**Microstepping Research**

* Given a 4-phase (2 coil) stepper motor, the coil currents operate either at +Imax or -Imax in coils A and B. Half-stepping, Quarter-stepping, and the like operate the coils at intermediate current levels to achieve increased positional resolution
* Given that intermediate current levels are used to position the stator between full-steps, the resulting torque is reduced. This is the trade-off: torque for resolution

Sources of Error

* Motor Pole Placement results in an error every 4 steps and every full revolution. This error is approximately +/- 0.5 steps which results in +/- 0.9 degrees
* Exceeding the motor torque requirements results in missed steps and stalling
* Motor sticktion (static friction) may result in lost steps because of exceeded torque reqs
* Motor backlash (gaps between internal gearing) may result in positional inaccuracies
* Steps will be missed if the voltage is either too high or too low. Motors should be re-tuned to 0.2A (200 mA)

Conclusion

* Positional accuracy of the stepper motors seems poor. This might be improved by using microstepping, but the above issues (lower torque, inevitable errors) should be considered
* Lubricate the cube, and adjust the potentiometers of both steppers to expected levels. Then execute a test sequence on both motors to evaluate the error levels.