Memo

**To**: Dr. Mahinfalah

**From**: A.R.C. - Logan Beaver, Justin Campbell, Tyler Paddock, and Ron Shipman

**Date**: January 14, 2015

**Re**: A.R.C.’s Update for the Week # 5

**Problem Statement:**

Milwaukee School of Engineering’s mechanical engineering students take controls classes in their senior year. Having an automated control system would be a beneficial tool to explore controls theory. An application of Automatic Control Systems is the use and development of robotics. Development of a robot with pneumatic locomotion for the Milwaukee School of Engineering’s controls classes would give students a first-hand experience with complex control systems.

**Current Progress:**

* Final design layout selected
* General pneumatic circuit developed
* Kinematic model of robot motion
* Draft of electrical components and motherboard
* Initial dynamic equations developed
* Prototyped and tested control components

**Tentative Schedule:**

* Verify dynamic model with hand calculations -Week 5 Winter
* Determine required cylinder specifications from dynamic model -Week 6 Winter
* Calculate electrical and pneumatic circuit specifications -Week 6-8 Winter
* Determine maximum forces and torques applied at each joint -Week 6-8 Winter
* Test cylinder response for control development -Week 8 Winter
* FE analysis on chassis and leg components -Week 7-9 Winter
* Finalize leg design and materials -Week 9 Winter
* Assemble and test leg subsystem -Week 1-2 Spring
* Assemble chassis and mount electrical and pneumatic components -Week 1-2 Spring
* Attach legs to chassis and test overall design -Week 4 Spring
* Implement creep and walk gaits on robot -Week 5-10 Spring