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| **Date:** | 10/16/2014 |
| **Document Type:** | Test Plan Proposal |

# Localization 01 – Test Plan

The purpose of this experiment is to demonstrate the proof of concept and technology capabilities of Fieldroid. A Leica laser tracking gun, a Leica 360° Leica mini prism, and a computer that communicates with the tracking gun will be used in this experiment. This test plan comprises of two separate tests that demonstrates the accuracy and precision of the Leica tracking gun.

## Test 1: Leica Accuracy Tests

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| **Location:** | FRC Lab / Indoor |
| **Testing Time:** | 1 hour |
| **Items Needed:** | * 1x Leica Laser Tracking Gun (From Chuck Whittaker) * 1x Leica 360° Mini Surveying Prism * 1X Computer * 1X Male-to-Male USB Type-A |

### Procedure:

1. Safely set-up tripod. Ensure it is locked and stable.
2. Mount Leica Laser Tracking Gun to tripod.
3. Place Leica 360° Mini Surveying Prism at a distance of 10 meters from the Leica Laser Tracking Gun. Ensure that it is in a clear line of sight with the Leica Laser Tracking Gun.
4. Power on the Leica Laser Tracking Gun and connect it to a computer via USB.
5. Take 5 different readings of the prism’s location. Record reading of the location.
6. Repeat Step 5 for distance intervals of 5 meters between the prism and tracking gun.
7. Stop testing when no more room is available or a distance of 100 meters has been reached.

## Test 2: Leica Precision Tests and Simulation of Path

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| **Location:** | FRC Lab / Indoor |
| **Testing Time:** | 1 hour |
| **Items Needed:** | * 1x Leica Laser Tracking Gun (From Chuck Whittaker) * 1x Leica 360° Mini Surveying Prism * 1X Computer * 1X Male-to-Male USB Type-A * Tape * Prism Mounting Pole |

### Procedure:

1. Mark a square box on the floor with the tape. The dimensions of the box should be 10m x 10m at least. Label corners of the box 1-4.
2. Place the Leica Laser Tracking Gun at a distance of 10 meters away from corner 1 and away from the box.
3. Connect the Leica Surveying Prism to its mounting pole
4. Power on the Leica Laser Tracking gun.
5. Beginning at Corner 1, carry and move chronologically around the corners. Record the path that the prism takes. Ensure that the prism is always in a clear line of sight with the tracking gun. As the pole is being carried around the box, try to maintain the pole at a 90° angle from the ground.
6. Store all localization data acquired for the pass.
7. Repeat Step 5 and Step 6 four more times.

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| Figure 1. Set-Up and Overview of Test 2. |