



# Active Suspension System Test Platform

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# Outline

- Project Summary
- Previous Work
- Functional Description
- Block Diagrams
- Inputs and Outputs
- Subsystems
- Software Flowchart
- Motor Model
- Parts List
- Work Schedule
- Questions?



# Project Summary

- **Drive a platform load with a 115[VDC] motor**
- **Microcontroller based feedback control system**
- **User selects starting position and waveform**
- **Optional analog position input**



# Previous Work

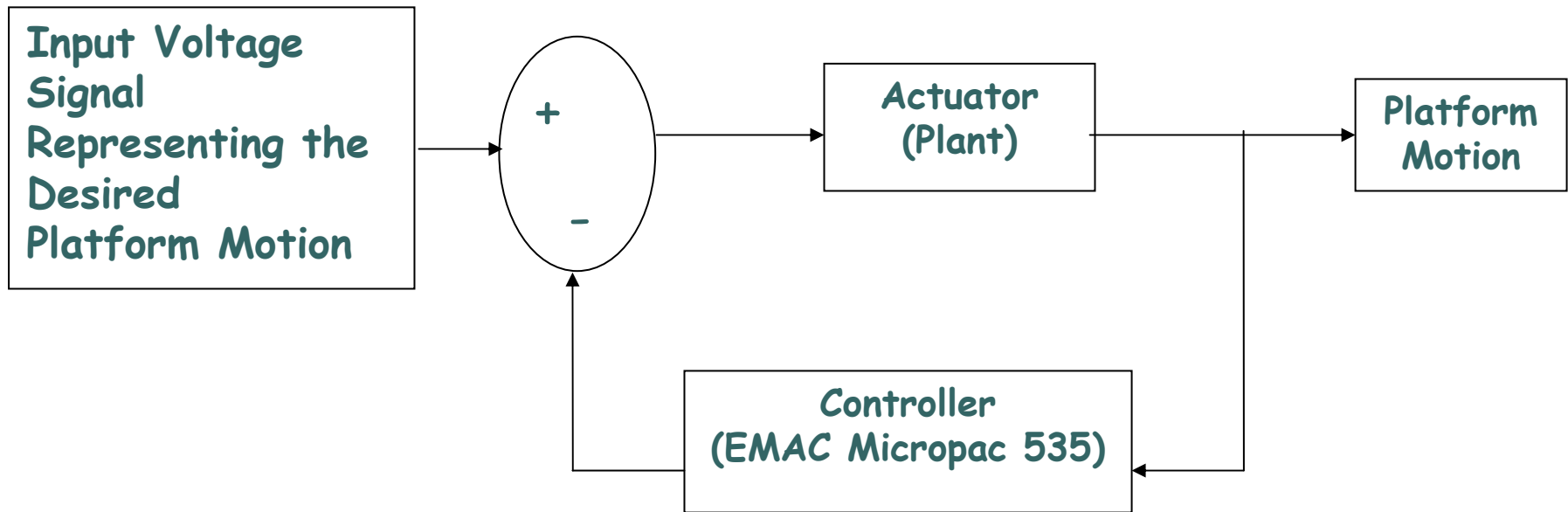
- Linear Actuator
- Power electronics calculations
- Plant Model for Linear Actuator
- System responds with different waveform types
- Bidirectional movement of platform loads

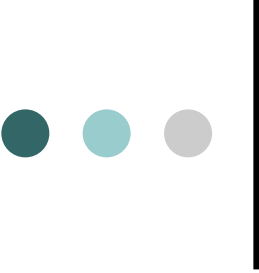


# Functional Description

- Responds to a platform load via feedback system
- The mode of operation will be determined by the user via a keypad on the micro-controller.
  - Sinusoidal
  - Step
  - Triangular
  - Ramp
- Flexibility in selecting desired frequency and amplitude of the platform's motion

