

Active Suspension System Test Platform

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Submitted To:

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Senior Capstone Project

November 15, 2005

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System Level Block Diagram

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Introduction:

Building an active suspension system test platform has been the topic of at least two prior senior projects. This year the project will build upon prior research, and will ultimately use a 1/3 hp dc motor to drive the test platform. Prior year's projects have yielded designs with significantly less driving power.

Our control system will use the EMAC Inc. Micropac 535 Development board to obtain user input as well as to provide control signals and timing to the power electronics. The existing power electronics may or may not be able to drive the motor provided to us this year and thus everything will need to be examined in addition to creating an accurate model of the 1/3 hp motor.

Block Diagram:

Following Subsections Refer to Figure 2-2

EMAC Inc. Development Board Inputs:

Using the keypad will allow the user to select one of the internal pre-calculated output waveforms. If an external signal source is connected to the development board, specific waveforms and or a specific location for the output platform can be selected.

Power Electronic Outputs:

The output of the EMAC Inc. development board will control the power electronics. Appropriate power electronics that can handle 115[VDC] will need to be chosen to drive the motor. The ultimate output of the system will be the user selected movement of the test platform which will include Step, Sinusoidal, and Triangular waveforms. Prior years' overall block diagram as well as table of inputs/ outputs are shown as the overall goals have not changed.

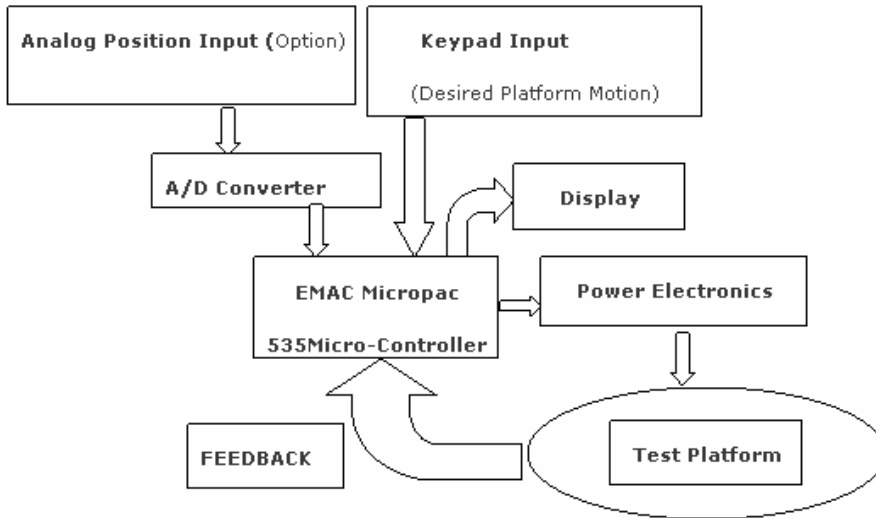


Figure 2-1: System Block Diagram

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

Figure 2-2: Overall Input / Output of system.

Software:

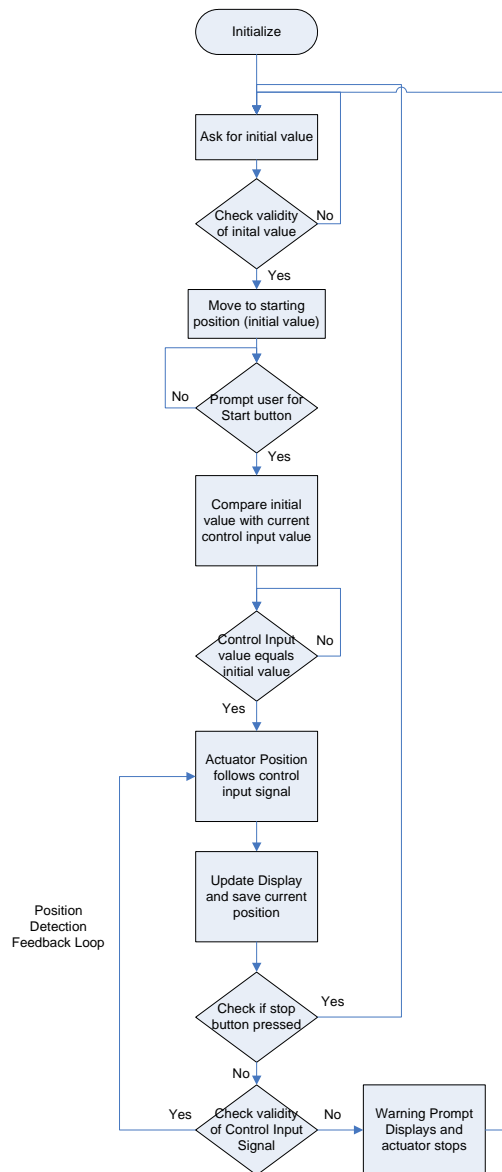


Figure 3-1: Software Flow Chart

After initialization, the LCD prompts the user to input the initial value for the position of the platform to start at using the keypad. Once the platform has moved to the starting position the LCD will prompt the user to press start. After the start button has been pressed the actuator position will follow the control input signal as long as the value of the signal is within the limit of the actuator. If the value of the control signal isn't within the limit, the actuator will stop and the LCD will display a warning prompt. Also at anytime the stop button can be pressed to stop the operation. The position of the actuator will be saved and displayed on the LCD every time it moves.