Testing Plan

Armor Sturdiness Test

Performed in NORM 191 on late March 29.

Needed equipment: Completed frame and armor plates

1. Attach armor plates to frame.
2. Set assembly on ground.
3. With two spotters present, have one group member stand on the top armor plate slowly, stopping if it begins to fail.
4. Have Group member step down from assembly.
5. Inspect for damage.
6. If undamaged, have group member strike the armor 5 times with blunt side of a hammer.
7. Inspect damage and note severity.
8. If plate remains sturdy, have group member strike 5 times with the claw of a hammer.
9. Inspect damage and note severity.
10. If plate remains sturdy, repeat steps 3 and 4.
11. Inspect plate for additional damage.

Data acquired will be evaluation of armor design durability and will allow group to gauge satisfaction in its ability to protect the robot.

Electrical System Functionality Test

Performed in NORM 191 on March 29.

Needed equipment: completed electrical system with controller, DC power source

1. Charge one of the robot's battery packs using the DC power source.
2. Connect the charged battery to the electrical system to provide power.
3. Sync the controller via Bluetooth and wait for it to connect to the Raspberry Pi
4. Move the analog sticks and press the shoulder buttons. Ensure all motors are reacting as expected. Press emergency shutoff switch. Ensure that system shuts down.

Data acquired will be confirmation that the electrical system is or is not behaving as expected.

Total System Functionality Test

Performed in NORM 191 in late March after completion of assembly.

Needed equipment: completed robot with controller, cabinet from NORM 191

1. Set robot on top of cabinet, such that all wheels and the weapon are not in contact with anything.
2. Connect the robot's battery.
3. Sync the controller via Bluetooth.

4. Move the analog sticks and press the shoulder buttons to ensure that the robot responds as expected.
5. If this is successful, place robot on the ground.
6. Move controls to ensure that the robot can move itself and that all mechanical parts are moving freely.

Data acquired will be confirmation of the functionality of the robot and the moving parts' ability to move freely.

Axle Impact Test

Performed in NORM 191 in late March after completion of assembly and total system functionality test.

Needed equipment: completed robot with controller, polycarbonate sheet

1. One group member holds assembled robot level, 2 feet from the ground, while standing behind a waist high barrier of polycarbonate.
1. Have group member drop the robot.
2. Inspect robot for damage.
3. If no damage is apparent, connect battery and sync controller.
4. Use controls to ensure the robot remains functional and able to move.

Data acquired will be verification of the functionality of the robot and the moving parts' ability to move freely after impact.

Vehicle Speed Test

Performed in NORM 191 in late March after completion of assembly and total system functionality test.

Needed equipment: completed robot with controller, tape, stopwatch

1. Using tape, mark a start and finish line 20 ft apart.
2. Placing the robot behind one line, connect the battery and sync the controller.
3. Have the robot drive forward at full speed. Record time at which it crosses the finish line.
4. Calculate speed in feet per minute.

Data acquired will be the average speed of the robot over a 20 ft distance.

Pushing Force Test

Performed in NORM 191 in late March after completion of assembly and total system functionality test.

Needed equipment: completed robot with controller, force gauge, string

1. Tie string to rear of robot
2. Connect battery to robot and sync controller.
3. Attach string to hook on force gauge and secure gauge in place.
4. Use controller to drive robot forward at full speed.
5. Record force reading.

Data acquired is the total continuous pushing force of the robot.