# Control Block Diagram





# Inputs & Outputs

## System

INPUTS	OUTPUTS
Desired platform motion	Platform movement

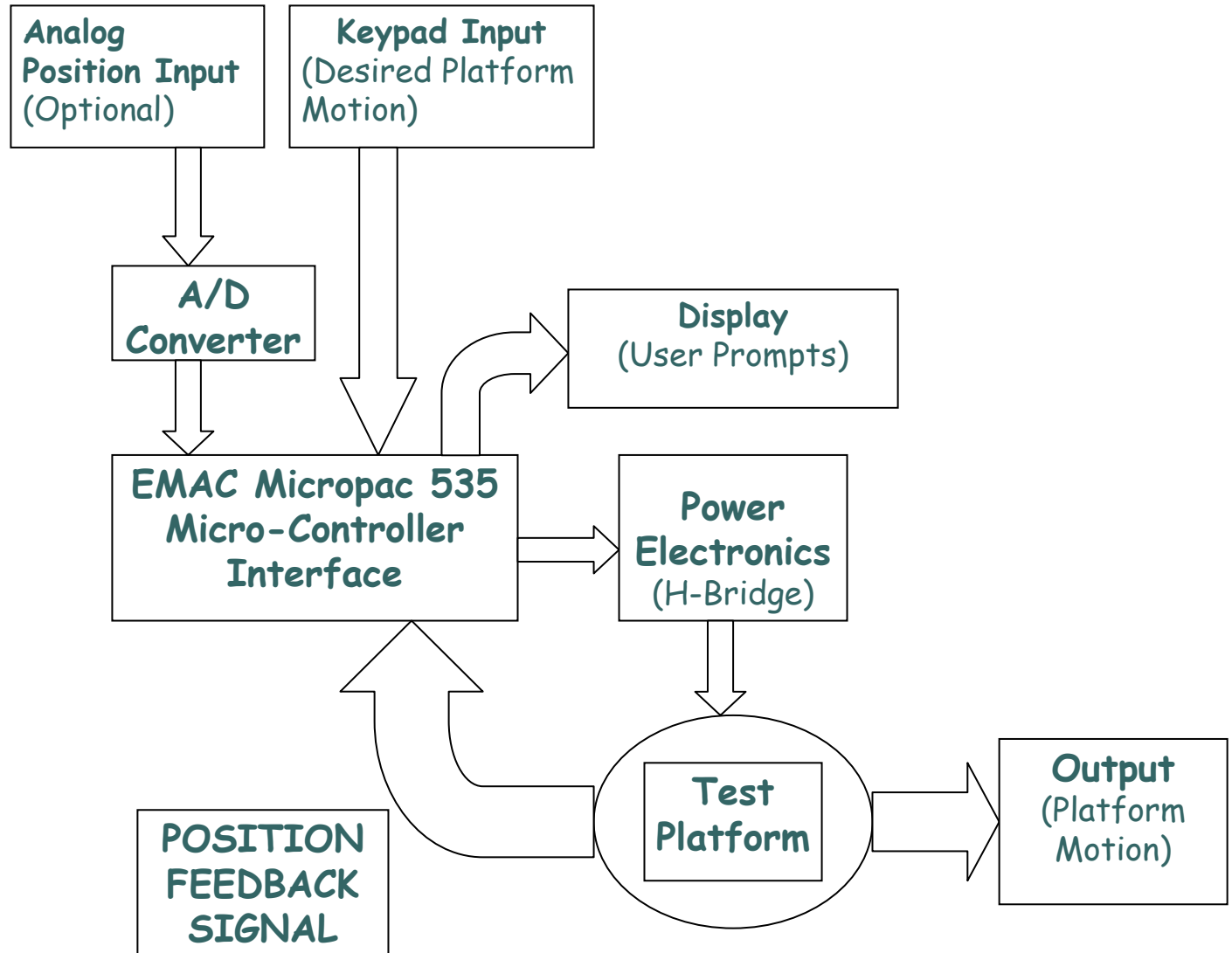
## EMAC Micropac 535 micro-controller

INPUTS	OUTPUTS
Keypad	Platform movement
Waveform Generator	LCD Display
Feedback Sensor	

