**Master Test Plan (MTP) for Track Model**

**Overview**

Tests for the Track Model will be organized by user type. The three user categories for tests are: Train Model, HW Track Controller, SW Track Controller, Murphy Testing will be performed periodically during development.

**Track Created**

* **Load Track From File:**
  + Input: .txt/.csv file, suggestedSpeed
  + Expected output: vector<Block\*> created for each line representing data in .txt/.csv files

**Encode Track Data**

* **Data for track encoded:**
  + Input: Track data
  + Expected output: a representation of the track data encoded into a uint64\_t

**Encode Beacon Data**

* **Data for beacon encoded:**
  + Input: Track data
  + Expected output: a representation of the track data encoded into a uint16\_t

**UI Tests**

* **Load Track:**
  + Input: filename
  + Expected output: data from .txt file is transformed into vector<Block\*>
* **Select Block:**
  + Input: clicking on block to be selected and select block button
  + Expected output: UI is correctly populated with data on Selected Block
* **Fix Rail:**
  + Input: fix rail click
  + Expected output: rail status is changed to 1 and displayed to UI
* **Break Rai;**
  + Input: break rail clock
  + Expected output: rail status is changed to 0 and displayed to UI
* **Fix Circuit:**
  + Input: fix circuit click
  + Expected output: circuit status is changed to 1 and displayed to UI
* **Break Circuit:**
  + Input: break circuit click
  + Expected output: circuit status is changed to 0 and displayed to UI
* **Fix Power:**
  + Input: fix power click
  + Expected output: power status is changed to 1 and displayed to UI
* **Break Power:**
  + Input: break power click
  + Expected output: power status is changed to 0 and displayed to UI
* **Heater on**
  + Input: heater on button click
  + Expected output: heater temperature increases and heater status changes to 1
* **Heater off**
  + Input: heater off button click
  + Expected output: heater temperature decreases and heater status changes to 0
* **Populate Display**
  + Input: when system wide update occurs, or select block is clicked
  + Expected output: all displayed boxes will populate with correct data

**Train Presence**

* **Train Detected**
  + Input: track circuit data from the train
  + Expected output: trainPresence = 1 on appropriate block

**Template for Tests**

* Templates for each test will contain the outcome of the test (Pass or Fail), the specific outcome expected versus what happened, when the test was performed and which user requested it. This data will be given as a text output in several lines of text after a test.

| **Test Case** | **Inputs** | **Expected Output** | **Pass/Fail** | **Failure Description** | **Tester** | **Data Tested** |
| --- | --- | --- | --- | --- | --- | --- |
| **Track Created** | | | | | | |
| Load track from file | Track is created from .txt/.csv file and suggestedSpeed from HW/SW track controller | vector<Block\*> is created and filled with Block\* according to each line in the .csv/.txt. | pass | - | Matthew M. | 12/13 |
| **Encode Track data** | | | | | | |
| Data for block is encoded properly | Block data to encodeTrackCircuitData() | A uint64\_t is created and accurately represents the data needed from each block | fail | - | Matthew M. | 12/13 |
| **Encode beacon data** | | | | | | |
| Data for beacon is encoded properly | Block data to encodeBeaconData() | A uint16\_t is created and accurately represents the data need from each beacon | fail | - | Matthew M. | 12/13 |
| **UI Tests** | | | | | | |
| Load track button | .txt/.csv file and load track button click | Track is loaded and list of blocks is put in select block list | pass | - | Matthew M. | 12/13 |
| Select block button | Select block from menu and select block button click | Block is selected from menu and proper stats for that block are updated in display boxes when select block is clicked | pass | - | Matthew M. | 12/13 |
| Fix rail button | Fix rail button click | Status of rail is updated to 1 and displayed on UI | pass | - | Matthew M. | 12/13 |
| Break rail button | Break rail button click | Status of rail is updated to 0 and displayed on UI | pass | - | Matthew M. | 12/13 |
| Fix circuit button | Fix circuit button click | Status of circuit is updated to 1 and displayed on UI | pass | - | Matthew M. | 12/13 |
| Break circuit button | Break circuit button click | Status of circuit is updated to 0 and displayed on UI | pass | - | Matthew M. | 12/13 |
| Fix power button | Fix power button click | Status of power is updated to 1 and displayed on UI | pass | - | Matthew M. | 12/13 |
| Break power button | Break power button click | Status of power is updated to 0 and displayed on UI | pass | - | Matthew M. | 12/13 |
| Track heater on | Heater on button click | Status of heater is updated to 1, temperature increases, and display is updated on UI | pass | - | Matthew M. | 12/13 |
| Track heater off | Heater off button click | Status of heater is updated to 0, temperature is back to ambient, and display is updated on UI | pass | - | Matthew M. | 12/13 |
| Populate display boxes | And button click, or UI update | Stats for current block are properly updated and displayed in all display boxes | pass | - | Matthew M. | 12/13 |
| **Train presence** | | | | | | |
| Train presence detected | Train distance traveled | Proper block depending on train distance traveled has trainPresence = 1 | pass | - | Matthew M. | 12/13 |