

Problem Statement

Our goal with this project was to be able to deploy a certain area of flexible solar panels with a system that would also be as compact and lightweight as possible when retracted. The boom is only one aspect of the project however. We also had to design the controls for it. This involved even deciding whether or not we wanted to use analog or digital controls. After weighting the pros and cons of each, we decided on using a digital PLC due to its greater durability and flexibility. This means that we had to figure out how many inputs and outputs we would have on the system so that we could design the software needed to run the PLC. By making a truth table with all the possible outcomes and what should be done when they arise we've done just that, and now the boom can report its position and any errors to the computer while it's in use.

Deliverables

First Semester

- Research Low Earth Orbit space
- Communication in a vacuum
- Begin design ideas
- Know the basic outline of the circuit we wish to build
- Keep track of ways to improve
- Final circuit completed
- Know what materials would be needed
- Order materials
- Have built materials and circuit design sent to NASA

Second Semester

- Have the circuit assembled
- Minor testing of circuit completed
- Make necessary changes
- Have circuit shipped to NASA
- Start boom design and mechanical aspects

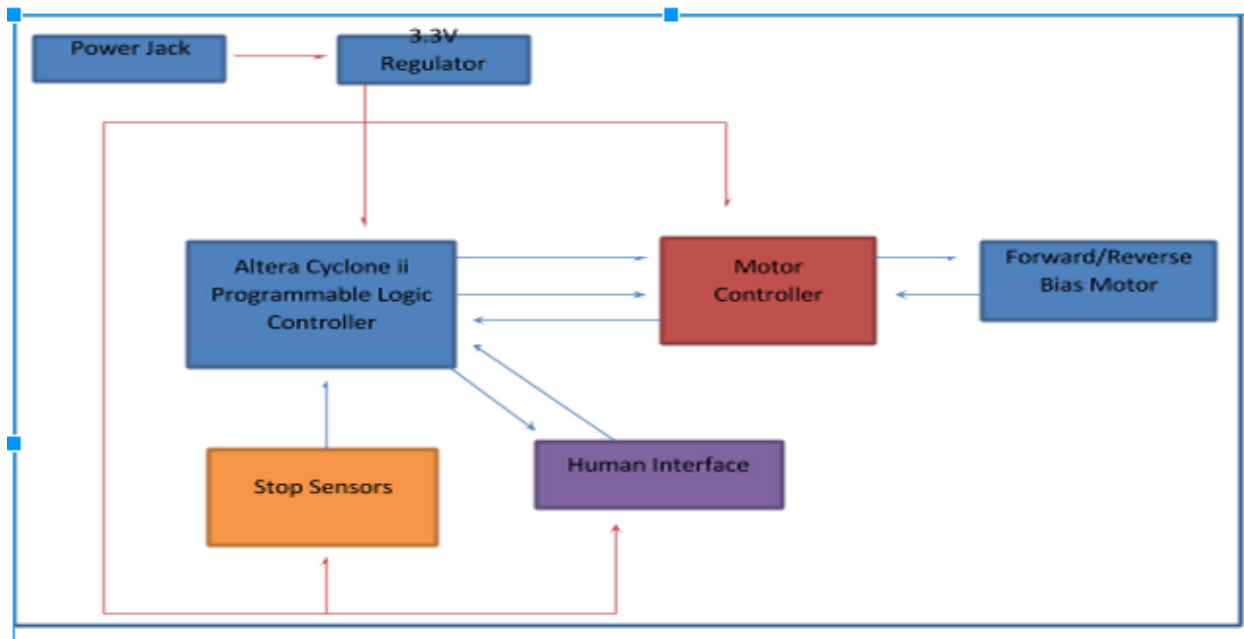
Specifications:

Working Scissor Boom



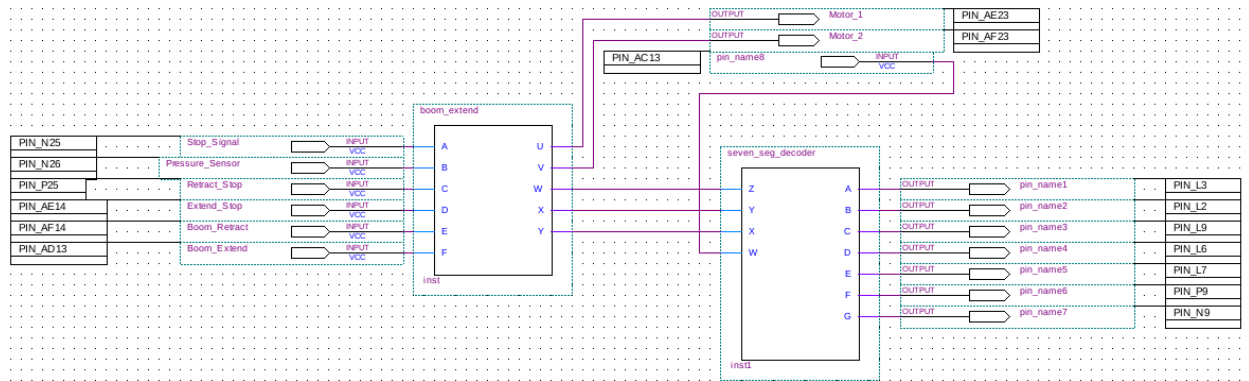
Overall model interface:

- Motor
- Motor Driver
- PLC
- Sensors



In our design we are using an Altera Cyclone II Programmable Logic Controller which will:

- Conduct all of the logic processes
- Accept inputs from sensors to determine the state of the system
- Send/Receive information to the end user to make further decisions
- Send start/stop signal to the motor controller



Schedule

These are the following due dates that we have chosen for major steps in our senior design project.

Due Date	Tasks	Team Assignment
Oct-5-14	Wired filters or PLC	
	Design Simplicity	Luke/Dustin
	Size(mass)	Luke/Dustin
	Cost	Tom/Isaac
	Reliability	Tom/Isaac
	Fabrication	Antjuan/Ryan/Anh
	Implimentation	h
	Testing	Antjuan/Ryan/Anh
Oct-31-14	Circuit Outline/Improvements	Team
Nov-14-14	Final Circuit Completion	Team
	Material Selections	Anh
	Bill of Materials (BOM)	Team
Nov-20-14	Material Ordering	Team
Dec-12-14	Draft Design and BOM send to NASA	Team
Jan-30-15	Circuit Assembled	Team
Feb-6-15	On surface Testing	Team
Feb-20-15	Testing Completion	Team
	Ship Circuit to NASA	Team
	Boom Design	Team