## Actuator

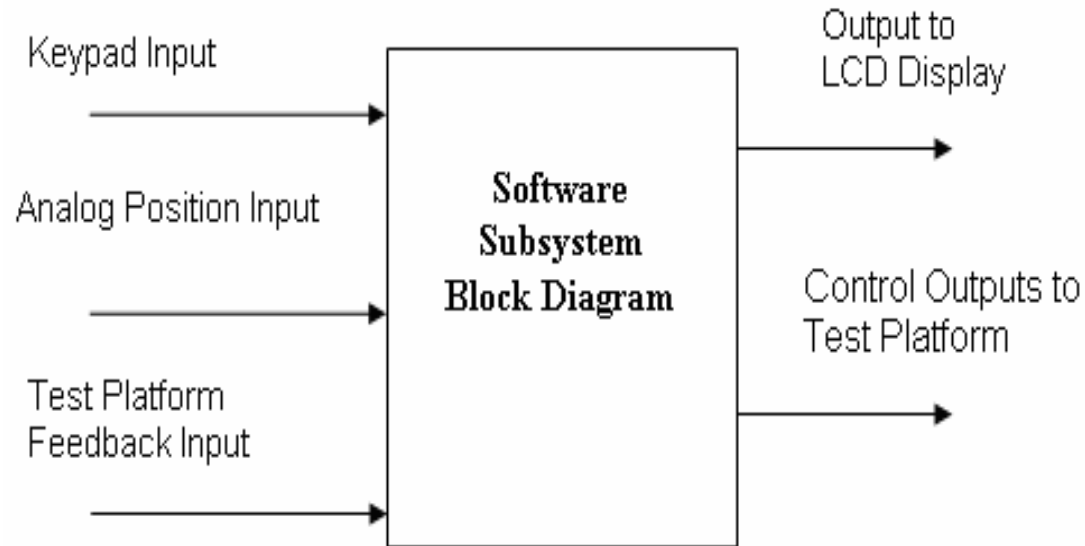
INPUTS	OUTPUTS
Error signal from controller	Platform movement

