



# Robot Utility Tank (R.U.T.) Initial Testing Results

# Design Requirements

Table 1: Engineering and Customer Requirements

| <b>Customer Requirements</b> |  |
|------------------------------|--|
| CR1                          | Total production cost under \$2000                       |
| CR2                          | Follow power safety guidelines outlined in IEEE 835-1994 |
| CR3                          | Complete CAD package and BOM                             |
| CR4                          | Design wheel and track system                            |
| CR5                          | Manufacture robot components                             |

| <b>Engineering Requirements</b> |   |
|---------------------------------|---|
| ER1                             | Track length minimum 75% of original    |
| ER2                             | Weight of full assembly under 100lbs    |
| ER3                             | Torque must be 50% capacity of original |
| ER4                             | Power consumption                       |
| ER5                             | Max payload 50lbs                       |

Table 1: Experiments/ Relevant DR's

| <b>Experiment/Test</b>       | <b>Relevant DR's</b>    |
|------------------------------|-------------------------|
| Ex1 – 3.5 Minute Run         | ER4, CR2, CR4           |
| Ex2 – Inclined/ Terrain Test | ER4, CR2, CR4           |
| Ex3 – Payload Test           | ER4, CR2, CR4, ER5, ER3 |
| Ex4 – Speed                  | ER3, ER4, CR4           |

# Top Level Testing Summary

- Tests were created to test overall components working together and to ensure track system performs as designed.
- During Testing we saw our design exceeded initial requirements in run time and traversing various terrains.
- We plan to further test the payload capabilities as well as the overall speed of our design

# Spec Sheet

## Specification Sheet:

| Customer Requirement              | CR Met?           | Client Acceptable? |
|-----------------------------------|-------------------|--------------------|
| CR1: Budget under \$2000.00       | To Date \$1600.00 | Yes                |
| CR2: Is the Electrical safe?      | Yes               | Yes                |
| CR3: Complete CAD/ BOM            | Yes               | Yes                |
| CR4: Design Wheel/ Track System   | Yes               | Yes                |
| CR5: Manufacture Robot Components | Yes               | Yes                |

| Engineering Requirements              | Target         | Tolerance     | Measured Value | ER Met? | Client Acceptable? |
|---------------------------------------|----------------|---------------|----------------|---------|--------------------|
| ER1: 75% of original wheelbase length | 26.25 In.      | +/- 4 In.     | 29.5 In        | Yes     | Yes                |
| ER2: Robot Weight                     | 100 lbs.       | +/- 15 Pounds |                |         |                    |
| ER3: Torque 50% of original           | 11 N.m         | +/- 2 N.m     |                |         |                    |
| ER4: Power Consumption                | 10 min runtime | +/- 2 mins    | 30 Minute      | Yes     | Yes                |
| ER5: Max Payload                      | 50 lbs.        | +/- 10 lbs.   | 40 lbs.        | Yes     | Yes                |

# B-Roll

- [B-roll Drone Video](#)

