Project Progress Report

Implementation of Conventional and Neural Controllers Using Position and Velocity Feedback

Week Ending: January 31, 2000

By:
Chris Spevacek and Manfred Meissner

Advisor:
Dr. Gary Dempsey
Signature:_____

Objective

For this week, our objective was to create the help menu for the program supplied by Quansar Consulting to run the robot system. We also wanted to start the system identification of the robot arm system.

Progress

Help Menu

A help menu was added to the software provided by Quansar Consulting to be used with the robot arm system. The reason for adding the help screen was to make the software easier to use and save space on the main screen. Some commands were not shown on the original screen. For example, if the 'z' key is hit it zeros out the measurements. To get to the help screen simply hit the 'h' key on the keyboard. On the main screen a line was added to show the user this command, this is shown in Fig. 1. When the key is hit the help screen pops up showing all of the commands the program uses, this screen is shown in Fig. 2. While on this screen none of the other features work. For example, the motor can not turn on or off while in the help screen. To exit the help screen the 'x' key is hit and it brings back the main screen. Also added, was a line on the real time plotting screen to say how to exit, this screen is shown in Fig. 3.

System Identification

The robot arm system is new and the transfer function is not known. To find the transfer function of the level robot arm it was assumed that there are only three poles and no zeros. So the pole locations have to be found. The third pole will be at a high frequency so it will not be able to be found because of the limitations on the motor. To find the first pole we put in a step function. The output of the robot arm system was a

ramp function, which told us that there is a pole at the origin. Since, the ramp function is the integration of the of the step function. The next step is to find the time delay of the system. We used the same input signal, step function, and output signal, ramp function, and displayed them on the oscilloscope. The time delay is the difference in time between the falling edge of the input signal and the falling edge of the output signal. We found the time delay in the positive direction to be approximately 14 milliseconds. The negative direction still had to be found.