# System Block Diagram



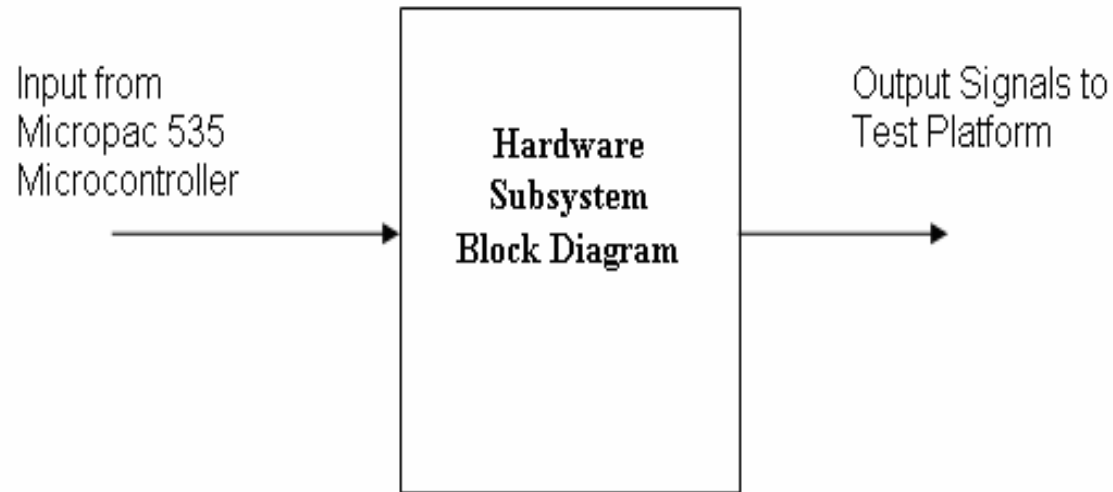


# Software Subsystem

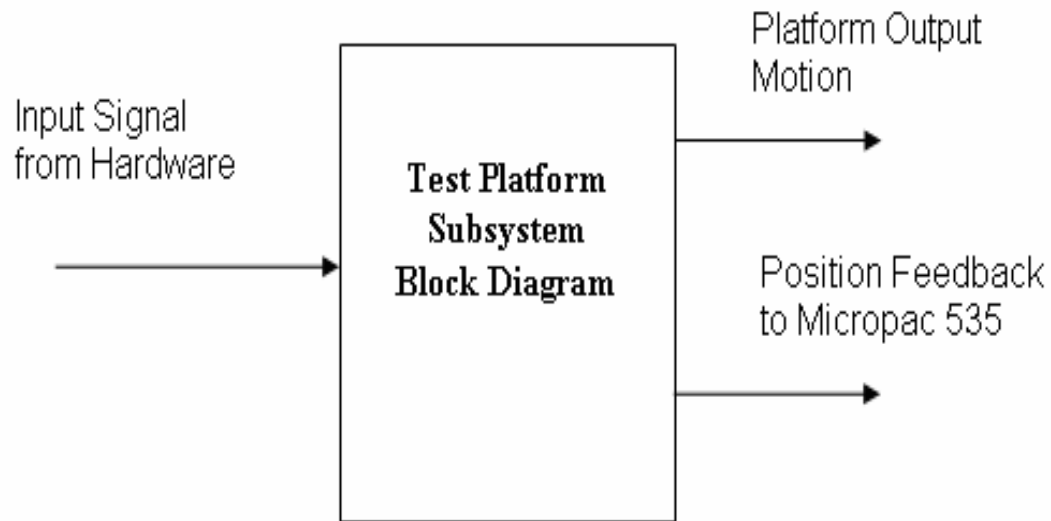




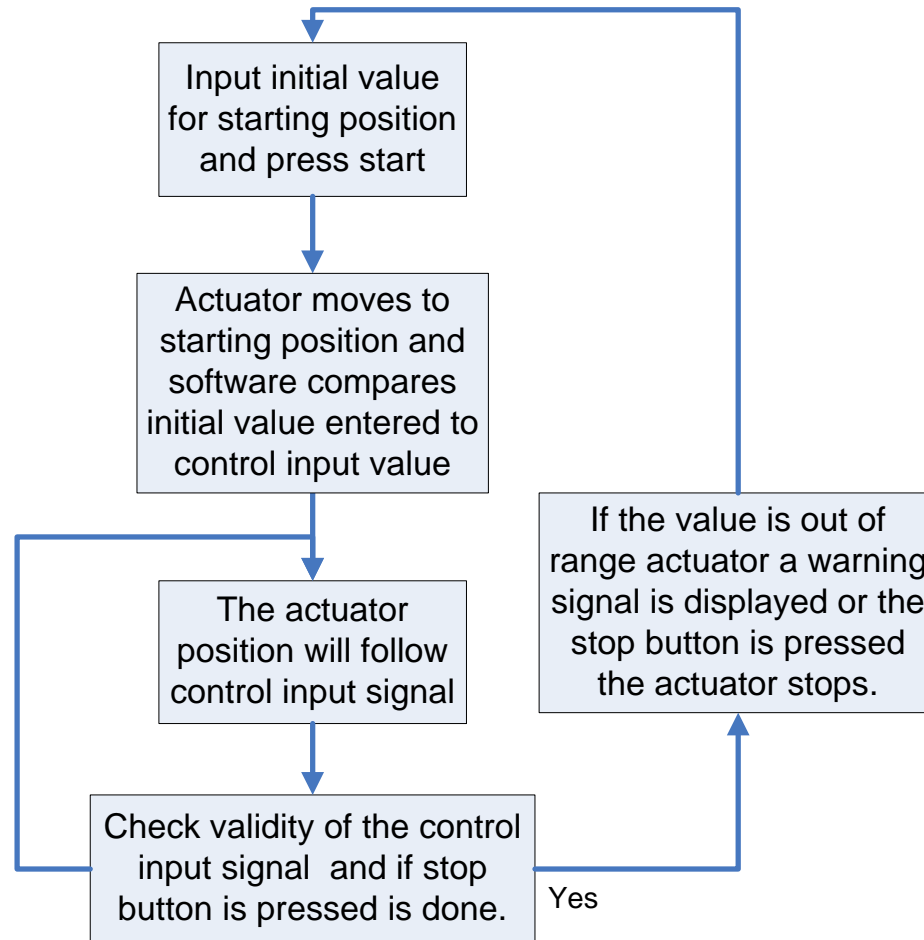
# Hardware Subsystem



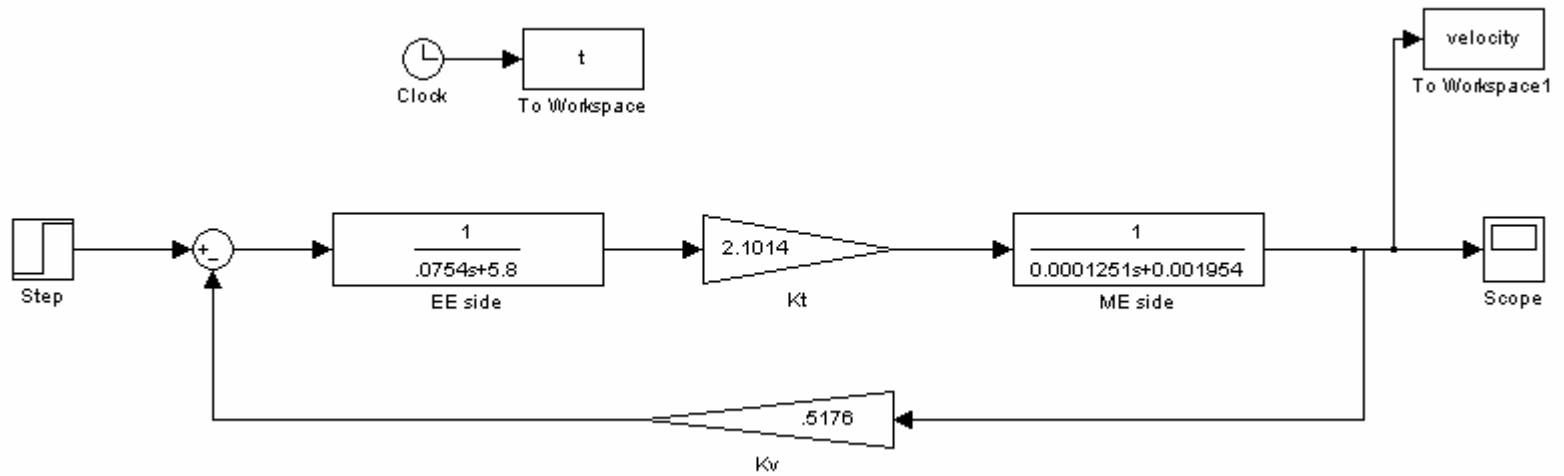
# Test Platform Subsystem



# Software Flow Chart



# Motor Model





# Parts List

- Micro Pac 535
- 115 [VDC] Motor
- H-Bridge
- Screw Jack



# Work Schedule

## Fall Semester

- ACTIVEST Project Research
- 115 [VDC] Motor Modeling

## Spring Semester

- Week 1-2 Software Design
- Week 3-4 Software Coding and Platform Construction
- Week 5-7 Software Debugging and Testing
- Week 8-10 System Integration of Hardware and Software Subsystems
- Week 11-13 Research on project expansion and senior presentation preparation



# Questions