

Risk	Effect	Cause	Chance of Occurring	Severity	Importance	Action to Mitigate	Owner
Inadequate Muscle Motion (Force, Impulse)	Lack of or sub-par jumping ability.	Limited time for muscle material data collection.	4	5	20	Rescope project to reduce weight (tether).	Andrew
Muscles cannot overcome the weight of the pressure vessle	Lack of or sub-par jumping ability.	Customer desires unthered robot with \$400 budget.	4	5	20	Rescope project to allow tether or increase budget to purchase a strong lightweight tank.	Phil
Matlab simulation does not yield results	Wasted time, unable to quickly predict system response.	Not enough time, modeling discrepancies .	4	4	16	Rely on trial and error testing of prototype.	Jeff, Sean
Inadequate Muscle Displacement	Lack of or sub-par jumping ability.	Limited time for muscle material data collection.	3	5	15	Rescope project to reduce weight (tether).	Andrew
Inadequate Air Flow	Lack of or sub-par jumping ability.	Bottle-knecking at fittings.	3	5	15	Keep all fitting/hose diameters >=muscle inner diameter.	Phil
Dynamics Design	Proper jump motion is not achieved.	Poor leg design	3	5	15	Check with Matlab simulation to confirm link lengths and initial angles.	Jeff, Sean
Long Lead Time	Unable to complete robot construction due to lack of certain ordered parts.	Natural for some unique parts. Poor group planning	2	4	8	Make sure to plan on ordering specialized parts promptly. Include shipping times in planning.	Group
Mismanaged Budget	Could result in changes in development.	Poor group planning and limited funds.	2	4	8	Discuss and track all purchases as a group.	Jeff
Mismanagement of Time	Unable to complete some aspects of project.	Poor group planning. Lack of time management.	2	4	8	Plan out all aspects of development and testing properly for allotted time.	Jeff
Air Muscle Performance Failure	Muscle tears or expands in an unexpected manner leading to poor dynamics and function	Poor construction protocol. Non-uniform construction quality of muscles.	2	4	8	Take great care when constructing each air muscle. Test to determine wall thickness.	Andrew
Electrical Communication Failure	Failure of all solenoids to release air to muscles.	Extreme movement of this robot could loosen wires. Landing may also cause strong enough impulses to disconnect electrical circuits.	4	2	8	Make sure electrical connections are secure.	Phil
Poor Documentation	Dissatisfied customer. Follow up projects would be hindered	Poor documentation throughout design and testing process.	2	3	6	Continually update website and svn folder.	Group
On Board Power Supply	Failure of electronics to operate.	Not enough power supplied from on board.	2	3	6	Test power supply with sprinkler valves.	Phil

Dimension Related Muscle Interference	Muscles cannot expand fully causing less than full utilization of muscle potential	Poor layout planning. Inadequate attention paid to design around muscles.	2	3	6	Trail and error with prototype to account for muscle fill related size changes.	Trevor
Malfunction of Air Muscle Cables	Binding or stretching of cables. Improper transmission of muscle force.	Improper cable material selection. Poor design/placement of cable paths.	2	2	4	Carefully design cable pathways and be aware of binding possibility during testing.	Trevor
Material Failure	Material yielding leading to failed operation.	Poor material selection/design.	2	2	4	Consider landing stresses. Implement shock absorbing landing equipment.	Andrew
Over Weight Robot (excluding tank)	Unable to use current muscles to lift off the ground.	Various heavy parts on the robot including it's frame.	2	2	4	Machine excess material off of all parts.	Trevor
Group Dysfunction	Divergent design ideas.	Poor communication and decision protocol.	1	2	2	Build a decisions making system.	Group