Fall Validation Experiment – Test Plan

Location and Equipment

Location	Field Robotics Center (FRC)
Test Area	24 ft x 18 ft area
Equipment	• Leica Robot Total Station (Chuck W.) • Proprietary USB to Leica cable (Chuck W.) • Leica 360 deg. Mini Prism • 24ft by 18ft canvas sheet • Fieldroid robot platform • Water-based white paint • Laptop running Ubuntu 14.04

Test Procedures

[3 min] Pre-Deployment Procedures of the Leica Robot Total Station (Chuck Whittaker)

1. Set the Leica Robot Total Station 10ft away from the starting corner of the field.
2. Set-the Leica Robot Total Station to measure data continuously.
3. Connect the laptop to the Leica Robot Total Station with the proprietary USB cable.
4. Manually aim the Leica Robot Total Station and target the prism mounted on the robot.
5. Initialize tracking functionality of the Leica Robot Total Station with the prism.

[3 min] Pre-Deployment Procedures of the Fieldroid Robot Platform

1. Place the 24ft by 18ft canvas sheet on the ground. Ensure that no obstacles along its area are obstructing a clear line of sight to the Leica Robot Total Station.
2. With its power off, move and place the robot on the starting corner. Face the robot in the direction of the length of the field to be painted.
3. Power the drive-system and on-board electronics of Fieldroid via the red 2-position switches.
4. Ensure that board electronics is receiving power and distributing it to the other components. This is verifiable by looking at the LEDs on the DC power distribution board.
5. Ensure that the on-board radio is powered on and searching for a radio pair. This happens when the on-board radio flashes a green LED.
6. Plug in the command station radio to the laptop connected to the Leica Robot Total Station. This radio displays a flashing green LED indicating that it has power.
7. Check to see that both radios are paired. This occurs if the radios both display a solid green LED instead of flashing green LED.

[1 min] Deployment Procedures

1. Launch the autonomous field painting program.
2. Set the initial values of the robot (position and direction) as the origin of the field and as the zero degree heading (relative North).
3. Input the dimensions of the field to be painted.
4. **[5 min]** Start the autonomous painting operation and wait for the robot to complete the field.
5. Repeat all the steps one more time.