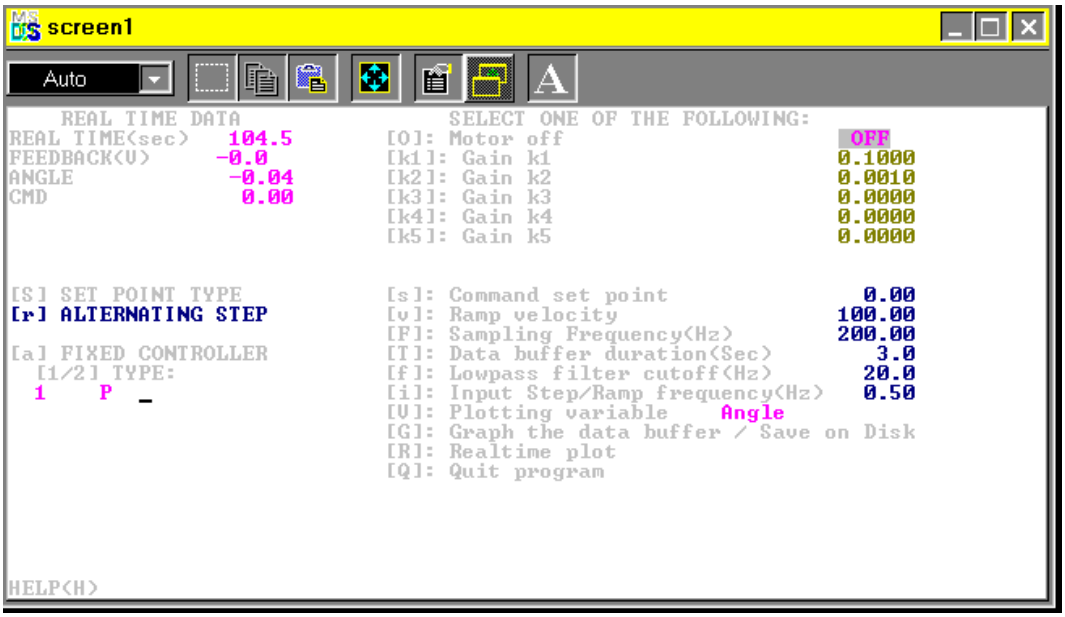

Fig 1. Main Screen

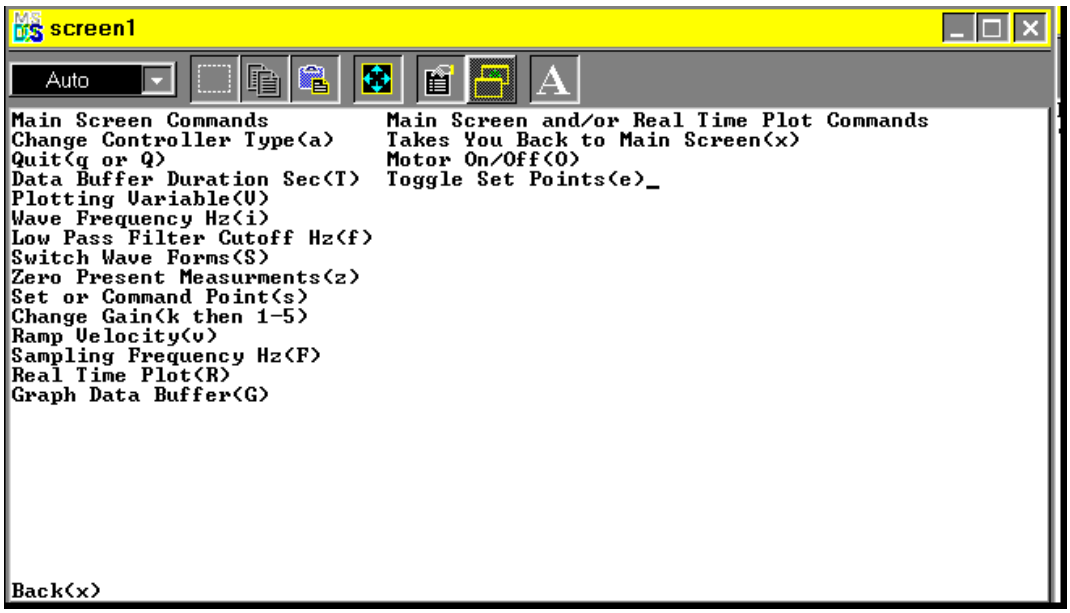

Fig. 2. Help Screen

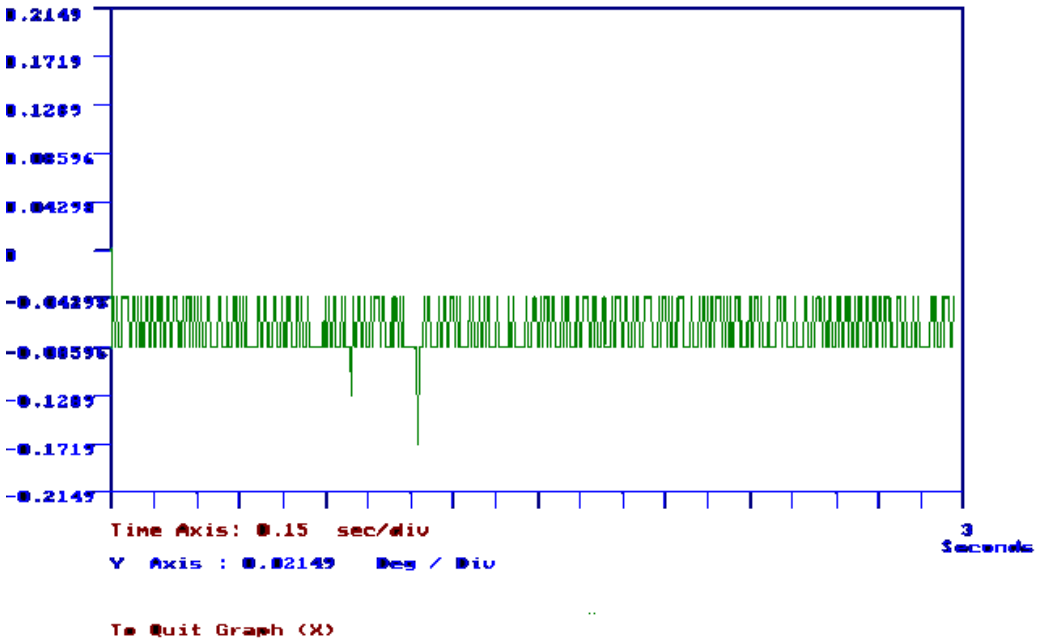

Fig. 3. Real time Plot