Test plan name:	Motor Direction Test
Test plan number:	E01
Revision number:	2
Date of last revision:	21 Feb 2017

Introduction:

This plan is a test plan in for the electrical subsystem. The purpose of this plan is twofold. Primarily, its purpose is to ensure expected operation of the motors with respect to direction. A low signal on the direction pin of the stepper driver should cause the motor to spin in a certain direction. A high signal on the direction pin should cause the motor to spin in the opposite direction. The second purpose of this plan is to establish the direction that the motors rotate. For instance, we would like to establish which logic level on the direction pin, high or low, will make the motor rotate clockwise. (The direction of rotation is determined facing the shaft.)

No testing equipment is required outside of basic lab equipment. There is no impact of this test on the project budget. This test is a basic test for the electrical subsystem.

Features to be Tested

- The direction pin of the MA860H stepper driver.
- The direction pin of the TB6600 stepper driver.

Approach

The electrical subsystems will be wired up as per the wiring diagram below.
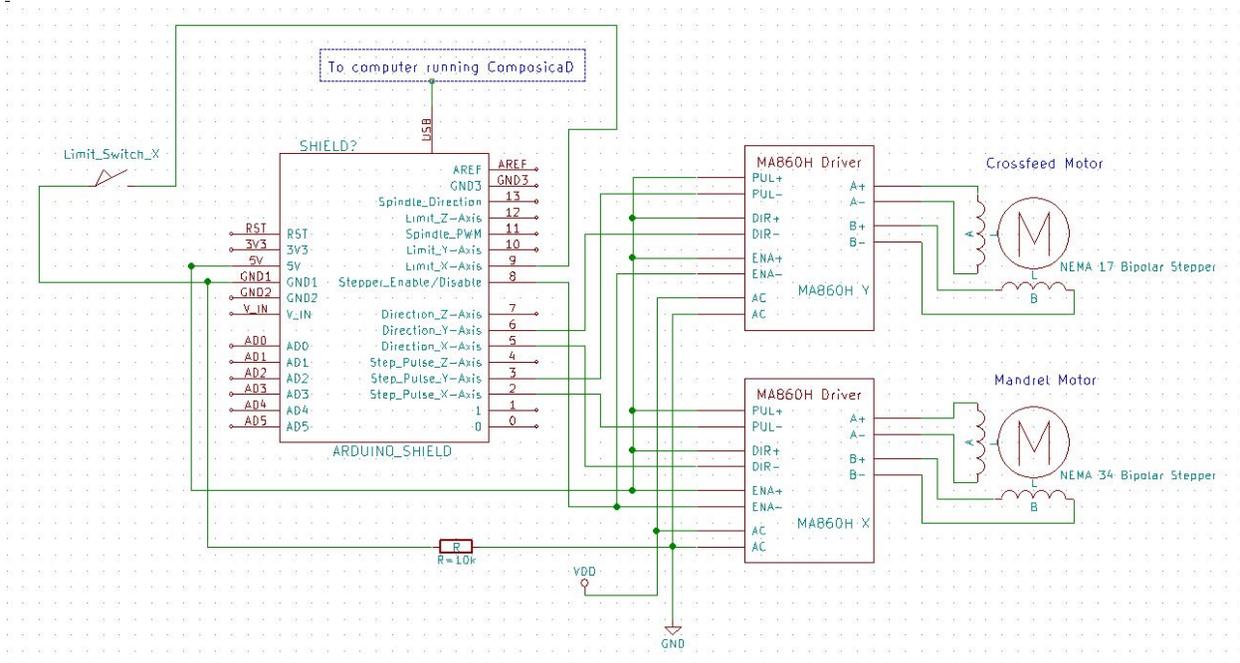
From the Arduino, a G code command will be sent to make the motors rotate in one direction. The direction of each motor should be noted. Another G code command will be sent to instruct the motors to rotate in the other direction. Again, the direction of each motor should be noted. Direction of motor rotation should be recorded looking at the motor from the shaft end.

Data:

Condition	Direction
MA860H, low DIR signal	Counterclockwise
TB6600, low DIR signal	Clockwise
MA860H, high DIR signal	Clockwise
TB6600, high DIR signal	Counterclockwise

Pass/Fail Criteria:

Requirement	Pass/Fail
Motor driven by the MA860H switches direction as expected.	Pass
Motor driven by the TB6600 switches direction as expected.	Pass

Conclusions:
We have established that the motors are working as expected. The rotation of the two motors switches when the direction signal is switched from high to low or from low to high. For a high direction signal, the two motors will rotate in the opposite direction. This could be fixed by reversing the A coil and the B coil wires for one of the motors. However, the motors are currently wired exactly as specified by the documentation, so our team has opted to retain the current wiring configuration.

Additional Considerations:
This information will be important when configuring the GUI to actually set up a winding file.