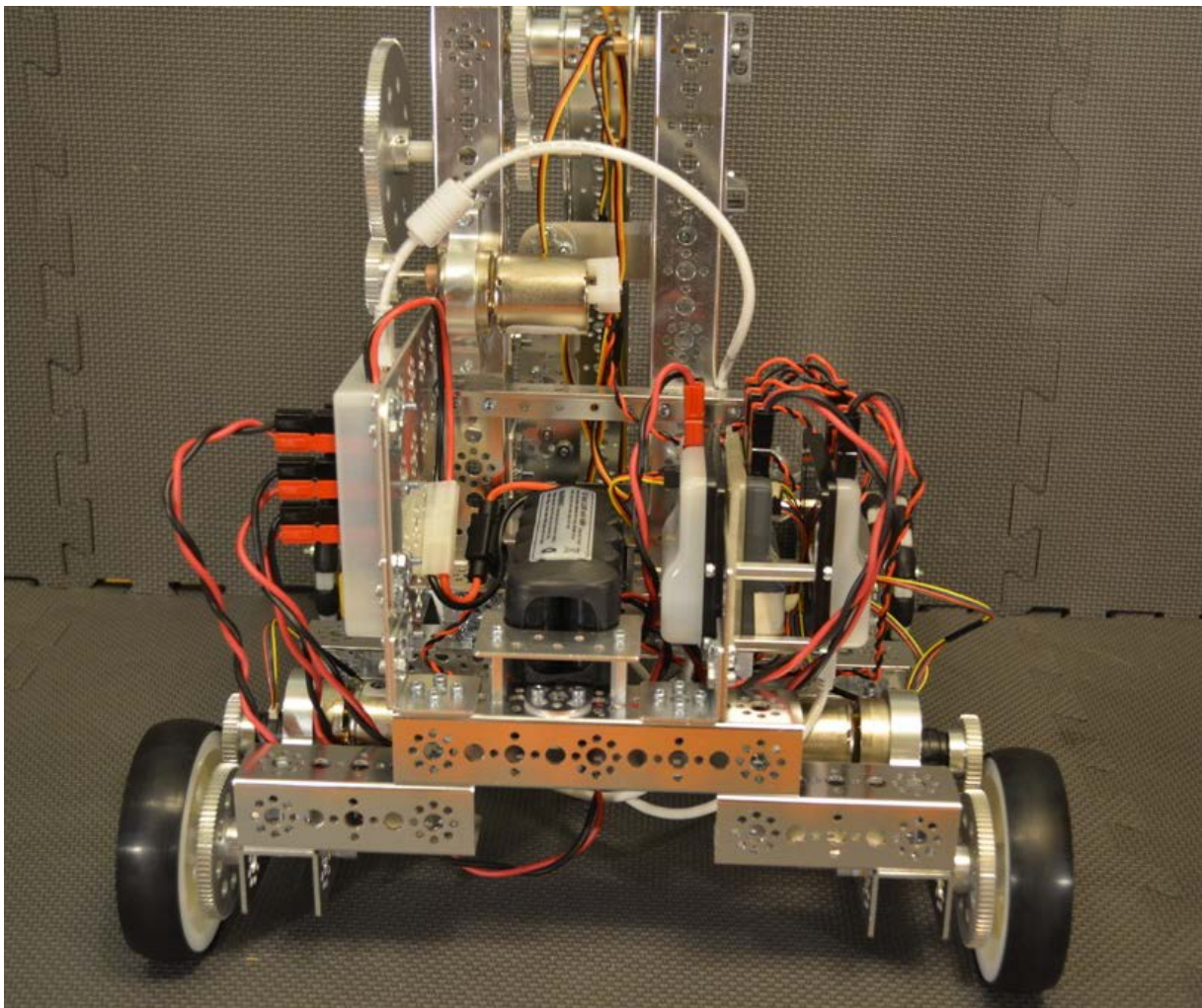
Step 10: DC motor power wire (3). Connect the motor from the left drive to motor port 1 on the drive motor controller. Connect the motor from the right drive to motor port 2 on the drive motor controller. Connect the motor on the arm to motor port 1 on the arm motor controller. The second photo shows the wires installed.



Step 11: DC power wire (3). Connect one end of each DC power wire to any port on the core power distribution module. Connect the other end to the power input port on the core servo controller and the core motor controllers. The second photo shows the wire installed.



Step 12 TETRIX 12V battery (1). Install the batter between the battery clips and connect to the core power distribution module. The second photo shows the battery installed. It would be a good idea to use a zip tie or some other mechanism to hold the battery in place during competition.



Step 13: ZTE speed phone (1) configured as Robot controller. The second photo shows the phone installed (the arm is moved out of the way to show installation).

